

362
ECONOMIC EFFECT OF VIETNAM SPENDING

HEARINGS
BEFORE THE
JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES
NINETIETH CONGRESS
FIRST SESSION

Volume II

**The Military Impact on the American Economy:
Now and After Vietnam**

**A Compendium of Statements, Articles, and Papers
Compiled as Background Material**



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THE MILITARY IMPACT ON THE AMERICAN ECONOMY: NOW AND AFTER VIETNAM

A COMPENDIUM OF STATEMENTS, ARTICLES, AND PAPERS

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Part I

THE MILITARY PROGRAM OF THE UNITED STATES

This section consists of official statements of Secretary of Defense Robert S. McNamara on defense programs and budgets.

**STATEMENT OF SECRETARY OF DEFENSE
ROBERT S. McNAMARA**

(Before the Subcommittee on Department of Defense Appropriations of the Senate Committee on Appropriations (amendment to the fiscal year 1966 defense budget), August 4, 1965)

Mr. Chairman, members of the committee, last Wednesday President Johnson informed the Nation of the mounting Communist aggression in South Vietnam and the additional measures which we plan to take to assist the people of that country in defending their freedom and independence. We are here today to report on that situation, to review with you the additional military actions involved, and to request the funds required to finance these actions pending the submission of a detailed fiscal year 1966 supplemental request to the Congress when it convenes in January.

Although Vietnam is now the focus of attention, we are not overlooking the possibility that trouble may arise in other areas of the world, perhaps as a reaction to our increased effort in that country or for other reasons. Accordingly, in planning for the increased deployment of U.S. forces to southeast Asia, we have also taken into account the forces which may be needed to meet contingencies elsewhere. Although we have no basis to assume at this time that the Soviet Union or Communist China would deliberately provoke new crises in other areas, prudence dictates that we be prepared for such emergencies.

The issue in Vietnam is essentially the same as it was in 1954 when President Eisenhower said:

I think it is no longer necessary to enter into a long argument or exposition to show the importance to the United States of Indochina and of the struggle going on there. No matter how the struggle may have started, it has long since become one of the testing places between a free form of government and dictatorship. Its outcome is going to have the greatest significance for us, and possibly for a long time into the future.

We have here a sort of cork in the bottle, the bottle being the great area that includes Indonesia, Burma, Thailand, all of the surrounding areas of Asia with its hundreds of millions of people * * *

What is at stake there is the ability of the free world to block Communist armed aggression and prevent the loss of all of southeast Asia, a loss which in its ultimate consequences could drastically alter the strategic situation in Asia and the Pacific to the grave detriment of our own security and that of our Allies. While 15 years ago, in Korea, Communist aggression took the form of an overt armed attack, today in South Vietnam it has taken the form of a large scale intensive guerrilla operation. The covert nature of this aggression, which characterized the earlier years of the struggle in South Vietnam, has now all but been stripped away. The control of the Vietcong effort by the regime in Hanoi, supported and incited by Communist China, has become increasingly apparent.

The struggle there has enormous implications for the security of the United States and the free world, and for that matter, the Soviet Union as well. The North Vietnamese and the Chinese Communists have chosen to make South Vietnam the test case for their particular version of the so-called wars of national liberation. The extent to which violence should be used in overthrowing non-Communist governments has been one of the most bitterly contested issues between the Chinese and the Soviet Communists. Although the former Chairman, Mr. Khrushchev, fully endorsed wars of national liberation as the preferred means of extending the sway of communism, he cautioned that "this does not necessarily mean that the transition to socialism will everywhere and in all cases be linked with armed uprising and civil war. * * * Revolution by peaceful means accords with the interests of the working class and the masses."

The Chinese Communists, however, insist that:

Peaceful coexistence cannot replace the revolutionary struggles of the people. The transition from capitalism to socialism in any country can only be brought about through proletarian revolution and the dictatorship of the proletariat in that country. * * * The vanguard of the proletariat will remain unconquerable in all circumstances only if it masters all forms of struggle—peaceful and armed, open and secret, legal and illegal, parliamentary struggle and mass struggle, and so forth. (Letter to the Central Committee of the Communist Party of the Soviet Union, June 14, 1963.)

Their preference for violence was even more emphatically expressed in an article in *The Peking Peoples Daily* of March 31, 1964:

It is advantageous from the point of view of tactics to refer to the desire for peaceful transition, but it would be inappropriate to emphasize the possibility of peaceful transition. * * * the proletarian party must never substitute parliamentary struggle for proletarian revolution or entertain the illusion that the transition to socialism can be achieved through the parliamentary road. Violent revolution is a universal law of proletarian revolution. To realize the transition to socialism, the proletariat must wage armed struggle, smash the old state machine and establish the dictatorship of the proletariat * * *

"Political power," the article quotes Mao Tse-tung as saying, "grows out of the barrel of a gun."

Throughout the world we see the fruits of these policies and in Vietnam, particularly, we see the effects of the Chinese Communists' more militant stance and their hatred of the free world. They make no secret of the fact that Vietnam is the test case, and neither does the regime in Hanoi. General Giap, head of the North Vietnamese Army, recently said that "South Vietnam is the model of the national liberation movement of our time. * * * If the special warfare that the U.S. imperialists are testing in South Vietnam is overcome, then it can be defeated everywhere in the world." And, Pham Van Dong, Premier of North Vietnam, pointed out that "the experience of our compatriots in South Vietnam attracts the attention of the world, especially the peoples of South America."

It is clear, therefore, that a Communist success in South Vietnam would be taken as positive proof that the Chinese Communists' position is correct and they will have made a giant step forward in their efforts to seize control of the world Communist movement. Furthermore, such a success would greatly increase the prestige of Communist China among the nonaligned nations and strengthen the position of their followers everywhere. In that event we would then have to be prepared to cope with the same kind of aggression in other parts of

the world wherever the existing governments are weak and the social structures fragmented. If Communist armed aggression is not stopped in Vietnam, as it was in Korea, the confidence of small nations in America's pledge of support will be weakened and many of them, in widely separated areas of the world, will feel unsafe.

Thus, the stakes in South Vietnam are far greater than the loss of one small country to communism. Its loss would be a most serious setback to the cause of freedom and would greatly complicate the task of preventing the further spread of militant Asian communism. And, if that spread is not halted, our strategic position in the world will be weakened and our national security directly endangered.

It was in recognition of this fundamental issue that the United States, under three Presidents, firmly committed itself to help the people of South Vietnam defend their freedom. That is why President Eisenhower warned at the time of the Geneva Conference in July 1954 that "* * * any renewal of Communist aggression would be viewed by us as a matter of grave concern." That is why President Johnson in his statement last Wednesday made it clear to all the world that we are determined to stand by our commitment and provide whatever help is required to fulfill it.

CONDITIONS LEADING TO THE PRESENT SITUATION IN SOUTH VIETNAM

Essential to a proper understanding of the present situation in South Vietnam is a recognition of the fact that the so-called insurgency there is planned, directed, controlled, and supported from Hanoi. True, there is a small dissident minority in South Vietnam, but the Government could cope with it if it were not directed and supplied from the outside. As early as 1960, at the Third Congress of the North Vietnamese Communist Party, both Ho Chi Minh and Vo Nguyen Giap, the commander in chief of the North Vietnamese armed forces, spoke of the need to "step up" the "revolution in the South." In March 1963 the party organ *Hoc Tap* stated that the authorities in South Vietnam "are well aware that North Vietnam is the firm base for the southern revolution and the point on which it leans, and that our party is the steady and experienced vanguard unit of the working class and people and is the brain and factor that decides all victories of the revolution."

Yet through most of these years the North Vietnamese Government denied and went to great efforts to conceal the scale of its personnel and materiel support, in addition to direction and encouragement, to the Vietcong. It had strong reasons to do so.

First of all, in 1954 the authorities in Hanoi had pledged to "respect the territory under the military control of the other party"—South Vietnam—"and engage in no hostile act against the other party." In 1962 those same authorities pledged that they would "not use the territory of the Kingdom of Laos for interference in the internal affairs of other countries."

The North Vietnamese regime had no wish to force upon the attention of the world its massive and persistent violations of those pledges. Nor was it anxious for its own citizens to dwell upon the ultimate risks of committing, unequivocally, aggression across international

boundaries. Nor could the Vietcong cause be anything but harmed if it were to be recognized openly in the South as an instrument of the North Vietnamese regime.

However, in building up the Vietcong forces for a decisive challenge, the authorities in North Vietnam have increasingly dropped the disguises that gave their earlier support a clandestine character.

Through 1963, the bulk of the arms infiltrated from the North were old French and American models acquired prior to 1954 in Indochina and Korea. Now, the flow of weapons from North Vietnam consists almost entirely of the latest arms acquired from Communist China; and the flow is large enough to have entirely re-equipped the main force units, despite the capture this year by government forces of thousands of these weapons and millions of rounds of the new ammunition.

Likewise, through 1963, nearly all the personnel infiltrating through Laos, trained and equipped in the North and ordered South, were former Southerners. But in the last 18 months, the great majority of the infiltrators—more than 10,000 of them—have been ethnic Northerners, mostly draftees ordered into the People's Army of Vietnam for duty in the South. And it now appears that, starting their journey through Laos last December, from one to three regiments of a North Vietnamese regular division, the 325th Division of the North Vietnamese Army, have deployed into the Central Highlands of South Vietnam for combat alongside the Vietcong.

Thus, despite all its reasons for secrecy, Hanoi's desire for decisive results this summer has forced it to reveal its hand even more openly.

The United States during the last 4 years has steadily increased its help to the people of South Vietnam in an effort to counter this ever-increasing scale of Communist aggression. These efforts achieved some measure of success during 1962. The South Vietnamese forces in that year made good progress in suppressing the Vietcong insurrection. Although combat deaths suffered by these forces in 1962 rose by 11 percent over the 1961 level (from about 4,000 to 4,450), Vietcong combat deaths increased by 72 percent (from about 12,000 to 21,000). Weapons lost by the South Vietnamese fell from 5,900 in 1961 to 5,200 in 1962, while the number lost by the Vietcong rose from 2,750 to 4,050. The Government's new Strategic Hamlet program was just getting underway and was showing promise. The economy was growing and the Government seemed firmly in control. Therefore, when I appeared before this committee in early 1963, I was able to say:

* * * victory over the Vietcong will most likely take many years. But now, as a result of the operations of the last year, there is a new feeling of confidence, not only on the part of the Government of South Vietnam but also among the populace, that victory is possible.

But at the same time I also cautioned:

We are not unmindful of the fact that the pressures on South Vietnam may well continue through infiltration via the Laos corridor. Nor are we unmindful of the possibility that the Communists, sensing defeat in their covert efforts, might resort to overt aggression from North Vietnam. Obviously, this latter contingency could require a greater direct participation by the United States. The survival of an independent government in South Vietnam is so important to the security of all of southeast Asia and to the free world that we must be prepared to take all necessary measures within our capability to prevent a Communist victory.

Unfortunately, the caution voiced in early 1963 proved to be well founded. Late in 1963, the Communists stepped up their efforts and the military situation began to deteriorate. The Diem government came under increasing internal pressure and in November it was overthrown. A year ago last February, I had to tell this committee that:

The Vietcong was quick to take advantage of the growing opposition to the Diem government and the period of uncertainty following its overthrow. Vietcong activities were already increasing in September and continued to increase at an accelerated rate in October and November particularly in the Delta area. And I must report that they have made considerable progress since the coup.

Following the coup, the lack of stability in the central government and the rapid turnover of key personnel, particularly senior military commanders, began to be reflected in combat operations and throughout the entire fabric of the political and economic structure. And, in 1964 the Communists greatly increased the scope and tempo of their subversive efforts. Larger scale attacks became more frequent and the flow of men and supplies from the North expanded. The incidence of terrorism and sabotage rose rapidly and the pressure on the civilian population was intensified. The deteriorating military situation was clearly reflected in the statistics. South Vietnamese combat deaths rose from 5,650 in 1963 to 7,450 in 1964 and the number of weapons lost from 8,250 to 14,100. In contrast, Vietcong combat deaths dropped from 20,600 to 16,800 and, considering the stepped-up tempo of activity, they experienced only a very modest rise in the rate of weapons lost (from 5,400 to 5,900).

At various times in recent months, I have called attention to the continued buildup of Communist forces in South Vietnam. I pointed out that although these forces had not been committed to combat in any significant degree, they probably would be after the start of the monsoon season. It is now clear that these forces are being committed in increasing numbers and that the Communists have decided to make an all-out attempt to bring down the Government of South Vietnam. The entire economic and social structure is under attack. Bridges, railroads, and highways are being destroyed and interdicted. Agricultural products are being barred from the cities. Electric powerplants and communication lines are being sabotaged. Whole villages are being burned and their population driven away, increasing the refugee burden on the South Vietnamese Government.

As I mentioned, in addition to the continued infiltration of increasing numbers of individuals and the acceleration of the flow of modern equipment and supplies, organized units of the North Vietnamese army have been identified in South Vietnam. We now estimate the hard-core Vietcong strength at some 70,000 men, including a recently reported increase in the number of combat battalions. In addition, they have some 90,000 to 100,000 irregulars and some 30,000 in their political cadres, i.e., tax collectors, propagandists, etc. We have also identified at least three battalions of the regular North Vietnamese Army, and there are probably considerably more. At the same time the Government of South Vietnam has found it increasingly difficult to make a commensurate increase in the size of its own forces, which now stand at about 545,000 men, including the regional and local defense forces but excluding the national police.

Combat deaths on both sides have been mounting—for the South Vietnamese from an average of 143 men a week in 1964 to about 270

a week for the 4-week period ending July 24 this year. Vietcong losses have gone from 322 a week last year to about 680 a week for the 4-week period ending July 24. Most important, the ratio of South Vietnamese to Vietcong strength has seriously declined in the last 6 or 7 months from about 5 to 1 to about 3 or $3\frac{1}{2}$ to 1; the ratio of combat battalions is substantially less. This is far too low a ratio for a guerrilla war even though the greater mobility and firepower provided to the South Vietnamese forces by the United States help to offset that disadvantage. The South Vietnamese forces have to defend hundreds of cities, towns, and hamlets while the Vietcong are free to choose the time and place of their attack. As a result, the South Vietnamese forces are stretched thin in defensive positions, leaving only a small central reserve for offensive action against the Vietcong, while the latter are left free to concentrate their forces and throw them against selected targets. It is not surprising, therefore, that the Vietcong retains most of the initiative.

Even so, we may not as yet have seen the full weight of the Communist attack. Presently, the situation is particularly acute in the northern part of the country where the Communists have mobilized large military forces which pose a threat to the entire region and its major cities and towns. Our air attacks may have helped to keep these forces off balance but the threat remains and it is very real.

Clearly, the time has come when the people of South Vietnam need more help from us and other nations if they are to retain their freedom and independence. We have already responded to that need with some 75,000 U.S. military personnel, including some combat units. This number will be raised to 125,000 almost immediately with the deployment of the Air Mobile Division and certain other forces. But, more help will be needed in the months ahead and additional U.S. combat forces will be required to back up the hard pressed Army of South Vietnam. Two other nations have provided combat forces—Australia and New Zealand. We hope that by the end of this year others will join them.

ROLE OF U.S. COMBAT FORCES IN SOUTH VIETNAM

As I noted earlier, the central reserve of the South Vietnamese Army has been seriously depleted in recent months. The principal role of U.S. ground combat forces will be to supplement this reserve in support of the front line forces of the South Vietnamese Army. The indigenous paramilitary forces will deal with the pacification of areas cleared of organized Vietcong and North Vietnamese units, a role more appropriated for them than for our forces.

The Government of South Vietnam's strategy, with which we concur, is to achieve the initiative, to expand gradually its area of control by breaking up major concentrations of enemy forces, using to the maximum our preponderance of air power, both land and sea based. The number of "fixed-wing" attack sorties by U.S. aircraft in South Vietnam will increase manyfold by the end of the year. Armed helicopter sorties will also increase dramatically over the same period, and extensive use will be made of heavy artillery, both land based and sea based. At the same time our air and naval forces will continue to interdict the Vietcong supply lines from North Vietnam, both land and sea.

Although our tactics have changed, our objective remains the same. We have no desire to widen the war. We have no desire to overthrow the North Vietnamese regime, seize its territory, or achieve the unification of North and South Vietnam by force of arms. We have no need for permanent military bases in South Vietnam or for special privileges of any kind. What we are seeking through the planned military buildup is to block the Vietcong offensive, to give the people of South Vietnam and their armed forces some relief from the unrelenting Communist pressures—to give them time to strengthen their government, to reestablish law and order, and to revive their economic life which has been seriously disrupted by Vietcong harassment and attack in recent months. We have no illusions that success will be achieved quickly, but we are confident that it will be achieved much more surely by the plan I have outlined.

INCREASES IN U.S. MILITARY FORCES SINCE 1961

Fortunately, we have greatly increased the strength and readiness of our Military Establishment since 1961, particularly in the kinds of forces which we now require in southeast Asia. The Active Army has been expanded from 11 to 16 combat-ready divisions; 20,000 men have been added to the Marine Corps to allow them to fill out their combat structure and at the same time facilitate the mobilization of the Marine Corps Reserve. The tactical fighter squadrons of the Air Force have been increased by 51 percent. Our airlift capability has more than doubled. Special Forces trained to deal with insurgency threats have been multiplied elevenfold. General ship construction and conversion has been doubled.

During this same period, procurement for the expanded force has been increased greatly: Air Force Tactical aircraft from \$360 million in 1961 to about \$1.1 billion in the original fiscal year 1966 budget; Navy aircraft—from \$1.8 billion to \$2.2 billion; Army helicopters—from 286 aircraft to over 1,000. Procurement of ordnance, vehicles and related equipment was increased about 150 percent in the fiscal year 1962-64 period, compared with the preceding 3 years. The tonnage of modern nonnuclear air-to-ground ordnance in stock tripled between fiscal year 1961 and fiscal year 1965. In brief, the Military Establishment of the United States, today, is in far better shape than it ever has been in peacetime to face whatever tasks may lie ahead.

Nevertheless, some further increases in forces, military personnel, production and construction will be required if we are to deploy additional forces to southeast Asia and provide for combat consumption while at the same time maintaining our capabilities to deal with crises elsewhere in the world.

FURTHER INCREASES IN THE FORCE STRUCTURE AND MILITARY PERSONNEL

To offset the deployments now planned to southeast Asia, and provide some additional forces for possible new deployments, we propose to increase the presently authorized force levels. These increases will be of three types: (1) additional units for the Active Forces, over and above those reflected in the January budget; (2) military personnel

augmentations for presently authorized units in the Active Forces to man new bases, to handle the larger logistics workload, etc.; and (3) additional personnel and extra training for selected Reserve component units to increase their readiness for quick deployment. We believe we can achieve this buildup without calling up the Reserves or ordering the involuntary extension of tours, except as already authorized by law for the Department of the Navy. Even here the extension of officer tours will be on a selective basis and extensions for enlisted men will be limited, in general, to not more than 4 months.

Our present estimate of the numbers of military personnel involved are shown on the table following this statement.

1. INCREASE IN ARMY FORCES

For the Army, we plan to activate one division force, three brigade forces, a large number of helicopter companies, and their combat service support units. In addition, we plan to replace the military personnel drawn from the Strategic Army Forces to provide logistic support in Vietnam. The buildup of these forces will require a substantial expansion of the Army training establishment. The larger deployments to South Vietnam and the increase in Army military personnel generally will result in a higher number of men in transit and other support activities. A military personnel strength increase in the Army of 235,000 is provided for these purposes.

2. AUGMENTATION OF THE THREE MARINE CORPS DIVISION/AIRCRAFT WINGS

Some 30,000 additional military personnel have been provided for the Marine Corps to augment existing units and to activate certain new units, such as helicopter squadrons, and communication, engineer, and military police battalions, and to provide for the increased training and manpower pipeline requirements.

3. STRENGTHENING THE NAVAL FORCES

The increased tempo of attack carrier operations and the intensified coastal patrol off Vietnam will require a small increase in the number of active ships in the Navy as well as an increase in the manning of the ships deployed to that area. These ships are required to operate at close to wartime tempos and therefore require higher manning levels than normally provided other fleet units. Furthermore, additional Navy personnel are needed to operate the new ports now being built in South Vietnam and to support the heavier logistics load at other bases. Other support activities, including pipeline, account for the balance of 35,000 additional personnel provided for the Navy.

4. AUGMENTATION OF THE AIR FORCE STRIKE AND AIRLIFT CAPABILITIES

In addition to the increased number of tactical attack sorties, we are also planning more B-52 sorties from Guam. To support the B-52 aircraft to be utilized for this mission, additional personnel will be needed at Guam, to handle ammunition, increased maintenance, and so forth. Support of the additional tactical fighter and troop carrier squadrons deployed to southeast Asia will require more men.

With the greatly increased flow of traffic to South Vietnam, a further early increase in our airlift capability is indicated. We plan to approximately double our existing capability for sustained operations through higher rates of utilization of present airlift aircraft. The more modern MATS aircraft, which now have a planned utilization rate of 5 hours per day, will be raised and held at 8 hours per day. The C-130E troop carrier aircraft in Tactical Air Command and in the Pacific, which now have a planned operating rate of 1½ hours per day, will be raised and held at 5 hours per day. More personnel will be needed.

The increase in the number of Air Force military personnel will require an expansion of the training establishment, which together with other support activities, principally the logistics base, will require a total increase in the Air Force end fiscal year 1966 military personnel strength of 40,000.

In total, 340,000 military personnel will be added to the active forces. To provide this additional strength, the current draft call rate of about 17,000 per month will be approximately doubled.

5. INCREASED READINESS FOR THE RESERVE COMPONENTS

As I noted earlier, we must be prepared to deploy additional forces to southeast Asia over and above those now planned. Furthermore, we must also be prepared to deal with crises elsewhere in the world. Accordingly, steps should be taken now to raise still further the readiness of selected Reserve component forces so that they could be quickly deployed if the need should arise.

There are a number of steps which could be taken towards this end. The units could be manned at full strength, the number and duration of the paid drills could be increased, additional tours of active duty for training could be provided, the equipment required for movement could be identified and earmarked, etc.

Shown on the table are the selected Reserve component forces whose readiness we believe should be raised over the next few months. The Army forces (three divisions and six brigades) will require additional personnel to raise their manning to the desired levels. These personnel can be obtained by enlisting additional men from civilian life or by reassigning men from Reserve units for which there is no military requirement.

The required increase in Reserve Force readiness could be greatly facilitated by the realignment of Reserve Forces which we proposed in the fiscal year 1966 budget. The realignment would permit us to concentrate men, equipment, and civilian technicians in the units we need for our contingency plans, instead of spreading them over a large number of units for which there is no military requirement. This was the primary objective of our realignment proposal and the events of the last few months have demonstrated the soundness of that objective. In my judgment, the realignment should go forward without further delay.

For the Marine Corps Reserve, we propose to add 2,500 paid drill training spaces to raise the manning of the 4th Division/Aircraft Wing (nine battalions and nine attack/fighter squadrons).

About 4,000 additional paid drill spaces will be provided to the Air Force Reserve components to raise the manning of nine fighter

squadrons, four tactical reconnaissance squadrons and 11 airlift squadrons to full authorized strength. We expect that all of these units will be ready to deploy on 24-hour notice by the end of this calendar year.

6. OTHER MILITARY PERSONNEL AND OPERATION AND MAINTENANCE COSTS

Over and above the costs of the additional military personnel, there will also be increased costs for the operation of installations and facilities in southeast Asia; the increases in flying and steaming hours; the consumption of spares and repair parts; and the transportation of supplies and equipment to southeast Asia. An increase of almost 36,000 "direct hire" civilian employees, raising the total at end fiscal year 1966 to just short of 1 million, will also be required.

None of these personnel and operation and maintenance costs can be estimated with any degree of precision at the present time. We have yet to work out detailed personnel plans and to calculate, on a phased basis, the increases in activity rates, movements of troops and materiel and other operation and maintenance costs associated with the buildup in southeast Asia. However, by the time we appear here next January with the fiscal year 1967 budget estimates, we will have completed this work and we will have a much more precise estimate of all of these additional costs and our financial requirements for the balance of fiscal year 1966. Accordingly, we propose that these additional military personnel and operation and maintenance costs be financed during the interim under section 512 of the fiscal year 1966 Defense appropriations bill, as approved by the House (H.R. 9221).

Subsection 512(a) of the Bill provides that:

During the current fiscal year, the President may exempt appropriations, funds, and contract authorizations, available for military functions under the Department of Defense, from the provisions of subsection (c) of section 3679 of the Revised Statutes, as amended, whenever he deems such action to be necessary in the interests of national defense.

Subsection 512(c) provides that:

Upon determination by the President that it is necessary to increase the number of military personnel on active duty beyond the number for which funds are provided in this Act, the Secretary of Defense is authorized to provide for the cost of such increased military personnel, as an excepted expense in accordance with the provisions of Revised Statutes 3732 (41 U.S.C. 11).

PROCUREMENT AND CONSTRUCTION

As in the case of personnel and operation and maintenance costs, we have not as yet had sufficient time to develop detailed requirements and production and construction plans for the additional

materiel and facilities needed for the support of the expanding operations in southeast Asia. And again, we will be in a much better position next January to provide these details and to state our additional requirements for the balance of fiscal year 1966. The \$1.7 billion amendment to the bill now before the committee which we are proposing at this time will provide the additional financing needed through January to gear up the production machine—to accelerate the delivery of essential items already in production and to initiate the production of new items required for the support of our forces in southeast Asia, as well as the construction of the most urgently needed facilities. We suggest that this amendment take the form of a new appropriation account—"Emergency fund, southeast Asia"—and that the language be similar, except for the amount, to the \$700 million fiscal year 1965 supplemental for southeast Asia.

As you know, we have planned in our fiscal year 1966 and prior year budgets a substantial buildup of war consumable stocks, particularly modern ordnance and ammunition. If we are to fulfill these plans, we must replace what we are drawing from these stocks for consumption in southeast Asia. Furthermore we must provide replacements for the aircraft being lost there in combat. And finally, we must buy some additional helicopters for the new Army and Marine Corps aviation units which we now plan to activate.

The higher activity rates planned for our forces in southeast Asia will increase considerably the consumption of spares and repair parts for many types of equipment. Stocks of these items must be restored through increased production. We will also need to replace in our inventories the additional quantities of equipment for the new bases being established or expanded in southeast Asia. Funds for these purposes are included in the \$1.7 billion supplemental.

Finally, the increased deployments of U.S. forces to southeast Asia will require an extensive program of construction in South Vietnam and along the lines of communication back to the United States. Included in this program are airfields, ports and troop support and logistics facilities.

SUMMARY

Last Wednesday in his statement on Vietnam, President Johnson said:

"I have asked the Commanding General, General Westmoreland, what he needs to meet this mounting aggression. He has told me. We will meet his needs."

The program I have outlined here today and the \$1.7 billion amendment to the fiscal year 1966 Defense appropriation bill now before the committee will, in the collective judgment of my principal military and civilian advisers and myself provide the men, materiel, and facilities required to fulfill this pledge, while at the same time maintaining the forces required to meet commitments elsewhere in the world. I earnestly solicit the full support of this committee and the Congress for this program and budget request.

Summary by program of proposed personnel increases

1. Increase in Army forces:		
(a) 1 division force		
(b) 3 brigade forces		
(c) Aviation companies		
(d) Combat service support		
(e) STRAF support forces		
(f) Expand training		
(g) Transients and other support		
Total, Army	-----	235, 000
2. Augmentation of the three Marine Corps division/aircraft wings:		
(a) Bring units to be deployed in Vietnam up to full strength		
(b) Activate new units to augment the forces to be deployed		
(c) Expand training		
(d) Provide increased pipeline		
Total, Marine Corps	-----	30, 000
3. Strengthening the naval forces:		
(a) Retain ships		
(b) Activate ships		
(c) Increase manning for deployed ships and bases in southeast Asia		
(d) Other support (pipeline, Marine Corps, etc.)		
Total, Navy	-----	35, 000
4. Augmentation of the Air Force strike and airlift capabilities:		
(a) B-52 aircraft deployed to Guam		
(b) Tactical fighter and troop carrier squadrons deployed to southeast Asia		
(c) Retain 1 reconnaissance squadron scheduled to be phased out in fiscal year 1966		
(d) Raise airlift aircraft utilization rates:		
MATS		
PAC-TAC		
(e) Expand training		
(f) Other support (logistical base)		
Total, Air Force	-----	40, 000
5. Increased readiness for the Reserve components:		
Army:		
(a) 3 division forces	-----	(1)
(b) 6 brigade forces	-----	(1)
Marine Corps:		
(c) 4th Division/aircraft wing	-----	2, 500
Air Force:		
(d) 9 F-100 squadrons	-----	1, 667
(e) 4 RF-84 squadrons	-----	697
(f) 11 C-124 squadrons	-----	2, 205
Total, Air Force	-----	4, 569
6. Recapitulation of personnel increases:		
(a) Active duty military personnel:		
Army	-----	235, 000
Navy	-----	35, 000
Marine Corps	-----	30, 000
Air Force	-----	40, 000
Total	-----	340, 000
(b) Reserve component paid drill spaces:		
Army	-----	(1)
Marine Corps	-----	2, 500
Air Force	-----	4, 569
Total	-----	(1)
(c) Direct hire civilian personnel, total	-----	35, 762

¹ Army numbers still to be determined.

**STATEMENT OF SECRETARY OF DEFENSE ROBERT S.
McNAMARA**

(Before a joint session of the Senate Armed Services Committee and the Senate Subcommittee on Department of Defense Appropriations, fiscal year 1966 supplemental for southeast Asia, January 20, 1966)

Mr. Chairman and members of the committee, when I appeared before this committee last August with the amendment to the fiscal year 1966 Defense budget, I described to you the actions we were taking to carry out the President's decision to deploy a force of 125,000 U.S. military personnel to South Vietnam and to be prepared to deploy still more forces if that should become necessary. I noted at the time that if we were to maintain our capabilities to deal with crises elsewhere in the world, these deployments would require some increases in forces, personnel, operating rates, production rates, and construction of facilities above the levels provided in our original fiscal year 1966 budget.

Because we had not had time to work out detailed personnel plans and to calculate on a phased basis the increases in activity rates, the movements of troops and materiel, and the other operation and maintenance costs associated with the buildup in southeast Asia, we proposed to finance the additional military personnel and O. & M. costs under section 612 of the fiscal year 1966 Defense Appropriation Act. Similarly, because we had not had time to develop detailed estimates of production and construction plans for the additional materiel and facilities required, we proposed, and the Congress appropriated, an additional \$1.7 billion in a separate account, "Emergency fund, southeast Asia". This appropriation was intended to provide for the additional financing needed through early 1966 to gear up the production machine, accelerate the delivery of essential items already in production, initiate production of new items required for the support of our forces in southeast Asia, and construct the most urgently needed facilities.

I said at the time that when we appeared here this January we would have a much more precise estimate of the additional requirements and our financial needs for the balance of fiscal year 1966. These estimates are now available, and total \$12,345,719,000 in new obligational authority.

**INCLUSION OF CERTAIN MILITARY ASSISTANCE SUPPORT IN THE
DEFENSE BUDGET**

Included in our supplemental request for fiscal year 1966 is about \$200 million for the support of South Vietnam's Armed Forces and other free world military assistance forces engaged in that country. These requirements have heretofore been financed in the military assistance program. However, now that large U.S. and other free world military assistance forces (e.g., Korean) have joined in the

defense of South Vietnam, the maintenance of separate financial and logistic systems for U.S. and military assistance forces is proving to be entirely too cumbersome, time-consuming, and inefficient. The same problem was encountered at the outset of the Korean war. It was solved, then, by programing, budgeting, and funding for all requirements under the "military functions" appropriations and providing a consolidated financial and supply system for the support of United States, Korean, and other friendly forces engaged in that effort. This arrangement gave the field commanders maximum flexibility in the allocation of available resources and improved the support of the forces employed. We are proposing essentially the same solution for the problems now being encountered in South Vietnam.

Under the proposed arrangement, all unexpended balances of fiscal year 1966 and prior year military assistance funds for South Vietnam would be transferred to and merged with the accounts of the military departments; and all additional funds required for the support of the forces of South Vietnam and other free world military assistance forces in that country would be authorized for and appropriated to the accounts of the military departments. The remainder of the military assistance program would be legislated separately.

IMPLEMENTATION OF THE AUGUST 1965 FORCE AUGMENTATIONS

Since my appearance here last August, our requirements in support of the military effort in Vietnam have continued to grow. We have already deployed a total of about 190,000 U.S. military personnel to South Vietnam, excluding the elements of the 7th Fleet now operating off the coast of Vietnam. And we must be prepared to deploy even more forces if the Communists choose to expand their operations in South Vietnam.

The force augmentations approved in August included:

For the Army: An increase of one division force, three brigade forces, and a large number of aviation companies.

For the Marine Corps: An increase of two helicopter training squadrons, and additional communications, engineer, and military police battalions.

For the Navy: An increase of 25 active ships in the fleet plus four for MSTs, for a total of 29.

For the Air Force: An increase in airlift aircraft utilization rates, from 5 to 8 hours per day for Military Airlift Command (formerly MATS) aircraft, and from 1.5 to 5 hours per day for C-130E's in other commands.

For all the Active Forces: Additional personnel to round out the manning of units to be deployed in Vietnam and for increased training and logistic support.

For the Reserve components: Additional drill pay spaces to raise the manning and readiness levels of three divisions and six brigades and necessary supporting forces in the Army Reserve components, 24 squadrons in the Air Force Reserve components, and the Marine Corps Reserve division/aircraft wing.

An additional 340,000 military and 36,000 direct hire civilian personnel were approved to support these force increases.

FURTHER FORCE AUGMENTATIONS AND RELATED PERSONNEL INCREASES

If we are to be prepared to deploy additional forces to southeast Asia, some further augmentations of our forces and personnel strengths are required. The increases in forces and personnel now proposed are summarized in table 1. The first column shows the personnel increases approved in August 1965 and the second column the increases as revised in January 1966. A number of these changes require some explanation.

In the Army, the major change since last August is in the number of additional military personnel required for the support forces. Inasmuch as it appears desirable to be in position to deploy additional forces without calling up Reserves, these support units must be provided in the Active Force structure. In addition to that change, we have also added another large increment of Army aviation companies to the number approved in August.

The major increase in the Marine Corps over last August is an additional division force, together with a number of tactical helicopter squadrons, observation squadrons and an air support control unit.

In the Navy, we have added to the forces approved in August: 11 LST's and one refrigerator stores ship for logistic support, more SWIFT boats and a mother ship to augment our coastal patrol activities, a number of river control boats and yard craft, and one destroyer. We have also augmented the Navy construction battalions in the Pacific area and are adding four new construction battalions to the Navy structure.

The increases in the Air Force are related to the retention of B-57 and F-102 aircraft previously scheduled to be phased out, a major expansion in the rotation and training base and the logistic support required for the forces in Vietnam.

As shown on the bottom of table 1, a total of about 510,000 military personnel will be required to man the additional forces and support the increased training, rotation, and logistic base. Other adjustments in forces and activities will add another 17,000, but our decision to substitute some 58,000 civilian for 74,000 military personnel spaces will reduce the net increase over the original end fiscal year 1966 military personnel strength to about 453,000, some 113,000 more than the increase approved last August.

When I appeared before this committee last August, we had not as yet determined the number of additional drill pay spaces needed in the Army Reserve components to raise the manning of three division and six brigade forces to 100 percent, or how these spaces should be made available. The number of additional spaces required for this purpose is now estimated at 30,000—18,500 in the Army National Guard and 11,500 in the Army Reserve. The additional spaces needed in the Army Reserve have been provided by a redistribution from units for which there is no requirement in our plans. The 18,500 spaces needed for that purpose in the Army National Guard, plus 20,000 spaces needed to man other Guard units at their authorized strengths, have been added to the 380,000 spaces provided for in the fiscal year 1966 Defense Appropriation Act.

With regard to civilian personnel, the major part of the increase over the number approved last August is related to the substitution of civilian for military personnel, as shown in table 1.

Table 2 provides a recapitulation of the proposed personnel increases, including those related to southeast Asia. The second column shows the additional personnel required for the support of the southeast Asia effort over and above the numbers provided in the original fiscal year 1966 budget as shown in column 1. The third column shows the adjustments resulting from the substitution of civilians for military personnel. The fourth column shows other adjustments (pluses and minuses) related to productivity savings, nonsoutheast Asia related force changes, etc. The fifth column shows the net additions to the original end fiscal year 1966 strengths. The next column shows the number scheduled to be on hand at end fiscal year 1966 and the last column the balance to be added thereafter.

ADDITIONAL FISCAL YEAR 1966 REQUIREMENTS FOR PROCUREMENT, R.D.T. & E. AND CONSTRUCTION

Table 3 shows the additional funds required for the balance of the current fiscal year for procurement, for research, development, test, and evaluation, and for military construction in support of our combat operations in southeast Asia. Of the \$1.7 billion added to the fiscal year 1966 budget last August, about \$1,534 million was applied to procurement, particularly for long leadtime components, new production equipment, tooling, and all the actions necessary to accelerate production rates—but not actually to finance these higher production rates beyond about February 1966. That is the purpose of the additional \$7 billion which we are now requesting for procurement in this fiscal year 1966 supplemental for southeast Asia.

The balance of the \$1.7 billion added to the fiscal year 1966 Defense budget last August, about \$166 million, was used to finance (through February 1966) the most urgent construction projects needed for the support of our military operations in southeast Asia. The additional \$1,238 million included in the supplemental will complete the financing of the fiscal year 1966 increment of that construction program.

In preparing the estimates of our financial requirements for the balance of fiscal year 1966, we have assumed, for budgeting purposes, that combat operations will continue through the end of June 1967; thus the entire requirement for the longer leadtime items through that date is included in this supplemental.

AMMUNITION

As shown on table 3, about \$2.1 billion is included in the fiscal year 1966 supplemental for ammunition which, together with the approximately \$1.1 billion included in the original fiscal year 1966 budget and \$800 million from the August amendment, gives us a total of about \$4.1 billion for fiscal year 1966. This is, admittedly, a very high figure; but our operational plans call for a massive application of firepower to enhance the effectiveness of our forces and reduce casualties.

We estimate that our ground forces (including associated helicopter units) are now consuming ammunition at the rate of about \$100

million per month, and we are budgeting for a consumption rate considerably higher. It is important to note that whereas in 1964 we had no artillery in Vietnam, we now have a substantial number of artillery battalions there. In 1964, the U.S. Army and Marine Corps flew an average of 19,000 helicopter sorties per month; by the middle of last year they were flying about 60,000 sorties per month and at the end of the year, about 125,000. This intensive use of helicopters greatly increases our mobility, making it possible to operate with a much smaller central reserve and to conduct offensive operations without prolonged depletion of our forces in areas already under our control. Many of these helicopters are armed and provide a highly mobile source of firepower.

With regard to air munitions, we are now consuming at a rate of about \$110 million per month; and we are preparing to support a much higher rate. For example, in March 1965 we flew 800 attack (ordnance consuming) sorties in order to stem the flow of war materiel and personnel into South Vietnam. By June of last year, the number of these sorties had increased to 2,800 and by December to over 5,000. The number of attack sorties flown by fixed-wing tactical aircraft against targets in South Vietnam has increased from a monthly average of 1,200 in 1964 to 7,200 in June 1965 and almost 13,000 in December 1965. In addition, we have been flying approximately 300 B-52 sorties, consuming about 6,000 tons of bombs per month since July 1965. Overall, we consumed about 25,000 tons of aircraft-delivered munitions in July 1965 and more than 40,000 tons in December of that year, or at an annual rate of 480,000 tons; and this supplemental will support a considerably higher rate.

AIRCRAFT

Although the aircraft loss rate continues low, the rapidly increasing number of sorties is resulting in larger total losses. In 1964, we lost 38 fixed-wing aircraft and 24 helicopters to hostile action. In 1965, with both the very large increase in activity and the attacks against North Vietnam, we lost 275 fixed-wing aircraft and 76 helicopters. We anticipate that 1966 losses will be somewhat higher. A total of about \$1.8 billion for the replacement of aircraft losses is included in the fiscal year 1966 supplemental. Another \$168 million is included for the Army to equip new aviation units.

The considerably higher rates of utilization of many types of aircraft in all the services will also increase the consumption of spares. For example, Air Force tactical aircraft in Vietnam are now flying 60 percent more hours per month than they normally do in peacetime. And you may recall that I mentioned last August, we were increasing the utilization rate of Military Airlift Command aircraft also by about 60 percent. Accordingly, we have included in the fiscal year 1966 supplemental about \$1.2 billion for aircraft spares and other aircraft equipment for all the services.

OTHER MATERIEL

The additional funds requested for vehicles, electronics, and communications, and other procurements are mostly to equip new units, notably the additional Army and Marine Corps divisions, and for

logistic and training support as well as to equip the new facilities being built in southeast Asia.

INCREASES IN PRODUCTION RATES

To support these higher rates of consumption and combat attrition, rebuild inventories and provide for the additional forces, we have greatly increased production rates and started new production lines. Planned production rates of the principal types of helicopters used in Vietnam have been just about tripled and certain fixed-wing types just about doubled. Production rates of the principal munition items have been increased many fold and major increases have been made in the production of tropical uniforms and jungle boots.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

The \$152 million included in the fiscal year 1966 supplemental for R.D.T. & E. is to accelerate certain development projects of particular interest to our operations in southeast Asia. You may recall that one of the items included in our first set of amendments to the fiscal year 1962 budget was the sum of \$122 million for research and development of nonnuclear weapons and equipment specifically designed for limited wars and counterinsurgency operations. Since that time, we have vigorously pursued our efforts in that area and many of the new weapons, equipment and techniques now being employed in Vietnam came out of this work, e.g., the armed helicopter, jungle communications equipment, battlefield radars, defoliation agents, emergency airfield equipment, lightweight body armor, minigun armed aircraft, ammunition for M-79 grenade launchers, jungle boots, etc.

Many other items of this type are now well along in development. In order to make them available for use in Vietnam at the earliest possible time, we have undertaken a new effort called Project Provost (priority research and development objectives for Vietnam operations support), designed to identify those current R. & D. projects which could make a significant contribution to our military operations in Vietnam, and which, with additional funds, could be brought to fruition relatively quickly. So far the military departments have identified over 150 items of this type, and we have already utilized about \$58 million from the fiscal year 1966 R. & D. emergency fund for their support. We are now requesting an additional \$152 million for fiscal year 1966 to continue and expand this effort and to meet other urgent requirements. Among the items to be supported with these additional funds are the development of a therapeutic drug for fulciparum malaria and a wide variety of surveillance devices, weapons, munitions, and personal equipment.

MILITARY CONSTRUCTION

As shown on table 3, the bulk of the \$1.2 billion requested for military construction is for facilities in southeast Asia. The balance is for a variety of supporting facilities along the lines of communication back to the United States, and, to a small extent, for training and troop facilities within the United States. The \$1,238 million requested in this supplemental, together with the \$166 million provided by the

August amendment, will make a total of \$1,404 million available for construction in support of southeast Asia in fiscal year 1966, \$355 million more than the entire appropriation for military construction in fiscal year 1965.

The explanation for this large request lies in the nature of the military operation we have undertaken in southeast Asia. South Vietnam itself is primarily an agricultural country; the only major port is Saigon. The deployment of large U.S. military forces, and other friendly forces such as the Korean division, in a country of this sort requires the construction of new ports, warehouse facilities, access roads, improvements to highways leading to the interior of the country and along the coasts, troop facilities, hospitals, completely new airfields and major improvements to existing airfields, communications facilities, etc. We will be prepared to house and support additional units if their deployment should be required in the future. Since construction is a long leadtime activity, the great bulk of this requirement has to be financed in the fiscal year 1966 supplemental. In order to provide some flexibility in the utilization of these funds, we are requesting that \$200 million of the \$1,238 million total program be appropriated to "Military construction, Defense agencies," for later transfer to the military departments as required.

Although I cannot assure you that the funds requested in this supplemental will complete our construction program in southeast Asia, since we do not know how the conflict there may evolve, I can tell you that the amount included in the fiscal year 1967 budget for military construction is very much smaller.

FINANCIAL REQUIREMENTS

Table 4 summarizes our financial requirements for the current fiscal year. The first column shows the amounts thus far enacted, less the \$1.7 billion amendment which is shown in the second column. The third column shows the net additional amounts required in fiscal year 1966 to defray the costs of the pay raises enacted last year. The fourth column is the supplemental for southeast Asia which I have discussed, and the fifth column shows the total, \$63,308,175,000 in new obligational authority, which would be available for the current fiscal year if the military and civilian pay supplemental and the southeast Asia supplemental are enacted as requested.

I should point out that we have included in the southeast Asia supplemental for the military personnel accounts of the Active Forces a total of \$440 million which, last January, we had planned on obtaining by transfer from the working capital funds of the Department of Defense in lieu of new appropriations. You may recall that the total amount planned for transfer last January was \$470 million—\$30 million from the cash balances of the Army Industrial Fund and \$440 million from the cash balances of the Army, Navy, Marine Corps, Air Force, and Defense Stock Funds. Because of the expansion of the forces and the higher rates of activity, the stock funds have had to increase their inventory levels, thus decreasing their balances to a point where no excess cash is available for transfer to the military personnel accounts. Indeed, we are proposing a new general provision which would relieve the stock funds of the present requirement that their cash balances must be at least equal to the amount of

accounts payable at all times. They would, of course, continue to retain sufficient cash to meet their day to day disbursement needs. In addition, this general provision would also permit transfer between such funds in such amounts as may be determined by the Secretary of Defense with the approval of the Bureau of the Budget.

The \$30 million from the Army Industrial Fund is still available and will be transferred, as planned, to the "Military personnel, Army," account in fiscal year 1966. Accordingly, we are requesting the appropriation of only \$440 million to replace the balances which were to have been transferred from the stock fund.

As shown on table 4, \$1,620 million has been included in this supplemental for military personnel, of which \$64 million is for the Reserve components to raise the manning of the selected forces. About \$2,316 million will be required for operations and maintenance, including the additional funds needed by the Reserve components for the support of the additional personnel and the higher readiness levels. I have already discussed the amounts required for procurement, R.D.T. & E., and military construction.

ADDITIONAL AUTHORIZATIONS

The additional amounts requested to be authorized for aircraft, missiles, naval vessels and tracked combat vehicles, and R.D.T. & E., are shown in tables 5 through 7. The additional military construction authorizations are identical to the amounts requested for appropriation, as shown on table 3.

* * *

The President, in his state of the Union address to the Congress on January 13, discussed the reasons for our greater military involvement in southeast Asia and the resulting increases in Defense expenditures. I have attempted in this statement to outline the purposes for which the additional funds requested in this supplemental are required. I can assure you that my associates in the Defense Department and I have reviewed this supplemental with great care, and we now stand ready to help you in every way we can to facilitate the passage of the necessary legislation.

TABLE 1.—Summary of force and personnel increases related to southeast Asia

	Approved August 1965	Revised January 1966
1. Increase in Army Forces:		
(a) Division and initial support forces.....		
(b) 3 brigades and initial support forces.....		
(c) Aviation companies.....		
(d) Sustaining support for 1 division, 3 brigades, and other forces.....		
(e) STRAF support forces.....		
(f) Expand training base and pipeline.....		
Total, Army.....	235,000	306,657
2. Increase in Marine Forces:		
(a) 1 division.....		
(b) Activate forces to be deployed to Vietnam.....		
(c) Bring units to be deployed to full strength.....		
(d) Expand training and support base.....		
(e) Provide increased pipeline.....		
Total, Marine Corps.....	30,000	85,169
3. Increase in Naval Forces:		
(a) Retain ships.....		
(b) Activate or procure ships.....		
(c) Increase manning for deployed ships and bases in southeast Asia.....		
(d) Augment coastal and river patrol.....		
(e) Augment construction forces.....		
(f) Support of Marine forces.....		
(g) Flight training.....		
Total, Navy.....	35,000	55,450
4. Increase in Air Forces:		
(a) B-52 aircraft deployed to Guam.....		
(b) Tactical fighter and troop carrier squadrons deployed to SEA and their CONUS rotation base.....		
(c) Raise airlift aircraft utilization rates.....		
(d) Expand training.....		
(e) Other support (including logistical base).....		
Total, Air Force.....	40,000	63,245
Total Active Force, military.....	340,000	510,521
Adjustment for substitution of civilians.....		-74,300
Other adjustments.....		+16,622
Net increase.....	340,000	452,843
5. Increased readiness for Reserve components:		
Army:		
(a) To raise 3 division and 6 brigade forces to 100 percent manning.....	(¹)	18,500
(b) To man other ANG units at their authorized strengths.....		20,000
Total, Army.....		38,500
Marine Corps:		
(c) Reserve division/wing team.....	2,500	2,500
Air Force:		
(d) 9 F-100 squadrons.....	1,667	1,667
(e) 4 RF-34 squadrons.....	697	697
(f) 1 Tactical control group.....		436
(g) 11 C-124 squadrons.....	2,205	2,205
Total, Air Force.....	4,569	5,005
6. Increase in direct hire civilian personnel:		
(a) Army.....	11,600	31,133
(b) Navy (including Marine Corps).....	15,500	21,400
(c) Air Force.....	7,300	18,355
(d) Defense agencies.....	1,362	4,893
Total personnel.....	35,762	75,781
Adjustment for substitution of civilians.....		+58,000
Other adjustments.....		-4,554
Net Increase.....	35,762	129,227

¹ Was to be determined.

² The remaining 11,500 personnel required to raise the manning of the selected Reserve Force to 100 percent is being provided by redistribution from units for which there is no requirement in the contingency plans.

³ Represents increase over the end fiscal year 1966 Army National Guard drill pay strength of 330,000 provided for in the fiscal year 1966 Appropriation Act.

TABLE 2.—Recapitulation of military and civilian personnel authorizations

	Budgeted strength as of June 30, 1966 per original budget.	Increases proposed as of August 1965 and January 1966	Adjustment for substitution of civilians	Other adjustments	Net increase proposed	Strength increase to be realized	
						By June 30, 1966	After June 30, 1966
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Active duty military personnel:							
Army.....	953,094	306,657	-36,500	+10,432	280,599	205,949	74,650
Navy.....	684,848	55,450	-15,000	+2,575	43,025	38,875	4,150
Marine Corps.....	193,190	85,169	-2,800	-2,625	84,994	56,889	28,105
Air Force.....	809,134	63,245	-20,000	-980	44,225	45,364	¹ -1,139
Total.....	2,640,266	510,521	-74,300	+16,622	452,843	347,077	105,766
Direct hire civilian personnel:							
Army.....	317,152	31,133	+26,585	-16,947	40,771	42,480	¹ -1,709
Navy (including USMC).....	320,125	21,400	+14,415	+6,953	42,768	37,476	5,292
Air Force.....	286,099	18,355	+17,000	-12,737	22,618	15,279	7,339
Defense agencies.....	40,778	4,893	-----	+18,177	23,070	27,727	¹ -4,657
Total.....	964,154	75,781	² +58,000	-4,554	129,227	122,962	6,265

¹ Denotes a small decrease in strength after end of fiscal year 1966.² Excludes 2,500 additional indirect hire civilians, bringing the total to 60,500.

TABLE 3.—Fiscal year 1966 supplemental for procurement, R.D.T. & E. and military construction related to southeast Asia (new obligational authority)

[In millions of dollars]

	Army	Navy	Marine Corps	Air Force	Defense agencies	Total
Procurement:						
Ammunition consumption.....	671	366	338	768	-----	2,133
Aircraft:						
Attrition.....	400	562	(¹)	837	-----	1,799
Equipment of new units.....	168	-----	(¹)	-----	-----	168
Spares.....	221	149	(¹)	555	-----	925
Other aircraft equipment.....	37	27	(¹)	194	-----	258
Total aircraft.....	826	738	(¹)	1,586	-----	3,150
Vehicles.....	329	39	71	66	-----	505
Electronics and communications.....	241	45	42	76	-----	404
Other.....	398	184	66	179	-----	827
Total procurement.....	2,465	1,372	517	2,665	-----	7,019
R.D.T. & E.....	28	53	(¹)	71	-----	152
Military construction:						
South Vietnam.....	408	207	(¹)	110	-----	725
Other locations.....	172	83	(¹)	198	-----	453
Planning.....	30	15	(¹)	16	-----	61
Total program.....	610	305	(¹)	324	-----	1,238
To be appropriated to military department.....	510	255	(¹)	274	-----	1,039
To be appropriated to defense agencies.....	-----	-----	-----	-----	200	200
Total appropriation.....	510	255	(¹)	274	200	1,238

¹ Included in the Navy.

NOTE.—Detail may not add to totals due to rounding.

TABLE 4.—Financial summary of fiscal year 1966 budget including the proposed supplemental for southeast Asia

[In thousands of dollars]

	NOA enacted excluding amendment	\$1.700 million amend-ment	Military and civilian pay supplemental	SEA supplement- al	Total NOA
Military personnel:					
Army.....	4,092,291		222,100	833,600	5,147,991
Navy.....	3,055,000		182,600	318,500	3,556,100
Marine Corps.....	749,900		42,400	184,600	976,900
Air Force.....	4,393,800		227,600	219,300	4,840,700
National Guard personnel, Army.....	271,800		4,500	45,900	322,200
Reserve personnel, Army.....	238,600			7,500	246,100
National Guard personnel, Air Force.....	71,300		3,500	5,700	80,500
Reserve personnel, Navy.....	105,100		4,600		109,700
Reserve personnel, Marine Corps.....	33,000		1,600	2,200	36,800
Reserve personnel, Air Force.....	60,500		1,200	2,700	64,400
Retired pay, Defense.....	1,529,000		71,000		1,600,000
Total military personnel.....	14,600,291		761,100	1,620,000	16,981,391
Operation and maintenance:					
Army.....	3,434,067		33,400	1,077,200	4,544,667
Navy.....	3,292,137		23,000	506,000	3,821,137
Marine Corps.....	192,101		1,054	102,600	295,755
Air Force.....	4,403,737		27,600	544,900	4,976,237
Defense agencies.....	683,680		14,356	41,769	739,805
Army National Guard.....	208,796		2,000	35,700	246,496
Air National Guard.....	238,000		1,000	8,100	247,100
National Board for Promotion of Rifle Practice, Army.....	459				459
Claims, Defense.....	24,000				24,000
Contingencies, Defense.....	15,000				15,000
Court of Military Appeals, Defense.....	579		11		590
Total operation and maintenance.....	12,492,556		102,421	2,316,269	14,911,246
Procurement:					
Equipment and missiles, Army.....	1,204,800	504,500		2,465,000	4,174,300
Aircraft and missiles, Navy.....	2,220,387	190,200		764,500	3,175,087
Shipbuilding and conversion, Navy.....	1,590,500				1,590,500
Other procurement, Navy.....	1,135,000	167,090		607,500	1,909,590
Procurement, Marine Corps.....	43,800	149,100		516,600	709,500
Aircraft procurement, Air Force.....	3,516,700	158,800		1,585,700	5,261,200
Missile procurement, Air Force.....	771,900	4,000		63,700	839,600
Other procurement, Air Force.....	829,100	360,600		1,016,400	2,206,100
Defense agencies.....	15,200				15,200
Total procurement.....	11,327,387	1,534,290		7,019,400	19,881,077
Research, development, testing, and evaluation:					
Army.....	1,433,988			27,995	1,461,983
Navy.....	1,513,130			52,570	1,565,700
Air Force.....	3,181,956			71,085	3,253,041
Defense agencies.....	491,300				491,300
Emergency fund, Defense.....	19,426				19,426
Total, R.D.T. & E.....	6,639,800			151,650	6,791,450
Military construction:					
Army.....	346,843	64,600		509,700	921,143
Navy.....	329,405	43,210		254,600	627,215
Air Force.....	361,773	57,900		274,100	693,773
Defense agencies.....	19,768			200,000	219,768
Army Reserve.....					
Naval Reserve.....	9,500				9,500
Air Force Reserve.....	4,000				4,000
Army National Guard.....	10,000				10,000
Air National Guard.....	10,000				10,000
Loran stations, Defense.....	5,000				5,000
Total, military construction.....	1,096,289	165,710		1,238,400	2,500,399
Family housing, Defense.....	665,846				665,846
Civil defense:					
Operation and management, civil defense.....	64,066				64,066
Research, shelter survey and marking, civil defense.....	42,700				42,700
Total, civil defense.....	106,766				106,766
Total, military functions.....	46,928,935	1,700,000	863,521	12,345,719	61,838,175

TABLE 4.—Financial summary of fiscal year 1966 budget including the proposed supplemental for southeast Asia—Continued

[In thousands of dollars]

	NOA enacted excluding amendment	\$1,700 million amendment	Military and civilian pay supplemental	SEA supplemental	Total NOA
Military assistance: Executive.....	1,470,000	-----	-----	-----	1,470,000
Total, Department of Defense.....	48,398,935	1,700,000	863,521	12,345,719	63,308,175
Recapitulation:					
Army.....	11,241,644	569,100	262,000	5,002,595	17,075,339
Navy.....	14,268,960	549,600	255,254	3,309,670	18,383,484
Air Force.....	17,842,766	581,300	260,900	3,791,685	22,476,651
Defense agencies.....	3,468,799	-----	985,367	241,769	3,795,935
Civil defense.....	106,766	-----	-----	-----	106,766
Military assistance.....	1,470,000	-----	-----	-----	1,470,000
Total.....	48,398,935	1,700,000	863,521	12,345,719	63,308,175

TABLE 5.—Amounts requested for aircraft, missiles, ships, and tracked combat vehicle procurement authorization in fiscal year 1966 supplemental request

[In thousands]

	Authorized ¹ fiscal year 1966	Appropriated ¹ fiscal year 1966	Supplemental (NOA) fiscal year 1966
Aircraft:			
Army.....	\$485,400	\$485,400	\$825,600
Navy and Marine Corps.....	2,100,400	2,104,500	738,300
Air Force.....	3,709,000	3,675,800	1,385,700
Missiles:			
Army.....	253,700	277,000	64,000
Navy.....	369,600	358,200	26,200
Marine Corps.....	15,200	15,200	27,500
Air Force.....	800,100	800,100	63,700
Naval vessels: Navy.....	1,721,000	1,590,500	-----
Tracked combat vehicles:			
Army.....	-----	-----	75,800
Marine Corps.....	-----	-----	10,900
Total.....	9,454,400	9,306,700	3,417,700

¹ Included amounts totaling \$496,100,000 provided through emergency fund for southeast Asia, Public Law 89-213.

TABLE 6.—Source of funds for aircraft, missiles, ships, and tracked combat vehicles, fiscal year 1966 supplemental procurement program

[In thousands]

	Total fiscal year 1966 program	Funding available ¹ for financing program in part	NOA requested for authorization
Aircraft:			
Procurement of equipment and missiles, Army	\$1,333,200	\$507,600	\$925,600
Procurement of aircraft and missiles, Navy (and Marine Corps)	3,224,000	2,485,700	738,300
Aircraft procurement, Air Force	5,586,200	4,010,500	1,585,700
Subtotal, aircraft	10,153,400	7,003,800	3,149,600
Missiles:			
Procurement of equipment and missiles, Army	368,600	304,600	64,000
Procurement of aircraft and missiles, Navy	381,600	355,400	26,200
Procurement, Marine Corps	42,700	15,200	27,500
Missile procurement, Air Force	1,242,800	1,179,100	63,700
Subtotal, missiles	2,035,700	1,854,300	181,400
Naval vessels: Shipbuilding and conversion, Navy	1,930,500	1,930,500	
Track combat vehicles:			
Procurement of equipment and missiles, Army	375,700	299,900	75,800
Procurement, Marine Corps	13,400	2,500	10,900
Subtotal, tracked combat vehicles	389,100	302,400	86,700
Grand total	14,508,700	11,091,000	3,417,700

¹ Includes total amount of \$496,100,000 provided through emergency fund for southeast Asia, Public Law 89-213.

TABLE 7.—Amounts requested for R.D.T. & E. authorization in fiscal year 1966 supplemental request

[In thousands]

	Authorized, fiscal year 1966	Appropriated, fiscal year 1966	Supplemental (NOA), fiscal year 1966
Research, development, test, and evaluation:			
Army	\$1,406,400	\$1,406,400	\$27,995
Navy (including the Marine Corps)	1,439,200	1,439,200	52,570
Air Force	3,103,900	3,103,900	71,085
Defense agencies	495,000	495,000	0
Emergency fund	(¹)	125,000	0
Total	6,444,500	6,569,500	151,650

¹ Not available.

DEFENSE BUDGET HIGHLIGHTS*

APPROACH TO THE FISCAL YEARS 1968-72 PROGRAM AND THE FISCAL YEAR 1967-68 BUDGETS

(Editor's Note: This issue of the Defense Industry Bulletin is devoted almost entirely to Secretary of Defense Robert S. McNamara's statement on January 23, 1967, before a joint session of the Senate Armed Services Committee and the Senate Subcommittee on Department of Defense Appropriations on the fiscal years 1968-72 Defense program and the 1968 Defense budget.

While space limitations permit only an abbreviated treatment of the statement, an attempt has been made to excerpt those portions which are of special interest to Defense industry. Using the method established in previous years, paragraph markings have been deleted from the original text for the sake of clarity.

The statement of the Secretary of Defense on the fiscal year 1967 supplemental for southeast Asia will be carried in next month's issue of the Bulletin.)

Last year when I appeared before this committee in support of the fiscal years 1967-71 program and the fiscal year 1967 budget I said:

With regard to the preparation of the fiscal years 1967-71 program and the fiscal year 1966 supplemental and the fiscal year 1967 budget, we have had to make a somewhat arbitrary assumption regarding the duration of the conflict in southeast Asia. Since we have no way of knowing how long it will actually last or how it will evolve, we have budgeted for combat operations through the end of June 1967. This means that if it later appears that the conflict will continue beyond that date, or if it should expand beyond the level assumed in our present plans, we will come back to the Congress with an additional fiscal year 1967 request.

Throughout the spring and summer of last year in my appearances before various congressional committees, I reiterated the fact that the fiscal year 1967 budget was based on the arbitrary assumption that the conflict would end by June 1967, and that additional funds would be required if the conflict continued.

What we were trying to do was to avoid the overfunding which occurred during the Korean war when the Defense Department requested far more funds than were actually needed. For example, the Defense Department requested a total of about \$164 billion for the 3 fiscal years 1951-53; the Congress appropriated a total of \$156 billion; the amount actually expended was \$102 billion; and the unexpended balances rose from \$10.7 billion at the end of fiscal year 1950 to \$62 billion by the end of fiscal year 1953. It took about 5 years to work the unexpended balance down to about \$32 billion; and we were able to support a Defense program of about \$50 billion

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a year during fiscal years 1962-64 with about \$30 billion of unexpended balances.

Although we still have no way of knowing when the conflict will end, it is perfectly clear that we must take whatever measures are necessary to ensure our ability to support our forces in the event the conflict does continue beyond June 30, 1967. Indeed, when it became apparent last summer that this was likely to be the case, we continued the buildup of our military personnel strength beyond the level anticipated in the fiscal year 1967 budget and took action to ensure that deliveries of long lead time items would continue beyond June 30, 1967, without interruption. The Congress was informed of these actions through the reprogramming process and related hearings.

But, while it was clear even last summer that additional funds would be required for fiscal year 1967 if the conflict in southeast Asia were to continue, the timing and the amount of the additional request posed a problem. With regard to timing, we had essentially two alternatives: request an amendment to the fiscal year 1967 budget in the summer of 1966, while it was still before the Congress; or wait until early the following year and request a supplemental appropriation. Each of these alternatives had certain advantages and disadvantages.

The major disadvantage of waiting for a supplemental has been the need to reprogram, on a rather large scale, available fiscal year 1967 funds to meet our most urgent longer lead time procurement requirements, pending the availability of the additional funds. We recognize that this extensive reprogramming has placed an extra burden not only on the Defense Department but on the Armed Services Committees and the Defense Appropriations Subcommittees as well. Some of these reprogramming actions required the prior approval of this and other interested committees; all of them have been reported to the committees concerned. However, in order to facilitate your consideration of the fiscal year 1967 supplemental request we have prepared a recapitulation of all of the major procurement program adjustments affecting that fiscal year, which will be furnished separately.

Now, with a year and a half of combat experience in southeast Asia behind us, I believe that we have a much better understanding of our future requirements. In October 1965, when the fiscal year 1967 budget was being developed, we were in the midst of an explosive buildup in South Vietnam; it was then that we moved over 100,000 men 10,000 miles in less than 120 days. The future was impossible to predict with accuracy. In contrast, in October 1966, at the time of the preparation of the fiscal year 1968 program, we could look ahead to the time when our forces in southeast Asia could be expected to level off.

Since we can now project our requirements for the conflict in southeast Asia with far greater confidence than last year, we have changed our basic approach in preparing the fiscal year 1967 supplemental as well as the fiscal year 1968 budget. Sufficient funds are being requested in both the fiscal year 1967 supplemental and the fiscal year 1968 budget to protect the production lead time on all combat essential items until fiscal year 1969 funds would become available. Thus, if it later appears that the conflict will continue beyond June 30, 1968, we would be able to use fiscal year 1969 funds to order additional

ammunition for delivery after December 1968 and keep the production lines going without interruption.

In the case of tactical aircraft, which have a production lead time on the average of about 18 months, we have included sufficient funds in the fiscal year 1967 supplemental and the regular fiscal year 1968 budget to cover deliveries at rates sufficient to offset combat attrition in southeast Asia to January 1, 1970. If it later appears that all of such aircraft will not be required to replace combat attrition, the production of some might be cancelled and some used to modernize the forces at a faster rate than presently planned.

Similar provisions have been made in the fiscal year 1967 supplemental and the fiscal year 1968 budget for other categories of material which would be affected by the continuation of combat operations in southeast Asia beyond June 1968. Accordingly, barring a significant change in the character or scope of the southeast Asia conflict, or unforeseen emergencies elsewhere in the world, the fiscal year 1967 supplemental and fiscal year 1968 budget should be sufficient to cover our requirements until fiscal year 1969 funds become available, even if the conflict continues beyond June 30, 1968.

Because of the large demands of the southeast Asia conflict, I have deleted from both the fiscal year 1967 supplemental and the fiscal year 1968 budget, procurement funds which are required simply for the replacement of items already in the inventory with later models, except for tactical aircraft and helicopters and where the newer item is being procured to replace consumption. This type of marginal modernization can be safely deferred to a later time.

With regard to military construction, we have included funds in the fiscal year 1968 budget for military family housing and other categories of "noncombat" facilities, e.g., replacement of old barracks, BOQ's, maintenance shops, administration and school buildings, etc. We deferred these types of construction programs in fiscal year 1966 and 1967 in order to reduce our demand on an economy already laboring under inflationary pressures. Now that these pressures appear to be subsiding, we should be prepared to assume the orderly modernization and expansion of our physical plant, which represents an investment, in terms of acquisition cost, of well over \$35 billion. The rate at which we do so will depend upon economic developments during the next 12 to 18 months. In any event, we would first release the balance of the fiscal year 1966 military construction program (about \$565 million), and then move forward with the fiscal year 1968 program, for which a total of \$2,123 million has been included for military construction and \$267 million for the construction of military family housing.

Needless to say, we are continuing our cost reduction efforts with undiminished vigor. And, as you know, we have developed another list of base closings and consolidations, none of which will in any way affect our combat capabilities in southeast Asia or elsewhere.

By eliminating unneeded and marginal activities and deferring whatever can be safely deferred, I have been able to reduce the fiscal year 1967 supplemental and the fiscal year 1968 budget requests of the services and Defense agencies by about \$23.3 billion, while at the same time providing for all essential military requirements. We are requesting for fiscal year 1967 a total of \$72.8 billion in new obligational authority, of which \$12.3 billion is in the special supplemental

for southeast Asia. For fiscal year 1968 we are requesting a total of \$75.3 billion in new obligational authority. Expenditures are now estimated at \$67.95 billion for fiscal year 1967 (\$9.65 billion above the original budget estimate) and \$73.1 billion for fiscal year 1968.

IMPACT OF THE DEFENSE PROGRAM ON THE BALANCE OF PAYMENTS

During the past year the progress that the United States has been making in its efforts to eliminate the troublesome deficit in its international balances of payments was arrested. By 1965, the overall "liquidity" deficit was slightly over \$1.3 billion, down substantially from the \$2.8 billion level of the previous year, and we were hoping for a further improvement in 1966. However, we now expect that when final data are available for that year, they will show that on a liquidity basis the deficit was roughly the same as the year before. The chief factors in this development were some deterioration on the trade accounts stemming from the rapid domestic economic expansion during the period and higher Defense expenditures abroad.

As you know, for many years the Department of Defense has been making a vigorous effort to reduce the net impact of its program on the U.S. balance of payments while still maintaining all necessary combat capabilities and avoiding undue hardships for the individual serviceman or his dependents. Figure 1 summarizes the results of this effort over the fiscal year 1961-66 period.

FIGURE 1

[In billions]

	Fiscal year—					
	1961	1962	1963	1964	1965	1966
Expenditures:						
U.S. forces and their support (excluding increase in SEA expenditures over fiscal year 1961)	\$2.5	\$2.4	\$2.4	\$2.5	\$2.3	\$2.4
Military assistance .....	.3	.2	.3	.2	.2	.2
Other (AEC, etc.) .....	.3	.3	.3	.1	.1	.1
Total	3.1	3.0	3.0	2.8	2.6	2.6
Receipts	-.3	-.9	-1.4	-1.2	-1.3	-1.2
Net adverse balance (excluding increase in SEA expenditures over fiscal year 1961)	2.8	2.1	1.6	1.6	1.2	1.4
Increase in SEA expenditures over fiscal year 1961 .....			.1	.1	.2	.7
Net adverse balance	2.8	2.1	1.7	1.7	1.4	2.1

As you can see, between fiscal year 1961 and fiscal year 1965 we succeeded in reducing the net adverse balance on the "Defense" account by half, from \$2.8 billion to \$1.4 billion. This reduction was achieved through a dramatic rise in receipts from sales of U.S. military goods and services to foreign countries, coupled with a successful effort to hold down overseas expenditures in face of substantial increases in foreign prices and wages and in the pay of U.S. Defense Department personnel. For example, in Europe the cost of living went up about 16 percent and wage rates rose more than 30 percent. However, during fiscal year 1966 the requirements of the southeast Asia conflict, together with a modest though, hopefully, temporary decline in military sales receipts, combined to raise the net adverse balance to \$2.1 billion.

The major factor underlying this rise, of course, has been the war in Vietnam. Military expenditures abroad are closely related to the size of our deployments overseas. Between June 1965 and June 1966, the total number of U.S. military personnel in south Vietnam rose from 59,900 to 267,500, an increase of 207,600. In addition, it was necessary to undertake very large construction and logistics efforts in support of operations in southeast Asia, both of which added to the payments deficit. These additional foreign exchange costs were not unexpected (once the dimensions of our commitment there became apparent), and I reported to you a year ago that the conflict might raise such costs several hundred million dollars above prebuildup levels; indeed, we now estimate that there were approximately \$500 million of such additional expenditures in fiscal year 1966.

We recognized this threat to our balance of payments from the beginning and we have taken extraordinary measures to minimize its impact. Nevertheless, we must expect that the higher southeast Asia deployments planned over the next year and a half will inevitably cause our overseas spending to rise still higher in the months ahead. Indeed, it now appears that Vietnam-related foreign exchange costs in fiscal year 1967 will run over \$1 billion higher than the prebuildup year of fiscal year 1965.

In previous years I have described in some detail the Defense Department's actions to limit the balance of payments effects of our overseas programs, including:

The prompt withdrawal of U.S. forces from overseas areas whenever changes in circumstances, our own capabilities, or those of our allies permit such action.

A continuing review of the requirement for and the efficient utilization of overseas installations with a view to eliminating or consolidating these facilities in order to reduce their costs to a minimum.

Acceptance of up to 50 percent cost penalties (in some cases more) in order to favor procurement of U.S.-produced goods and services over those of foreign countries. Through fiscal year 1966, nearly \$300 million of such procurement was diverted to U.S. sources.

The virtual cessation of new offshore procurement for the military Assistance Program. In fiscal year 1966, expenditures for such procurement were less than a third the fiscal year 1963 level.

Efforts to encourage Defense Department personnel to reduce their overseas spending and, conversely, to increase their personal savings.

Sharp curbs on the size of U.S. headquarters staffs abroad and on the number of foreign national employees.

With the escalation of the conflict in southeast Asia, a number of special measures have been added. For example, in the area of personal spending, disbursement procedures were modified to make it easier for a serviceman to leave his pay "on the books" or increase the size of the allotment sent home. A most promising step was the enactment by the Congress last August of the uniform service savings deposit program which authorizes interest rates of up to 10 percent to encourage savings by servicemen overseas. We have initiated a vigorous educational program to complement this new savings oppor-

tunity and the results to date have been most encouraging. Total deposits under this legislation in the first 3 months (September–November 1966) totaled \$23.4 million.

In the construction area, special procedures have been put into effect to minimize the balance of payments costs of our large building program in southeast Asia, again with gratifying results to date. For example, during fiscal year 1966, only about one-fifth of the \$372 million paid our principal contractor in Vietnam entered the balance of payments. The rest in effect was "returned" to the United States to buy American goods and services, including transportation on U.S.-flag vessels. Most important, this was accomplished without impeding in any way the progress of the construction work itself.

With respect to military receipts, the decrease in fiscal year 1966 can be traced almost entirely to the phasing of actual receipts from the Federal Republic of Germany, with whom we have had an agreement to offset U.S. military expenditures in that country. The basic agreement called for the Germans to make payments in fiscal year 1966–67 of \$1,350 million for purchases of U.S. military goods and services required to meet their defense needs.

With regard to our military sales program, I have the impression that our policies and objectives in this area are not very well understood, either at home or overseas. For example, allegations have been made:

That we are forcing unwanted arms on countries.

That we are selling arms to countries which have no legitimate use for them and which could better use their scarce resources to improve the lot of their people.

That by indiscriminately selling arms, we are promoting the arms race and undermining the peace.

That in some cases our military sales efforts are thwarting the objectives of our own economic aid programs.

That our military sales efforts are motivated primarily by balance of payments considerations, abetted by the desire for profits on the part of U.S. manufacturers.

All of these allegations are false and are based on a misunderstanding or lack of knowledge of the facts involved. I believe it would be useful, therefore, to review briefly the background and origin of the present foreign military sales program.

It has been widely recognized in our country, at least since the Korean war, that the collective defense of the free world required armed allies, and somewhat more belatedly, that the internal security of most countries requires some armed forces. Circumstances of history, in particular the greatly weakened economic condition of most countries following World War II, forced on the United States the role of major armament supplier to the free world. Accordingly, during the decade of the 1950's, the United States had to meet the legitimate armament needs of its friends primarily through a large grant aid program. Indeed, of the \$22 billion of U.S. military exports during the 1950's, \$17 billion were financed by Congressional appropriations.

By the latter part of the decade, however, many of these countries had become prosperous again, enabling them to produce more of their own arms or buy them abroad. At the same time, this rising affluence allowed several of these countries to rebuild their monetary reserves.

Also, between fiscal year 1957 and the end of fiscal year 1961, the United States lost about \$5 billion of its gold holdings while its liquid liabilities to foreigners (which represent potential claims on our gold) had risen from about \$15 billion to about \$22 billion.

The increasing prosperity of many of our allies was reflected in our military assistance policies. Grant aid by fiscal year 1961 had already declined from an average annual level of \$2 billion plus during the 1950's to about \$1.5 billion. Since fiscal year 1961, this downward trend has continued with grant aid declining both absolutely and relatively. Whereas in fiscal year 1961, there were two dollars of grant aid for every dollar of military sales to foreign recipients, by fiscal year 1966 the ratio had been reversed. Moreover, I think it is important to note that, in terms of total value, U.S. military exports in the 10-year period, fiscal year 1962-71, are not expected to be measurably higher than in the decade, fiscal year 1952-61; the big change will be in the shift in the way these exports are financed—from grant aid in the 1950's to military sales in the 1960's.

With this shift in emphasis from grant aid to sales, it was decided to organize the latter on a more formal basis within the Department of Defense, indeed, to make it a separate program. The principal objective of this foreign military sales program is, however, basically the same as that of the grant aid program, i.e., to promote the defensive strength of our allies in a way consistent with our overall foreign policy objectives. Encompassed within this objective are several specific goals:

To further the practice of cooperative logistics and standardization with our allies by integrating our supply systems to the maximum extent feasible and by helping to limit proliferation of different types of equipment.

To reduce the costs, to both our allies and ourselves, of equipping our collective forces, by avoiding unnecessary and costly duplicative development programs and by realizing the economies possible from larger production runs.

To offset, at least partially, the unfavorable payments impact of our deployments abroad in the interest of collective defense.

Three basic standards were established to govern the conduct of our foreign military sales program:

We will not sell equipment to a foreign country which we believe it cannot afford or should not have.

We will never ask a potential foreign customer to buy anything not truly needed by its own forces.

We will not ask any foreign country to purchase anything from the United States, which it can buy cheaper or better elsewhere.

These standards are fully consistent with the spirit of the provision added to the Foreign Assistance Act last year, which calls for the sales program to be administered in such a way as to encourage reciprocal arms control and disarmament agreements and discourage arms races.

Over the next 5 years, we estimate that the countries of the non-Communist world will have legitimate requirements for substantial amounts of new military equipment. Based on past experience, we believe that many of these requirements can be most effectively met by purchases from us. However, our ability to realize this potential will depend on one major condition: we must convince our allies that

the U.S. military sales program is not a threat to their long-range national interests. And, as I mentioned previously, we must be willing, as a nation, to make military trade a "two way" street. For our part, the Defense Department will continue to take every opportunity to promote cooperative logistics arrangements—including cooperative research and development efforts—and to emphasize the important contribution which the sales program can make in furthering the objectives of collective defense.

Turning again to our international payments position, for the near term future, the prospects for any reduction in the net adverse balance on the "military" account must rest on an increase in sales receipts, and there are both practical and desirable limits as to how much relief we can or should expect from this source. In Europe, we should be able to make a net reduction in the size of our logistics support establishment in the process of relocating from France, although there will be some initial offsetting costs for the relocation itself. In the Far East, we will face continuing high foreign exchange costs as long as our Vietnam deployments remain large.

Let me assure the committee, however, that despite our preoccupation with the important national security objective we are charged with accomplishing, we remain keenly aware of the burden that our overseas programs place on the Nation's international balance of payments. In this regard, we have no intention of relaxing our efforts to make that burden as light as possible.

STRATEGIC FORCES

In this section of my statement I will discuss the three major programs which, together, constitute the foundation of our general nuclear forces, and civil defense. Because of their close interrelationship and, indeed, their interaction, it is essential that all three of these programs be considered within a single analytical framework.

THE GENERAL NUCLEAR WAR PROBLEM

During the past several years, in my annual appearances before this committee, I have attempted to explore with you some of the more fundamental characteristics of the general nuclear war problem and the kinds of strategic forces which it involves. I noted that our general nuclear war forces should have two basic capabilities:

To deter deliberate nuclear attack upon the United States and its allies by maintaining, continuously, a highly reliable ability to inflict an unacceptable degree of damage upon any single aggressor, or combination of aggressors, at any time during the course of a strategic nuclear exchange, even after absorbing a surprise first strike.

In the event such a war nevertheless occurred, to limit damage to our population and industrial capacity.

The first capability we call "assured destruction" and the second "damage limitation." The strategic offensive forces—the ICBM's, the submarine-launched ballistic missiles (SLBM's), and the manned bombers—which we usually associate with the first capability, can also contribute to the second. They can do so by attacking enemy delivery vehicles on their bases or launch sites, provided they can

reach those vehicles before they are launched at our cities. Conversely, the strategic defensive forces—manned interceptors, anti-bomber surface-to-air missiles, antiballistic missile (ABM)—which we usually associate with the second capability can also contribute to the first. They can do so by successfully intercepting and destroying the enemy's offensive weapons before they reach our strategic offensive forces on their bases and launch sites.

As long as deterrence of a deliberate Soviet (or Red Chinese) nuclear attack upon the United States or its allies is the overriding objective of our strategic forces, the capability for assured destruction must receive the first call on all of our resources and must be provided regardless of the costs and the difficulties involved. Damage limiting programs, no matter how much we spend on them, can never substitute for an assured destruction capability in the deterrent role. It is our ability to destroy an attacker as a viable 20th century nation that provides the deterrent, not our ability to partially limit damage to ourselves.

What kind and amount of destruction we would have to be able to inflict on an attacker to provide this deterrent cannot be answered precisely. However, it seems reasonable to assume that in the case of the Soviet Union, the destruction of, say, one-fifth to one-fourth of its population and one-half to two-thirds of its industrial capacity would mean its elimination as a major power for many years. Such a level of destruction would certainly represent intolerable punishment to any industrialized nation and, thus, should serve as an effective deterrent to the deliberate initiation of a nuclear attack on the United States or its allies.

Assured destruction with regard to Red China presents a somewhat different problem. China is far from being an industrialized nation. However, what industry it has is heavily concentrated in a comparatively few cities. We estimate, for example, that a relatively small number of warheads detonated over 50 Chinese urban centers would destroy half of the urban population (more than 50 million people) and more than one-half of the industrial capacity. Moreover, such an attack would also destroy most of the key governmental, technical and managerial personnel and a large proportion of the skilled workers. Since Red China's capacity to attack the United States with nuclear weapons will be very limited, even during the 1970's, the ability of even a very small portion of our strategic offensive forces to inflict such heavy damage upon them should serve as an effective deterrent to the deliberate initiation of such an attack on their part.

Once sufficient forces have been procured to give us high confidence of achieving our assured destruction objective, we can then consider the kinds and amounts of forces which might be added to reduce damage to our population and industry in the event deterrence fails. But here we must note another important point, namely, the possible interaction of our strategic forces programs with those of the Soviet Union. If the general nuclear war policy of the Soviet Union also has as its objective the deterrence of a U.S. first strike (which I believe to be the case), then we must assume that any attempt on our part to reduce damage to ourselves (to what they would estimate we might consider an "acceptable level") would put pressure on them to strive for an offsetting improvement in their deterrent forces. Conversely, an increase in their damage limiting capability would

require us to make greater investments in assured destruction, which, as I will describe later, is precisely what we now propose to do.

It is this interaction between our strategic forces programs and those of the Soviet Union which leads us to believe that there is a mutuality of interests in limiting the deployment of antiballistic missile defense systems. If our assumption that the Soviets are also striving to achieve an assured destruction capability is correct, and I am convinced that it is, then in all probability all we would accomplish by deploying ABM systems against one another would be to increase greatly our respective defense expenditures, without any gain in real security for either side. It was for this reason that President Johnson decided to initiate negotiations with the Soviet Union, designed, through formal or informal agreement, to limit the deployment of ABM systems, while including at the same time about \$375 million in his fiscal year 1968 budget to provide for such actions—e.g., protection of our offensive weapon systems—as may be required if these discussions prove unsuccessful.

In this connection, it might be useful to reiterate another fundamental point, namely, that the concept of assured destruction implies a "second strike" capability, i.e., a strategic force of such size and sufficient strength to destroy the attacker. Thus if assured destruction is also a Soviet objective, they must always view our strategic offensive forces in their planning as a potential first strike threat (just as we view their forces) and provide for a second strike capability.

THE SIZE AND CHARACTER OF THE THREAT

In order to assess the capabilities of our general nuclear war forces over the next several years, we must take into account the size and character of the strategic forces which the Soviet Union and Red China are likely to have during the same period. Again, let me caution that, while we have reasonable high confidence in our estimates for the close-in period, our estimates for the early part of the next decade are subject to much uncertainty. As I pointed out in past appearances before this committee, such longer range projections are, at best, only informed estimates particularly since they deal in many cases with a period beyond the production and deployment leadtimes of the weapon systems involved.

The Soviet strategic offensive-defensive forces

Two significant changes have occurred during the last year in our projections of Soviet strategic forces. The first is a faster than expected rate of construction of hard ICBM silos; the second is more positive evidence of a deployment of an antiballistic missile defense system around Moscow. (Both of these developments fall considerably short of what we assumed in the "higher than expected" threat, against which we have been hedging for several years.) Our current estimates for other elements of the Soviet strategic forces are generally in line with those I discussed here last year.

Summarized in the following table are the Soviet's strategic offensive forces estimated for October 1, 1966. Shown for comparison are the U.S. forces.

United States versus Soviet intercontinental strategic nuclear forces

	Oct. 1, 1966	
	U.S. ¹	U.S.S.R.
ICBM's ²	934	340
SLBM's (UE launchers) ³	512	130
Total intercontinental ballistic missiles ⁴	1,446	470
Intercontinental bombers ⁵	680	155

¹ These are mid-1966 figures.

² Excludes test range launchers and Soviet MR/IRBM's capable of striking Eurasian targets.

³ In addition to the SLBM's, the Soviets possess submarine-launched cruise missiles whose primary targets are naval and merchant vessels.

⁴ In 1965, intelligence reports estimated Soviet intercontinental missiles as of mid-1966 to number between 430 and 500.

⁵ In addition to the intercontinental bombers shown in the table, the Soviets possess medium bombers capable of striking Eurasian targets.

Intercontinental ballistic missiles. As of now, we have more than three times the number of intercontinental ballistic missiles (i.e., ICBM's, and SLBM's) the Soviets have. Even by the early 1970's, we still expect to have a significant lead over the Soviet Union in terms of numbers and a very substantial superiority in terms of overall combat effectiveness. In this connection, we should bear in mind that it is not the number of missiles which is important, but rather the character of the payloads they carry; the missile is simply the delivery vehicle. Our superiority in intercontinental bombers, both in numbers and combat effectiveness, is even greater and is expected to remain so for as far ahead as we can see. There is still no evidence that the Soviets intend to deploy a new heavy bomber in the late 1960's.

Antiballistic missile defense. We have been aware for many years that the Soviets have been working on an antiballistic missile defense system, just as we have been. After a series of abortive starts, it now appears that the Soviets are deploying such a system (using the "GALOSH" missile, publicly displayed in 1964) around Moscow. They are also deploying another type of defensive system elsewhere in the Soviet Union, but the weight of the evidence at this time suggests that this system is not intended primarily for antiballistic missile defense. However, knowing what we do about past Soviet predilections for defense systems, ¹ we must for the time being, plan our forces on the assumption that they will have deployed some sort of an ABM system around their major cities by the early 1970's. Whether made up of GALOSH only, or a combination of GALOSH and other types of missiles, a full scale deployment would cost the Soviet Union at least \$20 to \$25 billion.

The Red Chinese nuclear threat

There has been no basic change in our estimates for the Red Chinese nuclear threat. Their firing of a nuclear armed missile over a distance of a few hundred miles last October falls within the limits of that estimate.

¹ The Soviets for more than a decade have spent substantially more on air defense against strategic bombers than has the United States. But if our Strategic Air Command is correct in its judgment that a very high proportion of the U.S. incoming bombers could penetrate the Soviet defenses and reach their targets, and I have no reason to dispute it, then we must conclude that the bulk of these Soviet expenditures has been wasted.

With regard to an ICBM, we believe that the Red Chinese nuclear weapons and ballistic missile development programs are being pursued with high priority. On the basis of recent evidence, it appears possible that they may conduct either a space or a long-range ballistic missile launching before the end of 1967. However, it appears unlikely that the Chinese could deploy a significant number of operational ICBM's before the mid-1970's, or that those ICBM's would have great reliability, speed of response, or substantial protection against attack.

Red China also has some bombers which could carry nuclear weapons, but most of them have an operational radius of only a few hundred miles. It is highly unlikely, on the basis of cost alone, that they would undertake the development, production, and deployment of a new, long-range bomber force. If they chose to do so, it would take them a decade or more before they could deploy it. Accordingly, we have no reason on this account to change our estimate that a significant Red Chinese nuclear threat to the continental United States will not develop before the mid-1970's.

CAPABILITIES OF THE PROPOSED FORCES FOR ASSURED DESTRUCTION

The most demanding test of our assured destruction capability is the ability of our strategic offensive forces to survive a well coordinated surprise Soviet first strike directed against them. Because no one can know how a general nuclear war between the United States and the Soviet Union might occur, prudence dictates that we design our own strategic forces on the basis of a greater threat than we actually expect.

Capability against the expected threat

Even if the Soviets in the 1972 period were to assign their entire available missile force to attacks on our strategic forces (reserving only refire missile and bomber-delivered weapons for urban targets), more than one-half of the total forces programed last year for 1972 would still survive and remain effective.

Considering the overall size and character of that force, it is clear that our strategic missiles alone could destroy the Soviet Union as a viable 20th century society, even after absorbing a well coordinated, surprise first attack. Indeed, the detonation of even one-fifth of the total surviving weapons over Soviet cities would kill about 30 percent of the total population (73 million people) and destroy about one-half of the industrial capacity. By doubling the number of warheads delivered, Soviet fatalities and industrial capacity destroyed would be increased by considerably less than one-third. Beyond this point further increments of warheads delivered would not appreciably change the result, because we would have to bring smaller and smaller cities under attack, each requiring one delivered warhead.

Although it is not at all certain that they will do so, we must, as I noted earlier, base our force planning on the assumption that the Soviets will deploy a reasonably effective ABM defense around their principal cities; and we must be prepared to overwhelm it.

We have been hedging against this possibility for some time, and last year we took a number of actions of which the following are the most important:

Accelerated development of the Poseidon missile.

Approved production and deployment of Minuteman III.

Developed penetration aids for Minuteman.

Now in the fiscal year 1968 program we propose to take a number of additional actions to enhance the future capabilities of our assured destruction forces, of which the following are the more important:

Produce and deploy the Poseidon missile.

Produce and deploy improved missile penetration aids.

Increase the proportion of Minuteman III in the planned force and provide it with an improved third stage.

Initiate the development of new reentry vehicles, specifically designed for use against targets heavily defended with ABM's.

I will discuss each of these actions in greater detail later in connection with our other proposals for the strategic forces. But for now, let me point out that the net effect of these actions would be to increase greatly the overall effectiveness of our assured destruction force against the Soviet Union by mid-1972. Even if the Moscow-type ABM defense were deployed at other cities as well, the proposed U.S. missile force alone could inflict about 35 percent (86 million) fatalities on the Soviet Union in 1972—after absorbing a surprise attack.

As I noted earlier, a relatively small number of warheads detonated over 50 cities would destroy half of Red China's urban population and more than one-half of her industry.

Thus the strategic missile forces proposed for the fiscal year 1968-72 period would, by themselves, give us an assured destruction capability against both the Soviet Union and Red China, simultaneously.

Capability against "higher than expected threats"

As I indicated last year, our assured destruction capability is of such crucial importance to our security that we must be prepared to cope with Soviet strategic threats which are greater than those projected in the latest intelligence estimates.

The most severe threat we must consider in planning our assured destruction forces is an extensive, effective Soviet ABM deployment combined with a deployment of a substantial ICBM force with a hard-target kill capability. Such a Soviet offensive force might pose a threat to our Minuteman missiles. An extensive, effective Soviet ABM system might then be able to intercept and destroy a significant portion of our residual missile warheads, including those carried by submarine-launched missiles. (The Soviet offensive and defensive threats assumed here are both substantially higher than expected.)

To hedge against the possibility of such a threat to our land-based missile forces, we have authorized the development and production of the Poseidon. Should still additional offensive power be required, and such a requirement is not now clear, we are considering the development and deployment of a new Advanced ICBM, designed to reduce vulnerability to such a Soviet threat. The deployment of the Nike-X as a defense for our Minuteman force would offer a partial substitute for the possible further expansion of our offensive forces.

But again I want to emphasize that we don't know whether the Soviet Union will develop and deploy the kind of forces assumed

here. Even against this higher than expected threat, and even without a Nike-X defense of Minuteman, our proposed strategic missile and bomber forces could still inflict 40 percent or more fatalities on the Soviet population throughout the time period involved.

More extreme threats are highly unlikely. In any event, the changes we are now proposing in our strategic offensive forces would make it dangerous and expensive for the Soviet Union to move in the direction of more extreme threats to our assured destruction capability. If we assume, as I believe we should, that the Soviets would want to reduce the vulnerability of their own offensive forces against the possibility of a first strike by our very accurate forces in the fiscal year 1972-73 period, they must further disperse and harden their strategic missiles, which is exactly what they appear to be doing now. To do so is expensive and for the same budget outlay results in reduced missile payloads. Not to do so would leave the Soviet force highly vulnerable. Thus we can, in planning our forces, foreclose any seemingly "easy" and "cheap" paths to their achievement of a satisfactory assured destruction capability and a satisfactory damage limiting capability at the same time.

We of course, cannot preclude the possibility that the Soviet Union may increase its strategic forces budget at some time in the future. That is why we are now undertaking a very comprehensive study of a new strategic missile system. And that is why we are not precluding the possible future construction of new Poseidon submarines or the defense of our presently deployed Minuteman silos with Nike-X. While I believe we should place ourselves in a position to move forward promptly on all of these options if later that should become necessary, we need not commit ourselves to them now.

CAPABILITIES OF THE PROPOSED FORCES FOR DAMAGE LIMITATION

The principal issue in this area of the strategic forces program concerns the deployment of an ABM defense system, i.e., Nike-X. There are three somewhat overlapping but distinct major purposes for which we might want to deploy such a system at this time:

To protect our cities (and their population and industry) against a Soviet missile attack.

To protect our cities against a Red Chinese missile attack in the mid-1970's.

To help protect our land-based strategic offensive forces (i.e., Minuteman) against a Soviet missile attack.

After studying the subject exhaustively, and after hearing the views of our principal military and civilian advisors, we concluded that we should not initiate an ABM deployment at this time for any of these purposes. We believe that:

The Soviet Union would be forced to react to a U.S. ABM deployment by increasing its offensive nuclear force still further with the result that the risk of a Soviet nuclear attack on the United States would not be further decreased; and the damage to the United States from a Soviet nuclear attack in the event deterrence failed, would not be reduced in any meaningful sense.

As I noted earlier, the foundation of our security is the deterrence of a Soviet nuclear attack. We believe such an attack can be prevented if it is understood by the Soviets that we possess strategic nuclear

forces so powerful as to be capable of absorbing a Soviet first strike and surviving with sufficient strength to impose unacceptable damage on them. We have such power today. We must maintain it in the future, adjusting our forces to offset actual or potential changes in theirs.

There is nothing we have seen in either our own or the Soviet Union's technology which would lead us to believe we cannot do this. From the beginning of the Nike-Zeus project in 1955 through the end of this current fiscal year, we will have invested a total of about \$4 billion on ballistic missile defense research—including Nike-Zeus, Nike-X and Project Defender. And, during the last 5 or 6 years, we have spent about \$1.2 billion on the development of penetration aids to help ensure that our missiles could penetrate the enemy's defenses. As a result of these efforts, we have the technology already in hand to counter any offensive or defensive force changes the Soviet Union might undertake in the foreseeable future.

We believe the Soviet Union has essentially the same requirement for a deterrent or assured destruction force as the United States. Therefore, deployment by the United States of an ABM defense which would degrade the destruction capability of the Soviet's offensive force to an unacceptable level would lead to expansion of that force. This would leave us no better off than we were before.

With respect to protection of the United States against a possible Red Chinese nuclear attack, the lead time required for China to develop a significant ICBM force is greater than that required for deployment of our defense—therefore the Chinese threat in itself would not dictate the production of an ABM system at this time.

Similarly, although the protection of our land-based strategic offensive forces against the kind of heavy, sophisticated missile attack the Soviets may be able to mount in the mid- or late 1970's might later prove to be worth while, it is not yet necessary to produce and deploy the Nike-X for that purpose.

I have already discussed, in connection with my review of the capabilities of our strategic forces for assured destruction, the third major purpose for which we may want to deploy an ABM defense (i.e., the protection of Minuteman). Now I would like to discuss the other two purposes.

Deployment of Nike-X for defense of our cities against a Soviet attack

What is involved here is an analysis of the contribution the Nike-X system might make to the defense of our cities under two assumptions:

That the Soviets do not react to such a deployment.

That the Soviets do react in an attempt to preserve their "assured destruction" capability.

As you know, the major elements of the Nike-X system are being developed in such a way as to permit a variety of deployments; two have been selected for the purposes of this analysis. The first, which I will call "posture A," represents a light U.S. defense against a Soviet missile attack on our cities. It consists of an area defense of the entire continental United States, providing redundant (overlapping) coverage of key target areas; and, in addition, a relatively low-density Sprint defense of a number of the largest cities to provide some protection against those warheads which get through the area defense.

The second deployment, which I call "posture B," is a heavier defense against a Soviet attack. With the same area coverage, it provides a higher-density Sprint defense for twice the number of cities.

Shown on the figure 2 are the components and the costs (which, if past experience is any guide, may be understated by 50 to 100 per cent for the systems as a whole) ² of posture A and posture B.

FIGURE 2

Investment cost

[In billions]

	Posture A	Posture B
Radars:		
MAR		
TACMAR		
PAR		
MSR		
Investment cost.....	\$6.5	\$12.6
Missiles:		
Spartan		
Sprint		
Investment cost.....	2.4	4.8
DOD investment cost.....	8.9	17.4
AEC investment cost.....	1.0	2.0
Total investment cost (excluding R. & D.).....	9.9	19.4
Annual operating cost.....	.38	.72
Number of cities with terminal deficiencies.....	X	2X

The multifunction array radar (MAR) is a very powerful phased-array radar which can perform all the defense functions involved in engaging a large, sophisticated attack: central control and battle management, long-range search, acquisition of the target, discrimination of warheads from decoys or "spoofing" devices, precision tracking of the target, and control of the defense interceptor missiles.

The TACMAR radar is a scaled down, slightly less complex and less powerful version of the MAR, which can perform all the basic defense functions in a smaller, less sophisticated attack.

The perimeter acquisition radar (PAR) is a phased-array radar required for the very long-range search and acquisition functions involved in area defense. To achieve the full potential of the extended range Spartan, the target must be picked up at much greater distances in order to compute its trajectory before the Spartan is fired.

The missile site radar (MSR) is a much smaller, phased-array radar needed to control the Sprint and Spartan interceptor missiles during an engagement. It can also perform the functions of the TACMAR but on a considerably reduced scale. Actually, a number of different sizes are being studied. This "modular" approach will permit us to tailor the capacity of the radar to the particular needs of each defended area.

The Spartan is a three-stage missile with a nuclear warhead capable of intercepting incoming objects at relatively long range above the atmosphere.

Even before the systems became operational, pressures would mount for their expansion at a cost of still additional billions. The unprotected, or relatively unprotected, areas of the United States would claim that their tax dollars were being diverted to protect New York and Washington while they were left naked. And critics would point out that our strategic offensive force is premised on a much larger Soviet threat (the "possible," not the "probable" threat); they would conclude that the same principles should be applied to our strategic defensive forces. For these and other reasons, I believe that, once started, an ABM system deployed with the objective of protecting the United States against the Soviet Union would require an expenditure on the order of \$40 billion over a 10-year period.

The Sprint is a shorter range, high-acceleration interceptor missile designed to make intercepts at lower altitudes.

The technical principles involved in the radars are now fairly well established. One research and development MAR-type has been constructed at the White Sands Missile Range. A contract has been let for the power plant of a second MAR-type radar, which is to be constructed on Kwajalein Atoll. The missile site radar is well along in development and the construction of one of these radars on Kwajalein Atoll has also begun.

Testing of the Sprint missile was started at White Sands in November 1965 and the tempo of testing will steadily increase during the current year. The Spartan is still on the drawing boards. It represents a very substantial redesign of the original Zeus and we will not know until it is flight tested how well it will perform.

Facilities for testing both the Sprint and the Spartan will be constructed on Kwajalein Atoll. These, together with the TACMAR and MSR and the programs for the computers, will give us all of the major elements of the Nike-X system which are essential to test its overall performance against reentry vehicles fired from Vandenberg AFB, Calif. (We feel we know enough about the PAR technology to be able to use the mechanically steered radars already on Kwajalein as simulators.) The system will be tested in stages, starting with the MSR and Sprint, then the Spartan missile and the TACMAR radar. A large number of test shots will be launched from the west coast of the United States to Kwajalein to test the system thoroughly as a whole. The most important objective of this effort is to determine proper system integration and computer programming, since the individual components of the system will have already been tested.

But even after this elaborate test program is completed, some technical uncertainties will still remain unresolved; this is to be expected in a system designed for such a highly complex mission. Moreover, we have learned from bitter experience that even when the development problems have been solved, a system can run into trouble in production or when it is put into operation. All too often the development prototype cannot be produced in quantity without extensive reengineering. Production delays are encountered and costs begin to spiral. Sometimes these problems are not discovered until the new system actually enters the inventory and has to function in an operational environment.

In this connection, it is worth noting that had we produced and deployed the Nike-Zeus system proposed by the Army in 1959 at an estimated cost of \$13 to \$14 billion, most of it would have had to be torn out and replaced, almost before it became operational, by the new missiles and radars of the Nike-X system. By the same token, other technological developments in offensive forces over the next 7 years may make obsolete or drastically degrade the Nike-X system as presently envisioned. We can predict with certainty that there will be substantial additional costs for updating any system we might consider installing at this time against the Soviet missile threat.

The deployment of a Nike-X system would also require some improvement in our defense against manned bomber attack in order to preclude the Soviets from undercutting the Nike-X defense; and we would want to expand and accelerate the fallout shelter program. The investment cost (including research and development) of the former is

estimated at about \$1.5 to \$2.4 billion and would provide for a small force of F-111 or F-12 type interceptors and airborne warning and control aircraft (AWACS). The expanded fallout shelter program would cost about \$800 million more than the one we are now producing. We would also need some of our antisubmarine warfare (ASW) forces for use against Soviet missile submarines, but we are not yet clear whether these ASW forces would actually have to be increased over the currently planned levels. In any event, the "current" estimates of the investment cost of the total damage limiting package would amount to at least \$12.2 billion for posture A and at least \$21.7 billion for posture B.

To test the contribution that each of these Nike-X deployments might make to our damage limiting objectives, we have projected both the United States and Soviet strategic nuclear forces (assuming no reaction by the Soviets to the U.S. ABM deployment) to the time when posture B, the heavier defense, could be fully in place.

The fatalities which these Soviet forces could inflict upon the United States (with and without a U.S. ABM defense) and the fatalities which the U.S. forces could inflict on the Soviet Union (with a Soviet ABM defense) are shown in the figure 3.

FIGURE 3

Number of fatalities¹ in an all-out strategic exchange (assumes no Soviet reaction to U.S. ABM deployment)

[In millions]²

	Soviets strike first, United States retaliates		United States strikes first, Soviets retaliate ³	
	U.S. fatalities	Soviet fatalities	U.S. fatalities	Soviet fatalities
U.S. programs:				
Approved.....	120	120+	100	70
Posture A.....	40	120+	30	70
Posture B.....	30	120+	20	70

¹ Fatality figures shown above represent deaths from blast and fallout; they do not include deaths resulting from fire, storms, disease, and general disruption of everyday life.

² The data in this table are highly sensitive to small changes in the pattern of attack and small changes in force levels.

³ Assumes United States minimizes U.S. fatalities by maximizing effectiveness of strike on Soviet offensive systems.

The first case, "Soviets Strike First, United States Retaliates," is the threat against which our strategic forces must be designed. The second case, "United States Strikes First, Soviets Retaliate," is the case that would determine the size and character of the Soviet reaction to changes in our strategic forces, if they wish, as they clearly do, to maintain an assured destruction capability against us.

These calculations indicate that without Nike-X and the other damage limiting programs discussed earlier, U.S. fatalities from a Soviet first strike could total about 120 million; even after absorbing that attack, we could inflict on the Soviet Union more than 120 million fatalities. Assuming the Soviets do not react to our deployment of an ABM defense against them, which is a most unrealistic assumption, posture A might reduce our fatalities to 40 million and posture B to about 30 million.

Although the fatality estimates shown for both the Soviet Union and the United States reflect some variations in the performance of their respective ABM systems, they are still based on the assumption that these systems will work at relatively high levels of effectiveness. If these ABM systems do not perform as well as our technical people postulate, fatalities on both sides could be considerably higher than shown in figure 3, or the costs would be considerably higher if major improvements or additions had to be made in the systems to bring them up to the postulated level of performance.

If the Soviets are determined to maintain an assured destruction capability against us and they believe that our deployment of an ABM defense would reduce our fatalities in the "United States Strikes First, Soviets Retaliate" case to the levels shown in figure 3, they would have no alternative but to increase the second strike damage potential of their offensive forces. They could do so in several different ways. Shown in the table below are the relative costs to the Soviet Union of responding to a U.S. ABM deployment in one of these possible ways:

Level of U.S. fatalities which Soviets believe will provide deterrence¹

Fatalities (millions):	Cost to the Soviets of offsetting U.S. cost to deploy an ABM
40-----	\$1 Soviet cost to \$4 U.S. cost.
60-----	\$1 Soviet cost to \$2 U.S. cost.
90-----	\$1 Soviet cost to \$1 U.S. cost.

¹ U.S. fatalities if United States strikes first and Soviets retaliate.

If the Soviets chose to respond in that way to our ABM deployment the results would be as shown in figure 4.

In short, the Soviets have it within their technical and economic capacities to offset any further damage limiting measures we might undertake provided they are determined to maintain their deterrent against us. It is the virtual certainty that the Soviets will act to maintain their deterrent which casts such grave doubts on the advisability of our deploying the Nike-X system for the protection of our cities against the kind of heavy, sophisticated missile attack they could launch in the 1970's. In all probability, all we would accomplish would be to increase greatly both their defense expenditures and ours without any gain in real security to either side.

Defense against the Red Chinese nuclear threat

With regard to the Red Chinese nuclear threat, an austere ABM defense might offer a high degree of protection to the nation against a missile attack, at least through the 1970's. The total investment cost of such a program might amount to \$3.5 billion, including the cost of the nuclear warheads.

FIGURE 4

Number of fatalities in an all-out strategic-exchange (assumes Soviet reaction to U.S. ABM deployment)

[In millions]

	Soviets strike first, United States retaliates		United States strikes first, Soviets retaliate	
	U.S. fatalities	Soviet fatalities	U.S. fatalities	Soviet fatalities
U.S. programs:				
Approved (no response).....	120	120+	100	70
Posture A.....	120	120+	90	70
Posture B.....	120	120+	90	70

The effectiveness of this deployment in reducing U.S. fatalities from a Red Chinese attack in the 1970's is shown in the table below:

Chinese strike first (Operational inventory)

	X missiles	3X missiles
U.S. fatalities (in millions):		
Without ABM.....	5	10
With ABM.....	0+	1

This austere defense could probably preclude damage in the 1970's almost entirely. As the Chinese force grows to the level it might achieve by 1980-85, additions and improvements might be required, but relatively modest additional outlays could probably limit the Chinese damage potential to low levels well beyond 1985.

It is not clear that we need an ABM defense against China. In any event, the lead time for deployment of a significant Chinese offensive force is longer than that required for U.S. ABM deployment; therefore, the decision for the latter need not be made now.

In the light of the foregoing analysis, we propose:

To pursue with undiminished vigor the development, test and evaluation of the Nike-X system (for which purpose a total of about \$440 million has been included in the fiscal year 1968 budget), but to take no action now to deploy the system.

To initiate negotiations with the Soviet Union designed, through formal or informal agreement, to limit the deployment of ABM systems.

To reconsider the deployment decision in the event these discussions prove unsuccessful; approximately \$375 million has been included in the fiscal year 1968 budget to provide for such actions as may be required at that time, e.g., the production of Nike-X for the defense of our offensive weapon systems.

I would now like to turn to our specific proposals for the strategic forces in the fiscal year 1968-72 period.

STRATEGIC OFFENSIVE FORCES

The force structure proposed for the fiscal year 1968-72 period is shown in the classified table furnished to the committee.

Missile forces

Last year I told this committee that:

The U.S. response to a Soviet deployment of an ABM defense would be the incorporation of appropriate penetration aids in our strategic missiles. Against area defense interceptors, penetration aids can be provided for U.S. missiles (so that an assured destruction capability is maintained) at a cost to us of less than 10 percent of the cost of an ABM defense to the Soviets. The leadtime for the Soviets to mount an ABM defense is greater than the time for us to produce and deploy penetration aids, provided we take timely action to develop them and can move forward promptly to produce them, and this we are doing. The decision actually to deploy new penetration aids can be made later this year. If the Soviets did attempt a large ABM defense we would still be able to produce and install the necessary penetration aids before the Soviets could achieve an extensive deployment.

* * * against a combined Soviet expanded strategic missile/ABM threat, the most efficient alternative available to us would be to develop Poseidon (with the new penetration aids) and retrofit it into Polaris boats. To hedge against the possibility of such a threat, we now propose to accelerate the development of the Poseidon missile (which was initiated last year). The timing of a decision to produce and deploy the missile would depend upon how this threat actually evolved.

This is essentially the program we now propose to pursue.

Minuteman. Last year we had planned a Minuteman force which would ultimately have consisted of a mix of 1,000 Minuteman II's and Minuteman III's with all the Minuteman I's phased out. Now, in order to increase the capability of this force against a possible strong Soviet ABM defense, we propose to increase the proportion of Minuteman III's in the force and equip them with a new improved third stage which will increase the payload of each missile. This increased payload will enable the Minuteman III to carry more penetration aids to counter an ABM defense. The total cost of this program is estimated at \$400 million, but it will cost the Soviet Union many times more in ABM defenses if they try to offset it.

We also propose to step up the schedule for reequipping the Minuteman II's with an improved reentry vehicle and to procure penetration aid packages for all Minuteman II and III missiles. Engineering development was started on these penetration aid packages last year. The total cost of this program is estimated at \$315 million, of which \$100 million was provided through fiscal year 1967, \$125 million is required in fiscal year 1968, and another \$90 million in subsequent years.

Eventually, it will probably become necessary to replace the earliest Minuteman II missiles because of their age. At that time we could add more Minuteman III's if that should appear desirable. Meanwhile, I believe we should initiate the development of a new improved reentry vehicle for the Minuteman III, and funds for this purpose have been included in the budget request.

Polaris-Poseidon. By the end of the current fiscal year, 39 of the planned 41-ship Polaris force will have become operational. The last two Polaris submarines will be deployed by September 1967.

I also believe it would be prudent at this time to commit the Poseidon missile to production and deployment. In order to hold to a minimum the number of submarines which would have to be withdrawn from the operational fleet, we propose to spread the Poseidon retrofit program over a period of years on a schedule tied to the regular overhaul cycle.

The total incremental cost of developing Poseidon, and producing and deploying the proposed force is estimated at \$3.3 billion. A total of about \$900 million is included in the fiscal year 1968 budget for Poseidon. (The decision to deploy Poseidon will produce an off-setting saving of about \$200 million in the Polaris program.)

Funds have also been included in the budget for the development of certain desired improvements for the Polaris missile.

Titan II. The Titan II force, consisting of 54 missiles deployed in hard silos, presently makes a unique contribution to our strategic offensive capabilities. However, with the deployment of Minuteman III and, later, of the Poseidon, this capability of the Titan II will no longer be unique. The Minuteman III from the continental United States and the Poseidon from forward undersea locations will be able to reach all the important targets in the Soviet Union.

Accordingly, we now propose to end procurement of new Titan boosters for testing and operational reliability demonstration with the fiscal year 1966 buy, and, instead, use boosters already in the inventory for these purposes in the future. With about six follow-on tests per year, the force of 54 Titan missiles on launchers can be maintained for a number of years.

New strategic missile systems. Although we believe the strategic missile programs now proposed will be adequate to meet the threat, even if the Soviet Union were to carry out a full scale deployment of an ABM system and develop more effective ICBM's, we are making a very comprehensive study of a new long-range missile system. To shorten the lead time on any option selected as a result of this study, we have included funds in the FY 1968 Budget for contract definition should such a decision become warranted.

Strategic bomber forces

The manned bomber forces we propose to maintain through fiscal year 1972 are the same as those I presented here last year for the fiscal year 1967-71 period. The B-52C-F's and B-58's will be phased out as planned, leaving a force of 255 B-52G-H's and 210 FB-111A's.

Since the new FB-111's with the SRAM air-to-surface missile will be entering the bomber force during fiscal year 1969-71 and the B-52G/H's can be maintained in a suitable operational condition well into the 1970's, there is no pressing need to decide on the production and deployment of a new bomber in the fiscal year 1968 budget. Clearly, the first order of business in the strategic offensive forces program at this time is the provision of penetration aids and other improvements for our presently planned strategic missile force, and the production and deployment of the new Poseidon. Nevertheless, we plan to continue work on the engine, avionics, and the related airframe studies, for which a total of \$26 million is programmed for fiscal year 1968.

Air launched missiles

Last year I said that we planned to keep the Hound Dog missiles in the operational inventory through fiscal year 1970, phasing their number down in step with the phase out of the B-52C-F's. We now propose to phase out the older Hound Dog "A" by end of fiscal year 1968, retaining only the "B" models.

The SRAM program is unchanged from that which I presented last year. While we still do not plan to deploy SRAM on the B-52G/H's, we are continuing the development of the necessary avionics to permit such a deployment if it should become desirable.

Strategic reconnaissance

The strategic reconnaissance force is the same as that presented a year ago.

STRATEGIC DEFENSIVE FORCES

The strategic defensive forces proposed for the fiscal years 1968-72 period are shown on the classified table provided to the committee. The civil defense program for fiscal year 1968 is shown separately.

Surveillance, warning, and control

The programs shown under this heading are, with two exceptions, the same as those I presented last year. Activation of BUIC III control centers will slip somewhat from the schedule shown last year due to delays in firming up the technical details of the program. The delay will be made up by the temporary retention of two of the BUIC II control centers and 12 of the manual backup centers through fiscal year 1968. By end of fiscal year 1969 all 19 BUIC III's should be operational and the remaining BUIC II and manual control centers will be phased out.

The second change pertains to the search radars. Last year we had planned to reduce the number of these radars to 151 by end fiscal year 1967. As you may recall, this reduction was predicated on the internetting of our radar system with that of the Federal Aviation Agency (FAA). However, in order to make the inputs from the FAA radars compatible with the SAGE-BUIC III system, they must first be converted into appropriate computer language by a special piece of equipment called a "digitizer." Because of a slippage in the production of this digitizer, five more Defense Department radars will have to be operated until fiscal year 1969, when we expect to be able to reduce the number to 149.

Manned interceptors

The manned interceptor forces are generally the same as those presented last year.

As you know, we have been studying during the past several years various ways of modernizing our air defense forces. Interceptor versions of both the SR-71 (F-12) and the F-111 have been considered for this role. Either one, equipped with the improved ASG-18/AIM 47 fire control and missile system and used with an effective airborne warning and control system (AWACS), would be better than the present interceptors in operating from degraded bases and independently of the vulnerable fixed ground environment, and in countering concentrated bomber attacks, including air-to-surface missiles. In fact, a small force of such aircraft operating with AWACS would have a combat capability superior to the programmed force of several hundred Century series fighters and the hundreds of ground radar and control sites.

The feasibility of this plan, however, depends upon the successful development of the AWACS. We now have a test program under way to examine three proposed solutions to the problem of developing an

overland airborne radar which could provide effective coverage at all altitudes. Design efforts are also being pursued on the airframe and avionics. We hope that by the end of this year sufficient data will be available to demonstrate the feasibility of the AWACS. Only then will we be in a position to make a decision on the interceptor force. Accordingly, we propose to continue development work on both the F-12 and the F-111 types of interceptors and on the fire control and missile systems, and \$20 million is included in the fiscal year 1968 budget for this purpose. Although no additional funds are requested for work on the AWACS airframe, another \$10 million is included in the fiscal year 1968 budget to continue work on overland radar technology.

Surface-to-air missiles

The Nike Hercules and Hawk missile forces are the same as planned a year ago except that we now intend to replace eventually some of the present Hawk missiles with the new Improved Hawk which is now in development.

In addition to the improved Hawk, which is designed primarily for the field forces, we also have in advanced development a new surface-to-air missile called the SAM-D. While this system is also primarily oriented toward air defense of the field forces, it also has a potential application for continental air defense. This effort, thus far, has been directed mainly to development of the required components or "building blocks" and a deployment decision at this time would be premature. Additional funds have been included in the fiscal year 1968 budget to continue development.

Ballistic missile warning

The numbers of ballistic missile early warning systems (BMEWS) and over-the-horizon (OTH) radar sites are the same as shown last year.

We are also continuing work on "back scatter" over-the-horizon radars.

An interim capability to detect sea launched ballistic missiles (SLBM's) is being phased in during fiscal year 1968. The SLBM detection system will include modified SAGE and SPACE-TRACK radars.

Antisatellite defense

As described in previous years, we have a capability to intercept and destroy hostile satellites within certain ranges. This capability will be maintained through fiscal year 1968.

CIVIL DEFENSE

The civil defense program proposed for fiscal year 1968 is essentially the same in content and objectives as that approved for the current year. The funds requested would carry forward the civil defense program at about the same level as the current fiscal year. A financial summary of the program, estimated to cost \$111 million in fiscal year 1968, appears in figure 5.

FIGURE 5

Financial summary of civil defense[TOA ¹ dollars in millions]

	Fiscal year—						
	1962	1963	1964	1965	1966	1967	1968
Shelter survey.....	58.4	9.3	7.1	10.6	17.7	18.4	18.0
Shelter improvement.....				1.4	2.5		
Shelter development.....	.3	1.4	1.7	3.6	5.1	5.0	³ 3.7
Marking and stocking.....	90.3	32.7	24.2	2.3	1.1	1.5	4.8
Shelter use.....				4.5	2.7	2.3	3.8
Warning.....	6.8	4.1	1.8	2.7	.6	.8	.9
Command, control, and communications.....	⁴ 22.9	3.1	6.5	8.4	11.6	3.9	2.8
Emergency operations support.....	16.8	10.1	6.7	6.0	6.6	6.5	9.7
Financial assistance.....	18.9	27.5	23.7	25.6	23.9	27.0	30.0
Information activities.....	3.9	3.4	2.0	1.4	1.7	2.3	2.5
Management.....	12.4	13.6	13.9	14.3	12.0	12.6	13.2
Research and development.....	19.0	11.0	10.0	10.0	10.0	10.0	10.0
Training and education.....	2.6	9.2	12.9	10.7	11.6	11.7	11.6
Total ⁵	252.3	125.4	110.5	101.5	105.1	102.1	111.0
Shelter spaces ⁶ (millions, cumulative):							
Identified.....		103.7	121.4	135.6	152.1	162.0	170.0
Marked ⁷		42.8	63.8	75.9	85.3	97.0	112.0
Stocked ⁷		9.7	23.8	33.8	41.3	49.0	56.0

¹ Total obligational authority.² Includes packaged ventilation kits.³ Includes architect and engineer advisory services on design techniques.⁴ Includes \$2,300,000 carryover from OCDM for construction of a regional center; \$13,400,000 returned to Treasury—not used by GSA in Federal building construction.⁵ Totals may not add due to rounding.⁶ Shelter spaces resulting from the currently approved program: fiscal years 1963 to 1966 are actual, fiscal years 1967 and 1968 are estimated.⁷ Only public shelters having 50 or more spaces are eligible for marking and stocking.

FINANCIAL SUMMARY

The strategic forces programs I have outlined will require total obligational authority of \$8.1 billion in fiscal year 1968. A comparison with prior years is shown below:

	1962 actual	1963 actual	1964 actual	1965 actual	1966 actual	1967 estimate	1968 proposed
Strategic forces.....	11.2	10.5	9.3	7.1	6.8	7.1	8.1

GENERAL PURPOSE FORCES

The General Purpose Forces include most of the Army's combat and combat support units, virtually all Navy units (except for the Polaris forces), all Marine Corps units, and the tactical units of the Air Force. These are the forces upon which we rely for all military actions short of general nuclear war, i.e., limited war and counter-insurgency operations.

REQUIREMENTS FOR GENERAL PURPOSE FORCES

Over the last few years I have presented to the committee in considerable detail or analysis of the limited war problem and our requirements for General Purpose Forces. I have pointed out that our strategic nuclear capability is designed to deter attack at but one end

of the spectrum of aggression and that we must, therefore, have other forms of military power, both to deter lesser aggressions and to defeat them if deterrence fails. We need these other forms of military power, not so much for the defense of our own territory as for the support of our commitments to other nations under the various collective defense arrangements we have entered into since the end of World War II. These include the Rio Pact in the Western Hemisphere, NATO in Europe, SEATO and ANZUS in the Far East, and the bilateral mutual defense agreements with Korea, Japan, the Republic of China, and the Philippines.

All of these mutual defense treaty commitments, involving a total of some 40-odd sovereign nations, stem from the great policy decision, made at the end of the Second World War, to base our security on the collective defense of the free world.

In fact even without these treaty obligations, I suspect that our country's action would not have differed significantly in the more than two decades which have elapsed since the end of World War II. We must remember that we twice came to the assistance of our friends in Western Europe without any prior treaty commitments; we did so because we deemed it vital to our own security. We came to the assistance of South Korea—and we are now assisting South Vietnam—for the same reason. So it is not the treaties themselves that cause our greater involvement in the affairs of the rest of the world, but rather what we deem to be our own vital national security interests over the longer run.

While the distinction between General Nuclear War Forces and Limited War Forces is somewhat arbitrary in that all of our forces would be employed in a general war, and certain elements of our strategic forces in a limited war (e.g., the B-52's against the Vietcong forces in Vietnam), it is primarily the limited war mission which shapes the size and character of the General Purpose Forces. Because we cannot predict in detail the actual contingencies we may have to face, we must build into our forces a capability to deal with a very wide range of situations. This accounts for the great diversification in the kinds of units, capabilities, weapons, equipment, supplies, and training which must be provided and seriously complicates the task of determining specific requirements.

Nevertheless, our continuing study of these requirements has reaffirmed my conclusion that the General Purpose Forces which I presented here a year ago are about the right order of magnitude. This conclusion takes into account the contributions to collective defense which our allies can be expected to make, as well as our own going capability to concentrate our military power rapidly in a distant threatened area.

Although our General Purpose Forces are primarily designed for nonnuclear warfare, we do not preclude the use of nuclear weapons even in limited wars. However, as I have pointed out in previous years, the employment of such weapons in a limited war would not necessarily be to our advantage in every case, and it would present some extremely difficult and complex problems.

A careful review of our General Purpose Force requirements, including the temporary augmentations for southeast Asia, indicates a need in fiscal year 1968 for a total land force of about 31½ division force equivalents. By "division force" I mean the division itself, plus all

of its support forces. The Army will have active division equivalents; and Marine Corps, four.

With regard to tactical air power we now have a total of about 4 — fighter, attack, and reconnaissance aircraft which constitute the equipment of the combat squadrons of both the Active and Reserve Forces of the Air Force, Navy, and Marine Corps.

The nonaviation naval forces are more difficult to summarize in this manner and I will discuss them in detail later in the context with — Navy General Purpose Forces.

As I have pointed out on numerous occasions in the past, it is not enough that our forces be of the right ——— and composition; they must also be provided with the weapons, equipment, ammunition, and supplies needed to sustain them in combat. And, since most combat operations will usually involve all the services the logistics objectives which inscribe in broad terms the equipping and stockage standards to be followed, must be as uniform as possible throughout the Department. The objectives, together with the force to be supported and our contingency deployment plans, determine the content (and costs) of the annual procurement programs.

Of course, the specific procurement programs to achieve these logistic objectives must realistically take account of the state of the production base, especially for ammunition. The purpose of our war reserve inventories is to provide our forces with sufficient supplies to conduct sustained combat until production can be raised sufficiently to offset combat consumption. In peacetime, therefore, when production rates are tailored to low levels of consumption and attrition, it is important to have large stocks on hand, equal or nearly equal to the calculated war reserve objectives. However, once our forces have been committed to combat and production has been built up to offset current consumption, as is now the case in the current conflict, it is not necessary (indeed, it would be imprudent) to rebuild those stocks to their precombat inventory level before the conflict ends. It is not necessary because our present expanded production base will be able to provide for all expected southeast Asia consumption as well as any other contingency or contingencies which might arise. It would be imprudent because we know from experience that when the conflict ends, we either would have to shut down the lines abruptly, with all of the resultant adverse consequences for our economy, or we would have to acquire unwanted surpluses.

Accordingly, we have planned our fiscal year 1967-68 procurement program in such a way that if the war should end suddenly, we can taper off production gradually, using the excess production capacity to rebuild our inventories to the desired procombat levels. At the present production rates this could be achieved very quickly. For items which are not currently in expanded production for southeast Asian operations, or for new items just entering the inventory, we will, of course, continue to procure toward our logistics objectives with the goal of achieving them, wherever feasible and desirable, with the fiscal year 1968 buy.

CAPABILITIES OF THE PROGRAMED FORCES

As I noted earlier, our General Purpose Forces requirements are derived from analyses of contingencies, including the support of our allies around the world. Accordingly, our General Purpose Forces

capabilities must be assessed in conjunction with the capabilities of these allied forces. Although we have considerable knowledge of the force plans of our allies, we cannot be sure how they will change with the passage of time. This creates some uncertainty about the specific requirements for U.S. forces in the more distant years of the 5-year programming period, for which we must make allowances in our force planning.

ARMY GENERAL PURPOSE FORCES

The Department of Defense for many years, and under several administrations, has been striving to make the "One Army" concept a reality as well as a slogan. You may recall that when I appeared before the congressional committee in May 1961 in support of President Kennedy's recommendations on the realignment of the Army Reserve components, I noted that "they must be so organized, trained, and equipped as to permit their rapid integration into the Active Army." Since that time we have not only been working on the question of how the Reserve components should be organized but also on how the Reserve and Active Army structures could best be meshed together. This latter question requires not only a comprehensive analysis of the total Army force requirement but also a very careful and detailed analysis of which elements of the total structure should be provided in the Active Forces and which in the Reserve Forces.

Fundamental to this type of analysis is the concept of a "division force." Although the combat division has long been the most widely used standard for measuring the strength of the land forces, it accounts for only about one-third of the combat and support units required to sustain the division in combat over an extended period of time. A "ready" division without "ready" support elements would be incapable of combat. The division force concept ensures that our planning explicitly recognizes this relationship (indeed, interdependence) between the division and its major support elements, since it requires us to identify these elements in detail.

As a first approach to the problem, we have grouped all of the organized (T.O. & E.) units of the division force into three categories:

The division itself.

The initial support increment (ISI), i.e., the nondivisional combat and combat support units which are required to support the division in the initial combat phase.

The sustaining support increment (SSI), i.e., the additional nondivisional units including the combat, combat support, and service support needed by the division for sustained combat operations beyond the initial phase.

By structuring the division force in this way, we can see more clearly the relationship of the divisions themselves to the other Army units shown on the classified table provided to the committee.

In addition, the division force concept helps us to:

Relate standards of unit readiness, manning levels, etc., directly to the time phased unit deployment schedules, which underlie our contingency planning.

Determine more precisely which units must be provided in the actual forces and which could be provided in the Reserve components.

Tailor forces for particular missions, operational environments, and tempos of activity.

Understand better the relationship between support functions (supply, maintenance, transportation, etc.) and combat functions (maneuver and firepower), thereby enabling us to achieve a better allocation of resources among them.

Calculate more precisely the personnel and materiel requirements of each unit.

While the concept still needs considerable development before all of the foregoing advantages can be fully realized, it has already proved of significant value in our force planning.

Army force structure

The integrated Active-Reserve Army force structure proposed for the fiscal year 1968-72 period is grouped under three main headings—division and brigade forces, major supporting forces, and combat and support battalions.

Division and brigade forces. Because of the temporary Vietnam augmentations to the Active Army, the force structure we are proposing at the end of fiscal year 1968 is the equivalent of 27½ division forces in the active and Reserve structure combined (18½ Active and nine Reserve components).

You may recall that funds were included in the fiscal year 1967 budget to initiate procurement of long leadtime items for the conversion of a second division to the airmobile configuration, if experience proved this desirable. The existing airmobile division, the 1st Cavalry, proved its worth in Vietnam and I have, therefore, tentatively approved the conversion of an airborne division to an airmobile configuration. The actual timing of this action is subject to the preparation of a detailed conversion plan by the Army and the JCS, but for planning purposes we have scheduled it for early fiscal year 1969.

Major supporting forces. This grouping covers the major supporting forces, most of which represent the initial or sustaining support for the division and brigade forces. In fiscal year 1969 (when an airborne division is converted to airmobile), the Army will keep a portion of the airborne assets to form a new permanent airborne brigade, thereby establishing the brigade total at seven.

Combat and support battalions. We now propose to make a small increase in the number of maneuver battalions.

With respect to artillery battalions, the demands of the conflict in southeast Asia together with our continuing study of the peacetime force requirements have caused us to make a number of changes in the structure. First, we now plan to increase the number of artillery battalions in the active forces. Second, our experience in Vietnam has shown that the mix of separate artillery battalions could contain more heavy 8-inch howitzers and 175-mm. gun battalions. Accordingly, a significant portion of the increase in artillery battalions will be of these types.

The number of engineer combat battalions in the active forces has been temporarily increased in order to meet southeast Asia needs.

The buildup of aviation units in the Army will continue through fiscal year 1968.

We now plan to initiate in fiscal year 1968 a new development program designed to ensure that the Nike-Hercules can continue to

operate effectively in the 1970's. This new program together with the Hawk improvement program will provide a hedge against possible slippage in the development of the SAM-D which is tentatively planned as a replacement for both Hercules and Hawk.

Last year we had tentatively planned to start procurement of the Improved Hawk in fiscal year 1968. However, the project has encountered some development problems and the program has slipped. Meanwhile we will go ahead with production preparations using the funds provided in fiscal year 1967 and those requested in fiscal year 1968 for production engineering and production prototype missiles. Three types of operational gun/Chaparral battalions are being formed: a fully self-propelled battalion for the armored and mechanized divisions; a modified self-propelled version (including one towed gun battery which can be airlifted) for the infantry division; and an all-towed version for the airmobile and airborne division.

Army procurement

The revised fiscal year 1967 Army procurement program now totals \$5,863 million, of which \$2,130 million is included in the supplemental. The 1968 program totals \$5,881 million.

The fiscal year 1967 program now totals \$1,202 million for 2,697 aircraft, of which \$533 million is included in the supplemental request. The fiscal year 1968 program includes \$769 million for 1,479 aircraft. The aircraft to be procured include the UH-1B/D (Iroquois) tactical utility transport helicopter, the AH-1G (Cobra) armed helicopter, the CH-47 (Chinook) transport helicopter, the OH-6A observation helicopter, the CH-54A heavy lift helicopter, the U-21A administrative support aircraft, the OV-1C (Mohawk) fixed-wing observation aircraft, as well as a large number of training helicopters.

Funds are also requested for the procurement of long leadtime components for the AH-56A advanced aerial fire support system (AAFSS) to permit early initiation of production, when development warrants such a decision.

Army missile procurement (including spares) will total \$561 million in fiscal year 1967 and \$769 million in fiscal year 1968. The fiscal year 1968 program provides for ground support equipment for the Quick Reaction Alert Pershing battalions deployed in Europe; Lance missiles and related ground support equipment; initial procurement of the TOW missile system; a large quantity of Shillelagh missiles; Redeye and Chaparral air defense missiles; and ground support and training equipment for the Hawk missile system.

The revised fiscal year 1967 program for weapons and combat vehicles totals \$589 million (\$83 million in the supplemental request), and \$554 million is included in the fiscal year 1968 budget request. These funds will provide for completion of the planned procurement of the M-139 (HS-820) 20 mm. gun; substantial quantities of the 20 mm. Vulcan air defense gun and the 5.56 mm. rifle; and additional 81 mm. mortars and self-propelled 155 mm. howitzers. The funds requested will also provide for procurement of the M-578 light recovery vehicle, the General Sheridan armored reconnaissance and airborne assault vehicle, the M-113 armed personnel carrier, the 81 mm. and 107 mm. self-propelled mortars, the M-577 command post carrier and the M-54 cargo carrier. We have also included funds for M-60's with the 105 mm. gun, M-60's with the Shillelagh 152 mm.

gun, the armored vehicle bridge, and the combat engine vehicle, all of which use the M-54 chassis.

In fiscal year 1968, advance production engineering for the main battle tank will require \$11 million. Additional funds will be required for the U.S. share of the development costs.

The revised fiscal year 1967 program for trucks and other non-combat vehicles total \$653 million (\$154 in the supplemental request). For fiscal year 1968 \$483 million is requested for a variety of these vehicles. Included in the fiscal year 1968 program are ¼-ton, 1¼-ton (M715), 2½-ton and 5-ton trucks of all types.

For communications and electronic procurement, the revised fiscal year 1967 program provides \$617 million (\$30 million in the supplemental request and the fiscal year 1968 request totals \$55 million.

For ammunition the Army's revised fiscal year 1967 program includes \$1,36* million (\$584 million in the supplemental request). For fiscal year 1968, \$2,2** million is requested. Ammunition procurement will continue to increase in fiscal year 1968 in order to meet the projected needs of southeast Asia. Among the major items are: small arms ammunition (5.56 mm., 7.62 mm., and 30 caliber); 40 mm. ammunition; 81 mm., 105 mm., 106 mm., 152 mm., 155 mm., and 4.2-inch cartridges; and 2.75-inch rockets.

The revised fiscal year 1967 program for other support equipment (road graders, tractors, etc.) totals \$608 million (\$247 million in the supplemental request) and \$437 million is requested for fiscal year 1968. The revised fiscal year 1967 program for production base support totals \$272 million, (\$220 million in the supplemental request and \$95 million is requested for fiscal year 1968.

NAVY GENERAL PURPOSE FORCES

The Navy General Purpose Forces proposed for the fiscal year 1968-72 period are shown on the classified table provided to the committee. Except for the Vietnamese-related forces, the major changes from the program planned last year concern the antisubmarine warfare forces, the guided missile ships, the amphibious ships and the minesweepers. There is, however, one general problem in this area which deserves special mention, and that is the dolorous state of the American shipbuilding industry.

It has become increasingly apparent in recent years that our shipbuilding industry, both public and private, has fallen far behind its competitors in other countries. Not only does it cost twice as much to build a ship in this country, it also takes twice as long.

This is a startling development in view of the fact that the United States is the most highly industrialized nation in the world. It is even more startling when we realize that the modernization of the European and Japanese yards has been achieved by applying, on a massive scale, U.S. automobile and aircraft manufacturing technology to shipbuilding.

Unfortunately, public discussion of the shipbuilding problem in this country has been focused on what is actually the minor part—its relationship to the Merchant Marine problem. I can well understand why the American flag line operators should wish to sever the present interlocking relationship between the Merchant Marine and the

shipbuilding industry; they could buy ships abroad at half the price and get delivery in about half the time. But while this divorce might solve the problem of the Merchant Marine, it would not solve the problem of the Defense Department. The U.S. Merchant Marine provides only a few hundred million dollars of work per year to the shipbuilding industry; Navy work amounts to between \$2 and \$2.5 billion a year. Thus the Defense Department, and the taxpayer, has a stake in the American shipbuilding industry which goes far beyond the immediate problems concerning the Merchant Marine.

Obviously, the more fundamental solution is to revitalize the American shipbuilding industry. Although we may never be able to overcome completely the wage rate differential, there is no reason why the American shipbuilding industry should not be, in a technological sense, as good as the best any other country has to offer. We have the technology and the manufacturing "know-how," what we need to do is to find some way in which they can be applied to the American shipbuilding industry and some way to finance the relatively large investments that would be required.

With regard to Navy work, the Defense Department has already embarked on such a program. Wherever feasible, we are grouping our annual shipbuilding program into multiyear procurement.

Of perhaps greater significance over the longer run is the new procurement package approach, of which the fast deployment logistics (FDL) ship is an outstanding example. Under this approach, the shipbuilder is asked to bid on the entire package—design, development, and construction—of a relatively large number of ships to be delivered over a period of years, much like the package approach to aircraft procurement. Several new programs of this type are contemplated, and I will discuss these in context with our proposals for the Navy General Purpose Forces in the fiscal year 1968-72 period.

Attack carrier forces

Last year, I described to the committee a new plan under which we would maintain an active fleet of 15 attack carriers and 12 air wing equivalents, instead of the 13 carriers and 13 air wings we were planning on before. We made this change because of new force structure promises to provide significantly more usable combat power than the one previously planned—and, at no increase in cost. However, a force of 15 carriers and 12 air wing equivalents would require some change in the present mode of operation. Carriers would normally deploy in peacetime with less than the maximum complement of aircraft and additional aircraft would be flown to the carriers when and as needed. In effect, we would be treating the attack carrier as a forward floating airbase, deploying the aircraft as the situation requires, much as we do in the present carrier operations off Vietnam. It is this kind of operational flexibility that enables the attack carriers to make a unique contribution to our overall tactical air capabilities.

Although the adjustment of the air wings to the new force structure is scheduled to begin in fiscal year 1968 and be completed by fiscal year 1971, the total number of combat aircraft assigned to the attack carrier force will remain virtually unchanged. You may recall that 2 years ago, in a decision unrelated to the number of carrier wings, we decided to increase the number of light attack aircraft per squadron, and the number of light attack squadrons per *Forrestal*-class carrier.

In terms of aircraft assigned, these increases, together with the replacement of *Essex*-class carriers with the much larger *Forrestal*'s and *Enterprise*'s will just about offset the reduction to 12 equivalent air wings. In other words, each equivalent air wing will have about 25 percent more aircraft than the present average air wing.

Ships. The attack carrier force at the end of the current fiscal year will consist of one nuclear-powered carrier, the *Enterprise*, and seven *Forrestal*, two *Midway*, and five *Essex* class. In fiscal year 1969, the last of the conventionally powered attack carriers now under construction, the *John F. Kennedy*, will join the fleet, followed in fiscal year 1972 by the second of the nuclear-powered carriers.

As I stated last year, if we are to retain a force of 15 carriers, two more will have to be provided. One is scheduled for fiscal year 1969 and one in a later year; both will be nuclear powered. Fifty million dollars is included in the fiscal year 1968 budget for long leadtime components for the fiscal year 1969 carrier. When these ships are delivered to the fleet the remaining *Essex*-class carriers will be retired from the CVA force, which would then consist of four nuclear powered, eight *Forrestal*- and three *Midway*-class carriers, for a total of 15.

Carrier aircraft. No major change is contemplated in the composition of the aircraft complement of the attack carrier forces from that projected a year ago. The decline in the number of fighter aircraft after fiscal year 1967 reflects two factors—the previously mentioned reduction from 15 to 12 air wing equivalents beginning in fiscal year 1968 and the substitution of the more capable F-111B for other fighter aircraft on a less than one for one basis.

In contrast to the fighters the number of attack aircraft will have increased substantially by the time the transition to the 12 equivalent air wings is complete. At that point, the attack aircraft force will consist of A-6's and the new A-7's.

Inasmuch as the A-3 heavy aircraft are no longer required for the strategic mission, they are now being used as tankers to extend the range of "shorter legged" Navy aircraft.

No significant changes have been made in the combat readiness training aircraft forces.

ASW and destroyer forces

Three years ago in recognition of the unsatisfactory state of our knowledge in antisubmarine warfare I requested the Navy to undertake systematic long-term studies of all of the related aspects of the problem. From these studies has come a much better understanding of both the character and extent of the threat and the capabilities of the forces required to cope with it. As a result it now appears that some additional changes should be made in our ASW program. These involve the size of our ASW carrier forces and the substitution of land-based patrol aircraft for the seaplanes.

ASW carriers. We now have eight *Essex*-class ASW carriers, one of which, the *Intrepid*, is temporarily operating as an attack carrier in support of southeast Asia operations. Our studies show that compared with other ASW forces, the CVS ASW Group is a high-cost system in relation to its effectiveness; the annual operation cost of a CVS is about \$32 million, including about \$17.5 million for the aircraft complement.

As the newer ASW systems—the SSN's, the DE's, the P-3 patrol aircraft, etc.—join the fleet in increasing numbers, the relative value of the ASW carriers will continue to decline. Accordingly, we now propose to reduce the force somewhat when the conflict in Vietnam ends.

The older SH-34 helicopters or CVS's have already been replaced by the new SH-3, and the CVA's are now also being provided some of these helicopters.

The older S-2's will have been completely replaced by the newer S-2E's by the the end of fiscal year 1967. While full scale development and procurement of a replacement aircraft should not be undertaken until the role of the CVS in the overall ASW effort of the 1970's has been clarified and until the need for a more sophisticated capability has been clearly demonstrated, we have included funds for contract definition of a new aircraft (VSX) should further study warrant our going ahead with this program.

In addition to its ASW aircraft each CVS is authorized a few A-4—in order to provide a limited intercept and air defense capability. Finally we will continue to maintain eight squadrons of carrier-based ASW search aircraft and four squadrons of ASW helicopters in the Naval Reserve Forces for the four CVS's we plan to retain in the Reserve fleet.

Attack submarine forces. By the end of the current fiscal year the submarine force, excluding Polaris will number 105 submarines, 32 of which will be nuclear powered. We have continued to encounter difficulty in getting the SSN program on schedule, principally because of the submarine safety program and a shortage of skilled workers. As a result we will have a few less SSN's in the force at end fiscal year 1967 than planned last year but we hope to make up most of this shortage next year. In the meantime, we propose to offset this slippage by delaying the phaseout of an equivalent number of conventionally powered submarines.

As I pointed out last year, a force of about 64 "first class" SSN's would be needed. Five SSN's were provided by the Congress in fiscal year 1967, leaving a total of six SSN's still to be funded. We now propose to start three more SSN's in fiscal year 1968 and three in fiscal year 1969. This program will give us a total of 64 first class SSN's, plus four other SSN's which could be used together with the conventionally powered submarines for other ASW missions. If our continuing study of the ASW problem should indicate that additional SSN's are required, we can add to this program next year.

Originally, we had intended to modernize 12 conventionally powered submarines (Korean war vintage of later), including provision of improved sonar. Last year, when it became apparent that these sonars were not going to be available in time, we decided to go ahead with the modernization of the first five submarines without the sonar improvements. It now appears that the new sonar components will still not be available for installation in the remaining seven submarines in fiscal year 1968. Moreover, other modernization costs have risen to the point where we now believe that it is no longer practical to proceed with the program. Accordingly, the plan to modernize these seven submarines in fiscal year 1968 has been dropped.

In the submarine direct support category, we propose a phased replacement program for our present submarine rescue ships (ASR's).

Therefore we tentatively propose to construct five new ASR's over the next few years. These new ASR's will have catamaran (i.e., twin) hulls and provide much greater deck space, including a helicopter platform, and better sea-keeping qualities than the present ships. They will be capable of operating two rescue submersibles and supporting divers at greater depths for prolonged periods. We are requesting \$17.7 million for the ASR in fiscal year 1968.

In addition to the 10 ASR's, which we plan to maintain throughout the period, the submarine direct support force includes six submarine tenders (AS) and nine auxiliary submarines (AGSS). Two new submarine tenders are tentatively scheduled to be constructed in future years.

ASW escorts. The requirement for ASW escorts can be met by several different types of ships most of which are also capable of performing other missions such as patrol, fire support and anti-air warfare. In planning for our future ASW escort forces, all ships with an ASW capability are taken into account. However, only the destroyer types without a SAM capability are included under the ASW category; the SAM ships will be discussed later.

Two years ago we proposed a phased replacement program for the destroyer escort force. In accord with that plan, \$298 million has been included in the fiscal year 1968 request for 10 more of these ships.

With respect to the years beyond fiscal year 1968, it now appears that substantial construction and operating economies could be achieved with a newly designed ship (tentatively designated the DX) employing the "total package" procurement concept and a large multiyear buy. It may also be possible to use the same approach and the same or a similar design for a new class of guided missile ships (tentatively designated the DXG.) Accordingly, we propose to initiate a new program which would provide for:

- Standardized design and serial production of a sizable quantity of identical ships in order to minimize total procurement cost.

- Incentive to the contractor to design a highly automated ship requiring minimum manning in order to reduce operating costs.

- Standardization in order to reduce logistic support costs.

- Possible standardization/integration of the DX and DXG in order to maximize further advantages of standardization and serial construction (e.g., both ships might have the same hull and differ only in their weapon systems, or perhaps their hulls could have common bow and stern sections with separate mid-sections for each type).

- Possible use of modular design concepts so that major components (e.g., specific weapon systems) could be installed and removed *en bloc*, facilitating both repair and future modernization.

We have included \$30 million in the fiscal year 1968 budget to initiate concept formulation and contract definition of the DX/DXG. At the conclusion of the contract definition phase the entire program will be reevaluated in the light of the detailed designs and cost estimates which result.

We are also continuing to improve the SQS-23 sonars on most of the earlier DE's and on a large number of DD's, guided missile destroyers (DDG's), and cruisers (CG/CGN's). About \$18 million was programmed for this purpose in fiscal year 1966, about \$11 million

in fiscal year 1967, and we are requesting another \$24 million in fiscal year 1968.

As I described a year ago, we are taking steps to improve the ASW capabilities of 13 remaining D-931 class destroyers, all of which are less than 12 years old. We are providing them with ASROC, improved communications, a new variable depth sonar (VDS), improved ECM capabilities, the improvement to the SQS-23 sonar, a modern ASW combat information center, etc.—at a cost of about \$14 million each. Since the VDS equipment will not be available this year, the ships are being rewired now to accept it later when it does become available. With these improvements, the 13 remaining DD's should offer comparable, and in some ways even better, ASW performance than the new DE's we are building.

Originally, having funded one in fiscal year 1964, we planned on five of these DD-931 conversions in fiscal year 1966 and five this year, with the last three scheduled for fiscal year 1968. However, because of equipment procurement problems, we have rescheduled the program. We have one in conversion now and plan to start three conversions this year, seven more in fiscal year 1968, and the last three in fiscal year 1969.

Patrol aircraft. While we still plan to maintain a total of 30 squadrons of ASW patrol aircraft, we now propose to phase out the three remaining squadrons of seaplanes (SP-5) and retain, instead, three squadrons of SP-2 land-based patrol aircraft. One squadron will be converted this year and the other two in fiscal year 1968. This change will permit us to decommission the three remaining seaplane support ships (AV's) and thereby save \$17 million per year in operating and indirect costs, with no reduction in our overall ASW or surveillance capability. Except for these three squadrons, all the SP-2's will be phased out of the active ASW patrol forces over the next few years and replaced with 27 squadrons of the new P-3's. (Ten squadrons of SF-2's will be retained in the Navy Reserve.)

Beginning in fiscal year 1968, all new P-3's will be procured with the A-NEW avionics system and when the force buildup is completed we will have nine squadrons so equipped.

Multipurpose SAM ships. The multipurpose surface-to-air missile (SAM) ships provide an important part of the fleet's antiair warfare (AAW) capability. As I described last year, our current program objective for the SAM force is 79 ships. By the end of fiscal year 1967 the SAM ship force will consist of 70 ships, three of them nuclear powered.

Last year Congress added funds to our original budget request for construction of a nuclear-powered frigate. As you know, we did not recommend the inclusion of such a ship in our fiscal year 1967 program. However, we have decided to proceed with construction this year.

I am also again recommending the construction of two guided-missile destroyers (DDG's).

The new DDG's and DLGN would have significantly improved AAW and ASW capabilities compared with present SAM ships, particularly in a hostile ECM environment. They will employ the new Standard missile and be equipped with the latest ASW equipment, the Navy tactical data system, and the improved SQS-26 sonar. Provisions would, of course, be made to incorporate new systems and

technologies as they become available, and space will be provided for this. Some \$167 million is requested for the two DDG's in fiscal year 1968.

In addition, we are continuing the SAM improvement program, under which the Standard missile is now being procured to replace both Tartar and Terrier.

Last year I mentioned that we were studying the feasibility of providing a "close-in" or "point" air defense capability for other types of combat ships. We now propose to procure and install a basic point defense surface missile system (PDSMS) on ships which are not likely to encounter the more sophisticated forms of air attack and which do not generally operate in the company of regular SAM ships—e.g., amphibious assault ships and destroyer types operating independently near hostile land areas. This system makes use of existing hardware (e.g., Sparrow III missiles) and can be installed on existing gun mount foundations.

About \$14 million has been included in fiscal year 1968 budget for the first procurement.

Other combatant ships

At end fiscal year 1967, there will be 23 ships in the small patrol category. These ships are used for coastal surveillance and patrol boats (PTF's) costing \$17 million have been added to the fiscal year 1967 program.

The primary mission of fire support ships, also included in this category, is to provide a heavy concentration of ship-to-shore fire during amphibious assaults. The Navy is presently studying the feasibility of a new type of landing force support ship which would combine the fire support capabilities of the cruiser's heavy guns and the rocket ship's saturation fire.

Amphibious assault ships

Last year I informed the committee that while our objectives of achieving a modernized (20-knot) amphibious lift for one and a half Marine Expeditionary Forces (MEF, of division/wing teams) and sufficient older ships to provide a slower lift for another half of a MEF remained the same, further study of the competition of the force had convinced us that some modification of the future construction program was desirable. I also noted that the Navy was investigating the possibility of designing a multipurpose ship which could combine the features of several different types of amphibious ships and that one of the reasons we had rescheduled the program was to provide time to develop a design for this new ship.

Unfortunately, experience has shown that our current LPD's are too small to be truly effective as a multipurpose amphibious ship in the assault role and they cannot by themselves serve as a replacement for a variety of specialized ships. For this purpose we need a bigger assault ship capable of landing, either by air or by sea, a much larger and more balanced land force than is now possible with any existing amphibious vessel, and this was the type of ship I mentioned last year.

Our further study of this problem indicates that the development of such a ship is not only feasible but highly desirable. On the basis of the Navy's preliminary design work, this amphibious assault ship,

now designated the LHA, would be quite large (about 40,000 tons, compared with less than 18,000 tons for the LPD) and would have both a boat well and a helicopter deck.

In view of these advantages, we now propose to substitute LHA's for a variety of specialized amphibious ships which we had previously programed. The first of these LHA's has been included in the fiscal year 1967 program. As in the case of the C-5— and the fast deployment logistic ships, we plan to use the two-step contract definition, total package procurement technique for the LHA's and \$18 million is included in the fiscal year 1968 budget for contract definition in addition to funds for the construction of the first ship.

One of the goals we hope to achieve in this program is a considerable reduction in operating costs. To this end the competing contractors will be encouraged to design this ship so that it can be operated by significantly fewer personnel than previous ships of this size.

Mine countermeasure force

At the end of this fiscal year we will have a mine countermeasure force of 88 ships, composed of 64 ocean minesweepers (MSO's), 18 coastal minesweepers (MSC's), three mine countermeasures support ships (MCS's), and three other support ships.

In order to modernize this force and improve its mine countermeasure capabilities, we propose to undertake a major rehabilitation program for all the existing MSO's. We propose to start the rehabilitation of nine MSO's in fiscal year 1968, for which we are requesting \$33 million.

Two years ago, we started a construction program for new MSO's. Four MSO's were funded in fiscal year 1966, five more in fiscal year 1967, and we are requesting \$61 million in fiscal year 1968 for the last seven.

Last year we initiated a program to provide some of the Marine Corps assault helicopters (CH-53's) with a secondary mine-sweeping capability. Modification of some of these helicopters to accept the sweep equipment was begun last year, and we plan to start more in fiscal year 1968. This program will give our assault forces a significantly augmented minesweeping capability against less sophisticated mines at a total cost of only about \$12 million.

Logistical, operational support, and direct support ships

In order to take advantage of modern resupply methods and to complement the higher speeds of our latest ships, we have planned a long range construction program to rebuild the underway replenishment fleet. The fiscal year 1968 program includes two AE's (ammunition ships) and one AOE (fast combat support ship) at an estimated cost of \$137 million.

Marine Corps forces

The major Marine Corps ground and air units shown on the classified table provided to the committee are essentially the same as those we projected last year. The temporary units added to support the southeast Asia deployments include a fourth active division with its associated nine infantry, one tank, one amphibian tractor, and the equivalent of five artillery battalions, four Hawk air defense batteries, and two light observation and two medium transport helicopter

squadrons. The permanent force remains at four divisions/aircraft wings (three active and one reserve).

The Marine Corps fighter forces will be maintained at about the current level.

The tactical air control (TAC) force, which is used to locate enemy targets and then direct the attack aircraft to them, is programed to remain at the present level.

In the transport helicopter category, we now plan to maintain the currently augmented active force level through fiscal year 1969, while simultaneously building our Reserve structure. When the Vietnam conflict ends the Marine Corps transport helicopter force will return to the planned permanent level.

In the light helicopter and observation category the total number of aircraft will be increased significantly in fiscal year 1968 through the temporary retention of O-1's and UH-1's previously scheduled to phase out after the new OV-10's are delivered.

Last year we undertook a major program to increase the fixed-wing combat readiness training capabilities of the Marine Corps. This program will be continued. We also undertook at that time, on a temporary basis, a program of combat readiness training for Marine Corps helicopter pilots. We now plan to make the combat crew readiness training program permanent and to expand the force level. Later, as the OV-10 enters the operating force, we plan to add some of these aircraft to the combat readiness training force.

The numbers of tanker/transport aircraft and of support aircraft are essentially unchanged from those presented last year.

Navy and Marine Corps Reserve forces

The Navy will continue to maintain a total of about 50 ships in the Naval Reserve. As more modern ships become available from the active forces, older ships will be phased out.

The Navy also maintains a large number of ships in the Reserve (or "mothball") Fleet, in either category B (Bravo) or category C (Charlie) according to their physical condition and readiness status.

As I noted last year, because of their relatively poor physical condition many of the Charlie ships would be usable only after extensive overhauling and modernization. Accordingly the Navy is continuously surveying these ships in order to identify those which have no further value. These ships are then scrapped or otherwise disposed of. As a result, the size of the Reserve Fleet has been progressively reduced.

The Naval and Marine Corps Reserve air units are programed for about 740 aircraft at the end of this fiscal year, and this number will be increased over the next few years.

Navy-Marine Corps aircraft procurement

The Navy and Marine Corps aircraft procurement program is shown on the classified table provided to the committee. In order to meet the requirements of the southeast Asia conflict and continue the planned modernization of the force, we propose to increase the fiscal year 1967 program from the original 620 aircraft to 1,047, and to buy another 680 aircraft in fiscal year 1968 instead of the 604 planned a year ago.

With regard to the modernization of the attack carrier fighter forces, we still plan to initiate F-111B procurement in fiscal year 1968.

To provide for combat attrition beyond fiscal year 1967 and com-

plete the equipping of the Marine Corps fighter squadrons, we have increased the fiscal year 1967-68 F-4 procurement programs substantially over the number previously planned. This will permit the replacement of the last Marine Corps F-8 squadron in fiscal year 1968.

Since we plan to retain a number of F-8 aircraft in both the Active Fleet (for the *Essex*-class CVA's) and the Reserve Forces for some time beyond fiscal year 1968, we have decided to rework a substantial number of the latest models, providing them with new wings and other life-extension modifications. The program was initiated last spring, using about \$17 million of fiscal year 1966 funds; \$70 million is included in the revised fiscal year 1967 budget; another \$70 million is requested for fiscal year 1968.

In the attack category we now plan to increase substantially the fiscal year 1967-68 procurement program envisioned a year ago. We have added A-4F's and A-6A's to the fiscal year 1967 program, and A-6A's to the fiscal year 1968 program. The A-7 program for fiscal year 1967-68 is about the same as presented a year ago.

Last year we had planned on buying the first 100 OV-10 aircraft for the Marine Corps in fiscal year 1967. However, the need for certain design changes has delayed the award of the contract and has caused us to reduce the fiscal year 1967 quantity. Additional OV-10's will be procured in fiscal year 1968.

For the ASW mission, another increment of the P-3's with A-NEW will be procured in fiscal year 1968.

To provide for the higher tempo of operations and future combat attrition in Vietnam, we are increasing our procurement of helicopters in fiscal year 1967, and buying more in fiscal year 1968.

In the fleet tactical and mission support category, we have added some C-130 radio relay aircraft to the fiscal year 1967 program and canceled the previously planned C-2A procurement.

The increase in planned pilot production from 2,200 to 2,525 per year will require the procurement of additional training aircraft.

Accordingly, we have canceled the previously planned procurement of 72 T-28C's in fiscal year 1966 and 58 in fiscal year 1967, and instead we now propose to procure 36 T-2B's and 94 TA-4's in fiscal year 1967, and 90 T-37B's in fiscal year 1968. We have also included in the fiscal year 1967 program 9 TC-4C's (a version of the Grumman Gulfstream) for navigator bombardier training. This will reduce the requirement for A-6A's now being used for this purpose.

For helicopter training we will be able to utilize UH-1E's as they are released by new OV-10's phasing into the force, thus permitting the cancellation of the 20 TH-1E planned for procurement in fiscal year 1967. In addition, we plan to buy 40 new instrumented light turbine helicopters (LTH's) in fiscal year 1968 to provide the increased training capacity mentioned earlier.

Other Navy procurement

In order to build toward our logistics objectives and to provide for projected combat consumption in southeast Asia, we are requesting \$1,389 million in fiscal year 1967 (of which \$164 million is included in the supplemental request) for Navy missiles, ordnance, and ammunition; and \$1,723 million more is requested in the fiscal year 1968 budget for this purpose.

Large quantities of air-to-ground munitions will continue to be needed in fiscal year 1967-68. The largest single item in this category is the MK-82 500-pound bomb. Other important items in the fiscal year 1968 program are the 2.75-inch rockets, the 5-inch Zuni rockets, the 250-pound bomb, Walleye TV-guided glide bombs, and air-to-surface antiradiation missiles.

For the surface-to-air missile ships which provide the fleet's air defense, the Navy will procure only the new Standard missile beginning in fiscal year 1968, although deliveries of Terrier and Tartar missiles will continue for some time. We are requesting \$5 million in fiscal year 1968 for both the medium range and the extended-range Standard missiles.

Funds for the procurement of the final quantity of Talos missiles are included in the fiscal year 1968 budget.

With respect to air-to-air missiles we are buying both the Sidewinder and the Sparrow III in fiscal year 1968. We also propose to initiate pilot line production of the Phoenix missile in fiscal year 1968.

In the ASW category, we plan to continue the procurement of Asroc and Subroc in fiscal year 1968.

Last year I informed the committee that the DASH ASW drone helicopter was encountering higher than expected peacetime attrition at lower than expected performance, and that we would review the entire program. As a result of this review, we have now decided to reduce the planned deployment of this system to about one-third. This reduction in deployment will permit cancellation of the previously planned fiscal year 1967 procurement.

Improved ASW torpedoes continue to be a major prerequisite to a more effective ASW force, and this category of weapons has continued to receive our close attention. In an attempt to expand the production base for the MK-46 and obtain the cost benefits of competitive procurement, we have opened a second production source. Although we have achieved the cost benefits (the torpedoes bought in fiscal year 1966, for example, cost \$124.3 million compared with the budget estimate of \$179 million), it now seems clear that we will not achieve the production levels in fiscal year 1967 originally expected. Accordingly, the fiscal year 1968 procurement is adjusted to take this slippage into account.

Funds are also included in the fiscal year 1968 budget for the AN/SSQ-41 (Julie, Jezebel), an improved sonobuoy capable of employment in either an active (Julie) or passive (Jezebel) mode.

Finally, a total of about \$125 million is included in the fiscal year 1968 Budget for 8-inch, 6-inch, and 5-inch naval gun ammunition to meet the consumption requirements of southeast Asia and continue the buildup of our stocks.

Marine Corps procurement

The fiscal year 1967 Marine Corps procurement now totals \$541 million, of which \$253 million is included in the fiscal year 1967 supplemental. For fiscal year 1968, a total of \$715 million is requested. Included in the fiscal year 1967 total is \$231 million for munitions and ordnance (\$114 million in the supplemental); \$463 million is included for this purpose in fiscal year 1968.

The fiscal year 1967 supplemental provides about \$70 million for the procurement of support vehicles such as $\frac{1}{4}$ -, $\frac{1}{2}$ -, $2\frac{1}{2}$ -, and 5-ton

trucks, and \$39 million more is included for support vehicles in fiscal year 1968. For tracked vehicles, \$4 million is included in the fiscal year 1967 supplemental and \$5 million in the fiscal year 1968 budget.

In the communications and electronics category, which includes such major items as radars and the Marine Corps tactical data system (MTDS), we have increased our fiscal year 1967 procurement to \$107 million, \$29 million of which is included in the supplemental request. Another \$145 million is included for communications and electronic equipment in fiscal year 1968.

AIR FORCE GENERAL PURPOSE FORCES

The Air Force General Purpose Forces shown on the classified table provided to the committee are essentially the same as those presented a year ago, with the exception of certain changes related to our operation in Vietnam.

Fighter and attack

Our long-range force objective in this category is the same as last year, namely, 24 wings of F-4's, F-111's, and A-7's. In the near term, however, we now propose to make several changes in the force structure and procurement programs. For the most part, these adjustments are related to operations in southeast Asia, in particular, the changes in our budget planning assumptions and the variations from the projected combat attrition rates reflected in our force planning last year. And, in a few cases, the proposed changes are the result of adjustments in production schedules.

The B-57's that we are using in South Vietnam will decline in number through fiscal year 1968, after which they are scheduled to phase out of active service completely.

With respect to the F-100's, we had originally planned to phase down the active force to fewer aircraft by end fiscal year 1967. However, attrition has been lower than forecast and we will have more squadrons in the force at end fiscal year 1967 than we had previously planned.

Last year we had planned to hold a large number of F-102's in the force through fiscal year 1967 and then phase down considerably in fiscal year 1968. However, in order to free F-4's for deployment to Vietnam, F-102's scheduled to phase out of the continental air defense forces were transferred to the tactical forces in fiscal year 1966.

Last year we had planned to retain the two F-104 squadrons through fiscal year 1967. However, we now plan to have only one squadron at end of fiscal year 1967 and phase this squadron out by the end of fiscal year 1968.

The number of F-105's in the active force is projected to decline, and ultimately these aircraft will be phased into the Air National Guard.

The F-4's are experiencing somewhat lower attrition than forecast last January and this will help the force to build up faster than planned.

The F-111 activation schedule is the same as planned last year, except for a small slippage in a few of the later squadrons.

Last year, in order to help diversify the Air Force tactical fighter force, we proposed the procurement of the A-7, a relatively inexpensive subsonic aircraft with good range, large ordnance-carrying capa-

bility, long loiter time, and good close ground support features. Our original deployment schedule called for activation of the first squadron in fiscal year 1968 with more to be introduced later. However, this schedule was predicated on an early decision to proceed with the deployment of an afterburner for the Air Force A-7.

Two considerations caused us first to delay and then change this decision. First, it appeared desirable, if possible, to find a new engine production source rather than add to the already crowded schedule of one of our principal engine manufacturers. Second, if a different, more powerful engine could be used, the load-carrying capacity of the A-7 would not have to be penalized by several hundred pounds of dead weight which the afterburner would involve. Such an engine, the Rolls Royce's "Spey," proved to be obtainable from Allison, who will produce it in the United States under license from the British firm. The net result of this decision will be a more capable aircraft but a delayed delivery schedule for the first aircraft. However, a new, faster production schedule will still permit the achievement of the projected force by the originally planned date.

Tactical reconnaissance

The present long-range objective for the tactical reconnaissance force remains the same as a year ago.

Because of anticipated southeast Asia attrition and higher training requirements, the RF-101 force had been expected to decline by the end of the current year and then level off. In order to maintain that level, we will have to modify additional F-101's to the RF-101 configuration.

With respect to the RF-4's, the force will be built up to its full planned strength, although projected attrition in southeast Asia will cause a slight delay in the scheduled buildup.

Ultimately, we will probably want to introduce a more advanced capability into the tactical reconnaissance force. To this end we initiated in fiscal year 1966 a development project which would provide a reconnaissance version of the F-111. This development provides for the necessary equipment to be installed in the attack version of the F-111 with minimum modification to the aircraft. Through fiscal year 1967, \$25 million has been devoted to this effort and \$2 million more is included in the fiscal year 1968 requested. An additional substantial sum is included in our request for the initial procurement.

Tactical electronic warfare support

With the increasing importance of electronic warfare, underscored by our experience in southeast Asia, we have decided to establish a separate tactical electronic warfare support (TEWS) force in the Air Force General Purpose Forces. This force will be composed of EB-66's converted from the RB/EB-66 aircraft previously shown in the reconnaissance category, and EC-47's (formerly RC-47's).

In order to provide sufficient aircraft for training, maintenance and advanced attrition, we plan to convert the RB-66's now in the force and WB-66's now in storage to the EB-66 configuration; this will involve some modification of the engines and provision of new ECM gear. A substantial sum is requested in the fiscal year 1967 supplemental for these modifications. Later, as advanced electronic equip-

ment becomes available (e.g., from the Navy EA-6B program), it may be retrofitted into these aircraft.

Special air warfare forces

Since its creation in 1962, the Special Air Warfare (SAW) Forces have grown both in size and in the range of missions performed.

In order to meet the requirement of the Vietnam conflict, we have increased the size of the SAW Force. This increase includes additional O-2's, AC-47's, C-123's, C-47's, and A-37's, partially offset by the reduction of A-1's.

Other aircraft

The tactical air control system (TACS) provides the command and control capability for the tactical air commander in field operations. Currently, the Air Force is using modified O-1 aircraft transferred from the Army for the airborne forward air controller (AFAC) mission in southeast Asia. Last year, we had planned to convert this force completely to OV-10's by the end of fiscal year 1968. However, during the past year the requirement for AFAC aircraft has virtually doubled and, as a result, the authorized TACS force has been increased. In addition, the OV-10 program has slipped and we do not now expect deliveries of that aircraft to the Air Force to be made as fast as originally planned. In order to build up the force as soon as possible, we have already taken action to procure an off-the-shelf Cessna aircraft designated the O-2. With respect to the longer term, it is too early to make a final determination of the size and composition of the TACS force, a matter we now have under study.

Combat readiness training

As described a year ago, we want to increase the size of the advanced flying training base very significantly over what it has been in recent years. Predicated on the assumption that the southeast Asia conflict would end by June 30, 1967, this expansion was to have been substantially achieved by the end of fiscal year 1968. Now, however, under our revised budget planning assumption, completion of the buildup of the training base in terms of aircraft would be delayed until the following year.

Tactical missiles

As I indicated last year, the remaining Mace B missiles (one squadron) deployed in Germany will be phased out as Pershing takes over the quick reaction alert (QRA) ————. The remaining Mace B's deployed in Okinawa, however, are tentatively scheduled to remain in the active force through the program period.

Air National Guard

A number of changes have been made in the planned equipage of Air National Guard squadrons, most of them related to changes in the active structure. The Guard will retain more F-84's and F-86's longer in order to offset delays in the transfer of F-100's and F-105's from the Active Forces. The Guard will have 547 tactical fighters at the end of fiscal year 1967 and this number is scheduled to increase modestly in future years.

Aircraft procurement

The Air Force will procure a total of 732 tactical, air control, and reconnaissance aircraft for the General Purpose Forces in fiscal year

1967, at a total cost of \$1,847 million. (Of the total, 102 aircraft costing \$457 million are in the fiscal year 1967 supplemental request.) For fiscal year 1968, 874 aircraft costing \$2,076 million are requested for these forces. Both the fiscal year 1967 and fiscal year 1968 programs provide for combat attrition through the normal production lead time. Accordingly, if the Vietnam conflict should end before that date, both the active and reserve Air Force structures would be modernized faster than now projected.

Last year, we had scheduled procurement of a sizable number of F-4 aircraft for fiscal year 1967 and a final procurement in fiscal year 1968. We now propose to increase the fiscal year 1967 program and buy an even larger quantity in fiscal year 1968.

With respect to the F-111A, we now plan to buy somewhat fewer aircraft in fiscal year 1968 than we planned last year so as to be able to include certain improvements, which are now being made, in more of the aircraft. The aircraft deleted from the fiscal year 1968 program will be added to the end of the line.

The Air Force's A-7 program has, as I indicated earlier, slipped substantially from that projected a year ago. The fiscal year 1966 buy has been deleted and the fiscal year 1967 buy reduced. For fiscal year 1968 we plan to buy a large number of A-7's, and additional offsetting upward adjustments in procurement in subsequent years should permit us to achieve the planned force level by the originally scheduled date.

Last year we had tentatively scheduled procurement of 157 OV-10's for the TACS force. However, the TACS requirement has grown sharply during the past year, leading to the decision to buy the O-2 and this, coupled with a delay in projected OV-10 deliveries and an increase in the cost of that aircraft, has caused us to revise our planned procurement program. Although we still plan to purchase 157 OV-10's for the TACS mission, the fiscal year 1967 buy has been reduced and the difference added to the fiscal year 1968 program. Further procurement of the OV-10 for the Air Force will depend upon a future decision to use it to help modernize the Special Air Warfare Forces.

As previously mentioned, action has already been initiated to procure 176 O-2A aircraft in fiscal year 1967 for the TACS force and SAW Force's program to provide for combat attrition replacement.

More A-37 aircraft have been added to the fiscal year 1967 program and still more will be procured in fiscal year 1968. We also plan to buy more F-5's, principally to help modernize the Vietnamese Air Force.

Finally, to offset projected attrition of reconnaissance aircraft in southeast Asia, the fiscal year 1968 quantity of RF-4 aircraft has been increased and more will be procured later for advance peacetime attrition. And, as previously mentioned, to maintain the desired level of RF-101 squadrons, we will convert a number of F-101's to the reconnaissance configuration in fiscal year 1968.

Other Air Force procurement

The Air Force's aircraft nonnuclear ordnance program for fiscal year 1967 totals \$1,739 million, of which \$438 million is included in the supplemental request. The proposed fiscal year 1968 program totals \$1,629 million.

"Iron bombs," which are being consumed at high rates in southeast Asia, will continue to dominate the fiscal year 1967-68 procurement programs. For these 2 years, \$1,400 million will be spent on these bombs; including 250-pound, 500-pound, 750-pound, and 2,000-pound bombs; \$31 million is for napalm bombs and \$463 million is for 2.75-inch rockets and 20 mm. ammunition. For certain special purpose ordnance, \$888 million is requested.

Also included in the Air Force's fiscal year 1967-68 program is \$241 million for TV-guided Walleye's, antiradiation missiles, and Sparrow air-to-air missiles.

Theater airbase vulnerability

The theater airbase vulnerability program is designed to minimize the damage an enemy could do to our overseas airfields, and the aircraft on them, in a nonnuclear attack.

This year's request for \$26 million will provide various vulnerability reductions measures (shelters, paving for dispersal sites, POL facility hardening, etc.) at a number of European and Pacific bases. The total program presently envisioned would ultimately provide shelter for a significant number of aircraft and other high-value aviation equipment, together with the full range of other vulnerability measures—at a total cost of about \$178 million. I urge the Congress to provide the \$26 million included in our fiscal year 1968 request so that we may get started promptly on this critical program.

TACTICAL EXERCISES

Under normal peacetime conditions, large scale strategic mobility and tactical exercises contribute to the maintenance of high combat readiness, provide highly visible demonstrations of our capabilities, help test new operational concepts and weapon systems, and permit U.S. and allied forces to perfect coordination procedures which they would have to use in wartime. However, with the expansion of combat operations in southeast Asia during the past 18 months, the importance of simulating such operations has dropped sharply and in fiscal year 1966, only about \$9 million was used for the larger exercises "directed" or "coordinated" by the Joint Chiefs of Staff. Therefore, on the assumption that the Vietnam conflict will continue through fiscal year 1968, we have budgeted only \$27 million for this purpose, far below the \$100 million plus level of pre-Vietnam years.

FINANCIAL SUMMARY

The General Purpose Forces program outlined above will require total obligational authority of \$35.4 billion in fiscal year 1968.

A comparison with prior years is shown below:

[In billions of dollars]

	Fiscal year—						
	1962 actual	1963 actual	1964 actual	1965 actual	1966 actual	1967 estimate	1968 proposed
Total obligational authority	18.0	17.9	18.0	19.1	29.5	34.3	34.4

AIRLIFT AND SEALIFT FORCES

Included in this program are the Military Airlift Command transports, the Air Force's troop carrier aircraft assigned to the Tactical Air Command and the unified commands, the transport and troop carrier aircraft in the Air Force's reserve components, and the troop ships, cargo ships, tankers and "forward mobile depot" ships operated by the Military Sea Transportation Service.

Although not specifically included in the airlift/sealift program, those elements of other major programs whose missions and capabilities are closely related to the general requirement for lift have also been considered in determining what forces should be provided here. These other elements include such specialized transportation forces as the carrier-on-board delivery aircraft of the Navy and the cargo aircraft of the Marine Corps.

Within the context of this specific program, the lift mission consists of two main tasks: the strategic requirement for transport support of military operations in overseas areas and the tactical requirement for intratheater and assault airlift. The strategic task can be further divided into the requirement for the initial rapid military response to distant crises and the longer term requirement for continuing support and resupply of overseas military operations. This distinction is very important because it helps determine what kind of equipment is needed, when it must be available, how it should be organized and deployed, and who should control it. As you know, during the past several years, our principal concern in the airlift/sealift area has been to build up a quick-reaction capability adequate to meet our global security commitments. More recently, our experience in supporting a major military deployment in southeast Asia has focused our attention on the problems of providing lift support over the longer term, and especially under conditions when it is not feasible to requisition commercial shipping.

STRATEGIC MOVEMENT

All of our studies show that the length and cost of a war, as well as the size of the force ultimately required to terminate it favorably, are importantly influenced by how fast we can bring the full weight of our military power to bear on the situation.

In previous posture statements I have discussed at some length the range of strategies available to us for meeting the requirement for such prompt and effective response to distant military contingencies. Basically, these choices range from reliance on large ready forces deployed overseas in advance of need, to reliance on a central reserve of men and equipment in the United States to be deployed by airlift and sealift as required. A strategy which combines features of both these extremes might provide for prepositioning equipment and supplies overseas, either on land or aboard ship, with the men to be airlifted in as needed. Although each of these approaches has its own advantages and disadvantages with respect to operational flexibility, foreign exchange costs, total manpower and equipment requirements, etc., the strategy of a mobile central reserve supported by an adequate lift capability and balanced prepositioning has long been accepted as the preferred alternative for meeting the rapid response objective.

During the past several years, the Defense Department has been embarked on a major effort to achieve the rapid deployment capability needed to support such a strategy. Now, we are buying a new transport, the C-5A, which will enable us to make another major improvement, both qualitative and quantitative, in our strategic airlift capacity. Thus, when our presently planned six squadrons of C-5A's are all in the force in fiscal year 1972, our airlift capacity will be more than 10 times what it was in fiscal year 1961.

Over the years, forward prepositioning of military materiel, especially heavy and bulky equipment, has grown in importance, partly because of the great increase in our ability to airlift forces and partly because of the emergency of new prepositioning concepts and equipment. The most important of these concepts has been the "forward floating depot" (FFD), in which balanced stocks of equipment and supplies are maintained on ships stationed overseas within a few days steaming distance of potential trouble spots, and thus very quickly available to "marry up" with airlifted forces from the central reserve. As a first generation "floating depot" system we planned to use old Victory-class ships, specially modified for this purpose. Three of these ships were actually deployed in fiscal year 1963 and we had planned to add more this year. However, the requirements of the conflict in southeast Asia have now caused us to defer this deployment for the time being.

Our future plans call for this first generation system to be replaced by a new class of ships, the FDL's, which are being specifically designed to support a rapid deployment strategy. Unlike the relatively slow (16 knots) and small payload (2,265 short tons) Victory ships, the FDL's will be fast, large payload (8-10,000 short tons) ships capable of rapidly delivering cargo either over the beach, using embarked lighters and helicopters, or at established ports. Because of these improvements, the FDL's will provide a wider range of operational flexibility than the Victory's. While we would probably always want to have some of them fully loaded and deployed forward, some of them could also be held partially loaded with ammunition and supplies but in a ready status in either U.S. or overseas ports where vehicles, helicopters, etc., tailored to the mission, could be placed on board quickly as the situation requires. This mode of operation which is feasible only because of the speed and efficiency of the FDL's would allow us to meet the desired rapid deployment schedules without immobilizing indefinitely large amounts of high cost equipment some of which also requires substantial continuing maintenance. In either mode of operation, however, the FDL's would have to be committed to the rapid deployment mission at all times and would not be available for regular point-to-point service. Thus while they will make an enormous contribution to our rapid deployment capability and will also be highly efficient carriers for resupply after the initial deployment phase, these FDL's in themselves do not provide the answer to the overall sealift problem.

Indeed, all of our study and experience shows that the requirement for sealift continues to grow after the initial buildup phase, as more forces are deployed and stocks of consumables have to be replaced. To meet this larger and longer term need, we must rely in large part on merchant shipping. Based on the transportation re-

quirements implicit in our contingency planning for a number of the most likely limited war situations, it appears that the equivalent of up to 460 general cargo ships (averaging 15,000 MT capacity, 15-knot speed) might be needed in a future emergency, over and above those available in our own Airlift/Sealift Forces. Simply in terms of size, the U.S. Flag Merchant Fleet (Active and Reserve) is adequate for such contingencies now, and should continue to be so in the future. The real problem, underscored by our recent experience in supporting our southeast Asia deployments, concerns the availability of these U.S. flag merchant ships to the Defense Department on a timely basis.

For the past year and a half, we have been engaged in a massive sealift of men and supplies to Vietnam. In the first quarter of fiscal year 1967, the Military Sea Transportation Service (MSTS) exceeded its fiscal year 1965 average quarterly shipping rate by 165 percent. However, only about a third of the increase was obtained from the U.S. liner fleet (both subsidized and unsubsidized). These, of course, were the ship operators who had been given preference in carrying peacetime Defense cargoes, who up until recently (when MSTS introduced competitive bidding) had collectively negotiated freight rates with MSTS, and on whom Defense had traditionally counted for the "hard core" of its sealift augmentation in wartime. But, when the heavy demands for sealift to southeast Asia began to develop, most of the liner operators chose to continue to ply their normal commercial trade routes, and in the July-September 1966 period only 8 percent of the subsidized fleet and something less than 10 percent of the non-subsidized liner fleet were under charter to MSTS. This choice was understandable under the circumstances. In a total war, neither the Government nor the shipline operators would have any choice, the ships would be requisitioned. But in a limited war, such as Vietnam, the issue is not as clear; the shipline operators, understandably, don't want to lose their place on the world trade routes and the Government doesn't want to be forced to requisition the ships it needs.

Fortunately, in the present situation, we have been able to obtain the needed sealift without recourse to requisitioning, principally through the use of the unsubsidized tramp fleet and through reactivations from the Reserve Fleet (NDRF). Almost two-thirds of the increase in Defense sealift capacity achieved since the start of the Vietnam buildup has come from these sources.

While these resources have successfully met the needs of the present emergency, they may not all be available in another emergency a decade hence. By 1975, most of the ships in the NDRF will be 30 to 35 years old and will require larger expenditures for conversion to assure satisfactory reliability. Moreover, the unsubsidized tramp/irregular fleet will probably have disappeared because its aging World War II vessels cannot be replaced at an economical price. As a result, the Defense Department may in another emergency be far more dependent on the subsidized berth line operators than it is today.

The greater requirement for berth line ships is disturbing not only because of the problem of responsiveness; but also because of the cost implications involved. We know from past experience (and we cannot realistically expect it to be otherwise) that, unless the operators are assured a good profit (at prices established in a tight market), their ships will not be forthcoming voluntarily in an emer-

gency. This makes the subsidized liner fleet a very costly form of sealift for the Defense Department to hire, just when it needs it most.

Furthermore, U.S. flag ships are twice as expensive to operate, even in normal times, as most foreign flag ships. And, as I mentioned earlier, ship construction in U.S. yards costs about twice as much as that abroad. To offset these cost differentials, the U.S. Merchant Marine is subsidized by the taxpayer, directly and indirectly, to the tune of nearly three-quarters of a billion dollars a year—on the premise that this shipping is required for potential national security needs. Yet, despite this large annual subsidy, virtually all our sealift needs since World War II have been met without requisitioning merchant ships. Moreover, it seems clear that the most likely requirements for sealift augmentation in the future will be associated with limited war situations like Vietnam, in which recourse to requisitioning will be as undesirable as it seems today.

In summary, from the viewpoint of the Defense Department, there is a firm requirement for reliable, responsive sealift augmentation for a wide range of limited war situations, a requirement which the present subsidized U.S. liner fleet, for various reasons, has not met. Various solutions have been suggested, ranging from a major increase in the subsidized U.S. flag merchant fleet to a full scale program of reserve fleet modernization. I do not propose to offer a solution at this time; other agencies of the Government are also involved. I believe a way can be found to revitalize both the American shipbuilding industry and the U.S. Merchant Marine and make them both more truly competitive in the world markets—and I believe that these objectives, along with our military requirements, can be met at costs lower than those our nation is incurring today.

AIRLIFT

The airlift forces currently planned through fiscal year 1972 are shown on the classified table provided to the committee. In the active forces, the C-5A deployment schedule is the same as that envisioned a year ago with the first two squadrons scheduled to become operational in fiscal year 1970. The first operational aircraft were included in the current year's procurement program and \$423 million is included in the fiscal year 1968 request for the next increment. The total C-5A program cost (including research and development and facilities construction) is estimated at \$3.4 billion.

Last year we had tentatively scheduled the phaseout of the C-133 fleet from the active forces in fiscal year 1971. However, in order to maintain the squadron integrity of the Military Airlift Command's force structure, we now plan to phase out the last two squadrons of C-133's as the last two C-5A squadrons become operational.

We also plan to retain one additional C-124 squadron (16 UE aircraft), previously scheduled to be phased out this year, through fiscal year 1968.

The C-141 force will reach its planned strength of 14 squadrons in fiscal year 1968 and is scheduled to hold at that level throughout the program period.

Before the end of fiscal year 1967, we plan to reorganize the existing C-130 fleet within a force structure of 28 squadrons rather than the 31 previously planned.

As a result of an Army-Air Force agreement in April 1966, which redelineated certain air support mission responsibilities within the combat theater, the Army's CV-2 Caribou transports (redesignated the C-7A) have now been transferred to Air Force operation and are therefore, accounted for in this program for the first time.

No major changes are contemplated in the airlift force structure of the Reserve components from that proposed a year ago. In fiscal year 1968, we proposed to continue one C-121 squadron and one more C-97 squadron than planned last year. Eventually, the Reserve airlift force will consist entirely of C-130's. During fiscal year 1968, we propose to continue the 100 percent manning for the 11 Air Force Reserve C-124 squadrons, which was inaugurated as a readiness measure in the summer of 1965.

SEALIFT

As discussed earlier in this section, we propose to build a fleet of fast deployment logistic (FDL) ships. The Congress approved funds (\$67.6 million) for two of these ships in fiscal year 1966, including \$10 million in the fiscal year 1966 supplemental for the initiation of contract definition. As I explained a year ago, actual contracts for these first two ships are being deferred in order to permit their inclusion in the "total package" contract. We now plan to award the multiyear contract late this fiscal year. Funds for five FDL's are included in the fiscal year 1968 request.

The FDL's we now propose will be considerably larger, faster, and more efficient ships than those we originally envisioned. Two years ago, the preliminary FDL concept called for a vessel capable of carrying about 5,600 tons of division equipment and supplies; the ships we are now considering will be able to carry perhaps twice that tonnage and at an estimated increase in the cost per ship of less than 10 percent.

As I noted earlier in the discussion of the shipbuilding problem, the FDL program represents the first application of the concept formulation and contract definition process and the "total package" approach to ship procurement. The first phase of this approach, "concept formulation," was completed in July 1966 when three contractors were awarded definition contracts. During the first phase of contract definition, the competing contractors prepared their initial proposals around Army and Navy performance requirements and standards instead of detailed ship specifications. Thus, for the first time, the talents of private industry are being brought to bear on the initial design of the ship. During the second phase of the definition process, which has just been completed, the three competing contractors prepared detailed proposals for their design and a comprehensive program plan for their production. As part of these detailed proposals, each of the contractors has developed plans for a new shipyard or modernization of an existing one. Any one of these, in terms of efficiency, would be far superior to the existing U.S. yards and in terms of design and layout would be equal to the best of the foreign yards.

We are now in the last stage of the definition process, i.e., bid evaluation and source selection.

The three Victory-class cargo ships which had been used as forward mobile depots since fiscal year 1963 have been temporarily converted

to point-to-point service in support of our current effort in southeast Asia. Our plans now call for retaining these ships in this role through the end of fiscal year 1968. Subsequently, with the end of the Vietnam conflict, we would expect to return them to their forward mobile depot role and add more ships for this mission. The Victory ship fleet would be retained until a sufficient number of the more efficient FDL's became available in fiscal year 1970.

During fiscal year 1966, MSTs operated in the nucleus fleet an additional general purpose cargo ship to help meet the increased requirements of our southeast Asia operation. Tentatively, we now plan on retaining this ship through fiscal year 1968, after which the active general purpose cargo fleet is scheduled to decline. Another minor change in last year's planned deployments resulted from the fact that one roll-on/roll-off ship which had been expected to enter service in May or June 1966 has been delayed.

With respect to special purpose cargo ships, the temporary Vietnam augmentations which I described a year ago have now been extended through fiscal year 1968. In addition, MSTs will operate 13 more LST's in fiscal year 1967 than envisioned last year and 1 more through fiscal year 1968. After fiscal year 1968, the special purpose cargo fleet is tentatively scheduled to return to the pre-Vietnam level.

FINANCIAL SUMMARY

The airlift and sealift forces outlined will require total obligational authority of \$1.6 billion in fiscal year 1968. A comparison with prior years is shown below:

[In billions of dollars]

	Fiscal years—						
	1962 actual	1963 actual	1964 actual	1965 actual	1966 actual	1967 esti- mated	1968 pro- posed
Total obligational authority.....	1.1	1.1	1.2	1.4	1.7	1.5	1.6

RESEARCH AND DEVELOPMENT

Included in this major program are all the research and development efforts not directly identified with weapons or weapon systems approved for deployment. We have made a special effort again this year not only to cull out marginal projects in the research and development programs, but also to defer to future years all projects whose postponement would not have a serious adverse effect on our future military capabilities. But even while we have eliminated, reduced and deferred projects in some areas of this program, we have had to add, increase and accelerate projects in other areas, to meet new needs growing out of the conflict in southeast Asia and the military situation generally.

Last year I described Project Provost (priority research and development objectives for Vietnam operations support) which we had established to ensure that the research and development program related to limited war situations, which had been accelerated in prior years, would be wholly responsive to the more specific requirements

of our forces in southeast Asia. As a result of Provost, projects totaling about \$370 million were identified as having significant potential for Vietnam operations and were singled out for priority funding in fiscal year 1966. During the past year, the test of combat in Vietnam has revealed a number of areas where still more effort appears warranted. These newly identified requirements have been an important influence in the formulation of our fiscal year 1968 request. However, most of this work should be started promptly, and thus also concerns the current year's research and development program. While a portion of it has been financed by reprogramming or use of emergency funds, we have had to request an additional \$135 million for research, development, test, and evaluation (R.D.T. and E.) in the fiscal year 1967 supplemental.

Broadly speaking, the projects funded in the supplemental can be grouped into three main categories. The first is concerned with improving the ability of our forces to fight at night. The second is concerned with reducing our aircraft losses. The third is concerned with the development of improved counterinfiltration systems. As described later, the proposed fiscal year 1968 program provides for additional effort in all of these areas.

Before I turn to the specifics of the fiscal year 1968 research and development program, there are two general areas which might usefully be discussed as entities rather than in terms of the separate projects which they comprise. These are nuclear testing and test detection, and space development projects.

NUCLEAR TESTING AND TEST DETECTION

As you know, the Defense Department, in cooperation with the Atomic Energy Commission (AEC), is maintaining four specific safeguards with relation to the Test Ban Treaty. For the Defense Department's portion of this program, we have budgeted a total of \$255 million for fiscal year 1968, compared with \$224 million in fiscal year 1967 and about \$238 million in fiscal year 1966, as shown on the classified table provided to the committee.

In support of the first safeguard—the underground test program—we have included \$49 million in the fiscal year 1968 budget, compared with the \$33 million provided in the fiscal year 1967 program.

In support of the second safeguard—maintenance of modern nuclear laboratory facilities and programs in theoretical and exploratory nuclear technology—our fiscal year 1968 budget includes \$63 million as compared with the \$53 million in fiscal year 1967.

The fiscal year 1968 budget includes about \$27 million in support of the third safeguard—the maintenance of a standby atmospheric test capability—about the same as fiscal year 1967.

In support of the fourth safeguard—the monitoring of Sino-Soviet nuclear activities—we have included a total of \$116 million in the fiscal year 1968 budget, compared with \$111 million in fiscal year 1967. We conduct two principal programs to support this safeguard—the Advanced Research Project Agency's Vela program and the Atomic energy detection system (AEDS).

The fiscal year 1968 budget includes \$50 million for Vela activities.

The present atomic energy detection system (AEDS), designed to detect and identify nuclear detonations, now represents a facilities investment of about \$85 million.

About \$58 million was provided in the fiscal year 1964-67 budgets for this effort and \$16 million is included in the fiscal year 1968 request. An additional \$46 million will be needed in fiscal year 1968 for the R.D.T. & E. and operating costs of the system.

SPACE DEVELOPMENT PROJECTS

While the various elements of the Defense Department's space effort are spread, on a functional basis, throughout the program and budget structures, I believe this effort can be more meaningfully discussed as a separate entity.

The Defense Department's program is, of course, wholly integrated into the larger national space program, expenditures for which now total over \$7 billion a year. The Defense portion is designed to maximize the utilization of space technologies and environments for defense purposes, e.g., to apply space technologies and capabilities to our strategic and tactical weapon systems to increase their effectiveness, to exploit the new potentials in information systems made possible by satellite-based communications and sensors, and to explore the usefulness of manned space systems for defense purposes.

In total, about \$1,998 million of our fiscal year 1968 budget request is for the space program, \$328 million more than in fiscal year 1967.

Spacecraft mission projects

By far the largest project in this category is the Manned Orbiting Laboratory (MOL), for which we are requesting \$431 million in fiscal year 1968.

A total of \$83 million is requested in fiscal year 1968 to continue work on Defense satellite communications programs and to procure, operate and maintain satellite communications equipment.

Of the \$83 million requested for satellite communications programs in fiscal year 1968, about \$17 million is for the development, procurement and operation of Army ground terminals; \$13 million is for Navy shipboard terminals; and \$49 million is for Air Force space subsystems, airborne terminals, launch vehicles, and the costs of procuring and launching new satellites. In addition, \$3 million is for the Defense Communications Agency for overall systems engineering and management direction.

I have already discussed the next item, "Nuclear test detection (Vela)," in connection with the Test Ban Treaty safeguards. The fiscal year 1968 budget includes about \$8 million for this program.

We are requesting \$18 million for the Navy's satellite navigational system.

Research and development funding for the antisatellite system program has been completed. The funds requested for fiscal year 1968 will provide for the normal operating costs of the system.

The funds requested for space "Geodesy" will support programs by each of the services as well as the Department of Defense's participation in the national geodetic satellite program. * * *

Vehicle, engine and component developments

The Titan III family of space boosters has begun to enter the operational inventory. The first Titan IIIB (Agena configuration) was launched last July and production is now proceeding. The Titan IIIC has been in the flight test phase since June 1965 and is

being used to launch the initial defense communications satellite, Vela, tactical communications satellite, and multiple engineering payloads.

The funds requested for "Agena D" will continue work being initiated this year to increase the capability of the standard Agena D for the heavier satellite payloads now projected.

The funds requested for "Spacecraft technology and advanced reentry tests (START)" will complete the present phase of this program.

The funds requested for "Advanced space guidance" will support an ongoing program of studies, experiments and equipment development in such areas as long-term accuracy and reliability of inertial guidance components, horizon sensors and star and landmark trackers, and on-board determination of astronomical data for autonomous navigation. The fiscal year 1968 program includes procurement of an inertial reference unit (which will serve as an instrumentation standard for the sensors) and other navigation components, which will then be flight tested.

The "large solid propellant motor" project was undertaken to create the technology base required for the development of missile or launch vehicle engines up to 156 inches in diameter. Funds already provided will be sufficient to complete the remaining tasks, i.e., demonstrations of a low cost nozzle, an advanced thrust vector control system, and a self-eject launch concept.

The next item, "Advanced liquid rocket technology" comprises three projects: advanced storable liquid rocket technology; high performance, cryogenic liquid rocket technology; and maneuverable space rocket technology.

Other Defense activities supporting the space program

The ground support category shown on the classified table supplied the committee is that portion of the costs of the missile range, test instrumentation, and satellite detection and tracking systems which is charged to space activities. The largest item in this category is the \$132 million for the Eastern Test Range.

The fiscal year 1968 request includes \$34 million for support of Spacetrack and \$5 million more for SPASUR, for a total of \$39 million.

The \$57 million requested for the "satellite control facility" is for operation, maintenance, and modification of the military space vehicle support network which provides satellite tracking, command and data handling, as required by the major Defense space programs.

The last two categories on the table, "Supporting research and development" and "General support," constitute the overhead of the military space program and consist of prorated portions of the costs of a wide range of space-related activities.

RESEARCH

Last year I discussed in considerable detail the problems involved in organizing and managing a research program consisting of literally thousands of individual tasks and projects, most of which require relatively small amounts of money for their support. I pointed out that because of the large number and relatively small dollar value of these projects, we had to manage the program from my office on a

"level of effort" basis, with the objective of advancing our knowledge in a balanced manner across the entire spectrum of science and technology pertinent to the Defense effort. To facilitate the management of the program and to insure that it is always responsive to changes in our fields of interest, I noted that we had organized the overall effort primarily in terms of disciplines, i.e.; materials, general physics, chemistry, oceanography, etc., and that the effort in each discipline was allocated among the components of the Department on the basis of their primary fields of interest and competency.

Show on figure 6 is the research program proposed for fiscal year 1968, compared with prior years. You will notice that there is a sharp reduction in the amount of funds allocated to materials research and to a lesser extent for in-house laboratory independent research. In both cases, the amounts of unobligated and unexpended funds exceeded the levels dictated by prudent management. Accordingly, the amount of new funds requested for fiscal year 1968 has been reduced below the actual program levels which will be about the same as in fiscal year 1967.

FIGURE 6

Summary of the research program

[TOA, in millions of dollars]

	Fiscal year—						
	1962	1963	1964	1965	1966	1967	1968
Engineering sciences:							
Electronics.....			26	27	28	28	27
Materials.....			34	44	45	47	33
Mechanics.....			25	26	20	29	28
Energy conversion.....			12	14	14	15	14
Subtotal.....			97	111	116	119	102
Physical sciences:							
General physics.....			28	30	33	30	30
Nuclear physics.....			15	17	15	16	13
Chemistry.....			10	11	11	11	11
Mathematical sciences.....			33	35	37	38	37
Subtotal.....			86	93	96	95	91
Environmental sciences:							
Terrestrial.....			6	6	7	6	6
Atmospheric.....			19	20	19	21	22
Astronomy-astrophysics.....			8	9	10	10	9
Oceanography.....			18	19	19	20	22
Subtotal.....			51	54	55	57	59
Biological and medical sciences.....			34	33	33	34	32
Behavioral and social sciences.....			9	10	12	13	12
Nuclear weapons effects research.....			36	38	39	41	43
In-House independent laboratory research.....			35	39	35	36	34
University program (THEMIS).....						18	27
Other support.....				8	7	7	8
Total research.....	339	351	346	383	391	415	409

! Amounts will not necessarily add to totals due to rounding.

Included in the fiscal year 1968 request for research is \$27 million for the Defense Department's share of the national program for developing new centers of excellence in science and technology. This program, previously referred to as the "university program" and now called THEMIS, is in addition to our regular contract/grant arrangements with institutions of higher learning and is not a substitute for

them. Rather, the new program is designed to create, eventually, about 100 new departmental centers of superior scientific and engineering competence at universities which are, at present, poorly supported. Patterned after the joint services electronics program, from which significant technical advances like the laser evolved, this new effort holds great promise of yielding a similar "payoff" in the future.

We have initiated Project THEMIS this year at a level of \$18 million, and have supplied interested colleges and universities with detailed information on our requirements. Additional centers will be started in fiscal year 1968.

EXPLORATORY DEVELOPMENT

Exploratory development is directed toward the expansion of technological knowledge and its exploitation in the form of materials, components, and devices which it is hoped will have some useful application to new military weapons and equipment. Here the emphasis is on invention and on exploring the feasibility of various approaches to the solution of specific problems, up to the point of demonstrating feasibility with a "bread board" device and even, in some cases, prototype components and subsystems. Along with research, exploratory development forms the technological pool from which future equipment will be designed.

The more than 800 individual exploratory development projects represent about 15 percent of the cost of the entire R.D.T. & E. program, with the average project requiring about \$1.3 million annually. About 40 percent of exploratory development work is conducted by our in-house laboratories, 50 percent is contracted to industry, and the remaining 10 percent is performed by educational and nonprofit institutions. A recent study of the origin of weapon system performance improvements has shown that almost all have resulted from Defense supported technological advances and very little from other sources.

As shown on the classified table provided to the committee, we are requesting a total of \$988 million for exploratory development in fiscal year 1968, \$65 million less than the revised estimate for fiscal year 1967.

Army

For the Army's exploratory development program, \$216 million is requested for fiscal year 1968, somewhat less than the level planned for fiscal year 1967.

In the areas of electronics and communications, the development effort includes: small rugged field operated digital data processing equipment; communications equipment having increased traffic handling and improved antijamming capabilities; devices for rapid, positive, and automatic recognition and identification among friendly surface units and between them and their supporting air units; new sensors for airborne and ground surveillance and target acquisition of enemy units on the battlefield; communication sets and variable time fuzes; night vision devices; improved solid state, thermionic, and frequency control components common to a variety of equipments; etc. Efforts in the ordnance category include work on weapon systems for Army helicopters, the improvement of missile components,

and development of conventional ammunition, weapons, and explosives.

In the materials category, the Army is concerned with the development of new metals, ceramics, plastics, and composite materials which can improve its firepower, mobility, armor, and communications, with particular emphasis on high strength, lightweight materials for use in the field.

Navy

The Navy's exploratory development effort in fiscal year 1968 will require \$272 million, compared with \$283 million now estimated for fiscal year 1967. Approximately one-third of the Navy's program is devoted to improving the design of ships, aircraft and other "sea-based" warfare systems, including: higher performance, lower cost nuclear propulsion systems for surface ships and submarines; sea-based countermeasures to help protect ships against mines, torpedoes, air-to-surface missiles, and nuclear attack; and better shipboard radar and sonar equipment to improve target acquisition, surveillance, and navigation. A large number of projects are directed toward developing new or improved materials, equipment, and designs for ships; in the past, these efforts have produced the "captured air bubble" craft, hydrofoil craft, and ship hulls for penetrating heavy ice formations.

Another large share of the Navy's program is concerned with electronics and communications, in particular with improving the performance and reliability of complex sea-based electronic systems which are subject to extreme variations in temperature, humidity and shock. New surveillance, navigation, and communications equipment for Navy aircraft is also of major interest.

A third major area, "Ordnance," comprises a large number of projects in such areas as antisubmarine warfare, mine warfare, air- and shipboard-launched ordnance as well as component work in propulsion, fuzes, explosives, pyrotechnics, ballistics, and infrared and laser devices.

Air Force

Previously the Air Force had budgeted separately for the supporting laboratory expenses associated with the exploratory development program. As part of an overall restructuring of its exploratory development program, these expenses have been prorated to the over 200 individual projects which the laboratories support. The other services have been prorating their laboratory costs for a number of years.

A portion of the Air Force's exploratory development program, for which \$285 million is requested in fiscal year 1968, will again be devoted to space investigations and space-related projects. Each of the categories, except for ordnance, includes some space-related projects. For example, a large share of the funds for "Chemical technology" will be devoted to the development of propellants and propulsion systems for missiles and rockets, and hence for space boosters. "Aeronautics" includes projects which cover the entire speed/altitude regime from V/STOL flight to space and reentry technology. These projects are directed toward developing the technology and understanding for extending Air Force operations into new operational environments such as hypersonic flight, for improving the capabilities of present aircraft, and for reducing the cost of future aircraft developments.

As a part of the reorganization of the Air Force's exploratory development program a "Bioastronautics" category was created embracing the Air Force's effort in the life sciences, aviation medicine, and machine-environmental systems support for aircraft and space activities. The funds requested for this category will support the activities of the seven Aerospace Medical Division laboratories as well as development of the life-support systems for the Manned Orbiting Laboratory.

The closely related areas of communications, electronics and avionics account for about one-third of the Air Force's program, while only a relatively small effort is conducted in the area of conventional ordnance. With respect to "materials," the Air Force is exploring new composites having enhanced radiation and blast, and X-ray resistance; metals with improved strength and stiffness; and sealant and elastic materials formed from the new polymers.

Advanced Research Projects Agency (ARPA)

ARPA operates as a small research and development management team, supervising its service-conducted programs by overall financial control and technical direction. A total of \$215 million is included in the fiscal year 1968 budget for ARPA's projects in exploratory development, compared with \$231 million in fiscal year 1967 and \$225 million in fiscal year 1966.

Project Defender. The Defender program is the principal exploratory development effort designed specifically to provide the missile and reentry technology associated with strategic defensive and offensive systems, and to develop concepts for advanced defensive systems against ballistic missile attacks. In fiscal year 1968, a substantial portion of the \$118 million requested for this project will be devoted to missile reentry and midcourse phenomenology.

Project Vela. Project Vela has already been discussed in connection with the test ban safeguards program. For fiscal year 1968, \$50 million is requested, slightly more than in the current fiscal year.

Project Agile. For fiscal year 1968, \$27 million is requested for Project Agile, about the same as fiscal year 1967. This is our basic research and development effort oriented to the special problems of remote area conflict with particular reference to the requirements of insurgency warfare.

ADVANCED DEVELOPMENT

This category includes projects which have advanced to a point where the development of experimental hardware for technical or operational demonstration is required prior to the determination of whether the item should be designed or engineered for eventual service use. In contrast to engineering development where design specifications are employed, advanced development permits the use of performance specifications which allow the engineer greater latitude in meeting operational needs, thereby encouraging innovation. A total of \$1,250 million is requested for advanced development in fiscal year 1968 compared with \$922 million in fiscal year 1967 and \$807 million in fiscal year 1966. The sharp increase in fiscal year 1968 reflects the growth of a few major projects, most notably MOL.

V/STOL developments

The first two items under Army "Advanced development" are related to the Defense Department's total V/STOL effort in which all

three military departments are participants. For a number of years, the Department has been developing a variety of vertical and short takeoff and landing (V/STOL) aircraft. This program has focused on the construction of prototype aircraft suitable for operational testing by all three services. The present status of this program is recapitulated below:

The XC-142A, a tilt-wing turboprop transport with a cruise speed of 250 knots, a combat radius of 200 nautical miles, and a 4-ton payload, has been undergoing technical and operational evaluation by a triservice test group with some participation by NASA and the FAA. The \$3 million requested for "Triservice V/STOL" in fiscal year 1968 (under Air Force advanced developments) should complete funding of the test program. These aircraft are approaching their maximum safe life of 300 flight hours and costly life extension modifications would not be warranted.

The X-22, a Navy monitored triservice V/STOL research and development project, is a twin tandem, tilting-duct, fan-powered flight vehicle, which closely simulates the characteristics of conventional aircraft and was designed to provide technical data on stability and control criteria for V/STOL aircraft generally. The \$2 million in the fiscal year 1967 budget will be sufficient to complete the presently scheduled DOD test program for the X-22. The remaining aircraft may then be turned over to NASA for further testing.

The XV-6A (P-1127) is a British designed, lightweight V/STOL strike-reconnaissance aircraft, first flown in October 1960. A total of nine test aircraft were constructed under a joint program with the United Kingdom and Germany. The tripartite evaluation of the aircraft was terminated in 1965, although the United States continued to conduct operational tests of its six aircraft until July 1966. Two of these aircraft have been turned over to NASA while the other four will be held by the Air Force pending evaluation of further testing proposals.

Two XV-4A's, an augmented jet lift aircraft, were tested by the Army until May 1965. One aircraft was lost during the testing period and the other, which was turned over to the Air Force, will be modified with direct lift and diverted thrust engines and designated the XV-4B. It is to be utilized in the Air Force's VTOL integrated flight control program.

The second of two XV-5A's, an experimental fan-in-wing aircraft, crashed last September while being operationally evaluated as a rescue aircraft. (The first crashed in April 1965.) All of the remaining assets associated with the program have now been transferred to NASA.

Another V/STOL effort just getting underway is the joint development of a strike fighter aircraft with the Federal Republic of Germany. The \$3 million provided in fiscal year 1967 should complete the financing of the configuration (i.e., contract) definition phase. At present, this effort is directed to V/STOL technology rather than full scale engineering development. Each nation will make its own decision concerning production. Since a decision on prototype development cannot be made until we have thoroughly reviewed the configuration definition results

(now scheduled for completion in October 1967), no additional funds have been requested for fiscal year 1968, although they would be needed if the program were continued.

The Army's "new surveillance aircraft" project is now a continuing long-range study effort concerned with the determination of desirable characteristics of a reconnaissance and surveillance aircraft for the mid-1970's.

In summary, we are now coming to the close of the current phase of our V/STOL development effort. For this reason, our overall effort on V/STOL development will decline in fiscal year 1968, although the services will continue to reexamine the results of these programs and how these may be applied to future aircraft needs. In any event, it appears that a great deal of research and experimental work, particularly on propulsion systems, remains to be done before we will be ready to undertake full scale engineering development of a V/STOL aircraft. NASA, of course, will continue its research and development effort in the V/STOL area.

Army

I have already discussed the first two items on the Army's list of advanced developments, ("operational evaluation V/STOL" and "new surveillance aircraft"). No additional funding is needed for the third item, "heavy lift helicopter." This is the CH-54 "flying crane" which is now in operational use in Vietnam.

Funds are requested for the "research helicopter" in fiscal year 1968. The fiscal year 1968 funds will be used to build wind tunnels and dynamic scale models of the stowed- and tilt-rotor versions. The program is oriented primarily to the development of technology which will yield an efficient aircraft that will both hover and have a flight speed of about 400 knots.

The funds requested for "Aircraft suppressive fire systems" is for work on improved helicopter-borne weapons for our forces in Vietnam, including evaluation of various fire control systems, guns, missiles and rockets. About half the funds will be used for feasibility demonstrations of presently available missiles and rockets, and most of the balance on advanced fire control systems and optical sighting devices.

The next item, "Automatic data system/Army in the field," covers the development of electronic data processing (EDP) equipment needed to help maintain and analyze data for the field commander regarding the current tactical status of his own and enemy units and of his various tactical plans and alternatives. Contracts for initial equipment have been awarded and the Army plans to begin field experiments with the 7th Army in Europe.

The SAM-D, for which funds are requested in fiscal year 1968, is an advanced surface-to-air missile system previously mentioned in connection with both the Strategic and General Purpose Forces. SAM-D is now in contract definition phase which will be completed this spring. We will then have to decide whether to proceed directly with development of an integrated system suitable for direct operational deployment, to limit development to a prototype system for feasibility demonstration, or to return to concept formulation. The second option would provide additional time to incorporate still more advanced technology and lead to demonstration tests. The first option would lead to full service tests. The funds requested will support any

option. The major remaining task is to integrate into a working model a number of components, the feasibility of which has already been verified on an individual basis. The SAM-D program is closely related to the Navy's advanced surface-to-air missile system program and the development of the respective subsystems and components is being fully coordinated by the two Services.

The \$6 million of "DOD satellite communication, ground" covers the Army's portion of the Defense satellite communications programs, which were discussed earlier.

The \$20 million requested for "Nike-X advanced developments" will finance development of those advanced components whose lead times would not permit their incorporation in an early deployment of the system. This work fills the gap between the engineering development effort and the development of completely new hardware for possible use later.

The \$5 million requested for "antitank weapons" will provide for the evaluation of new antitank missile concepts. Present efforts are directed toward identifying those system characteristics which together seem to offer the best chance of achieving an effective low cost antitank weapon.

The funds requested for the "lightweight howitzer" will support the development of a 155 mm. self-propelled weapon. Development of the system is being coordinated within NATO, with the United States, France, Germany, and Canada all participating in designing the ammunition.

The "Limited War Laboratory," for which \$7 million is requested in fiscal year 1968, is the Army's quick reaction research and development facility for counterinsurgency operations.

The "therapeutic developments" program was initiated in calendar year 1965 in response to the drug-resistant falciparum malaria which was causing such a serious problem for our forces in southeast Asia. The \$11 million requested will continue the development and testing of new anti-malarial drugs.

The next item, \$12 million for "Power system converters," consists of four major categories of projects directed toward the development of engines, transmissions, final drives, and related components for combat and tactical vehicles. These categories are: power conversion for track and wheel vehicles; multifuel, variable compression engines; spark ignition engines; and rotary combined cycle power systems.

The funding requested for "Night vision" reflects the increasing importance of night operations in modern warfare. Among the many types of equipment now under development are starlight scopes, small portable radars and special goggles.

The last item on the Army's list, "Airborne surveillance and target acquisition," is also in large part concerned with the problems of night operations. One of the major efforts in this program is aimed at providing a better night reconnaissance capability.

Navy

The first item on the Navy's list, "V/STOL development," represents the Navy's current participation in the triservice V/STOL program previously described.

The next item, "Airborne electronic warfare equipment," for which funds are requested, is a multiproject effort aimed at developing

active (jamming) and passive (signal interception) electronic warfare equipment required by the Navy:

The "advanced surface-to-air missile system (ASMS)" is the new automated integrated air defense system being developed as a possible replacement for the Terrior-Tartar-Talos (3-T) systems. As mentioned previously, we are seeking in this development to maximize the use of the technology, components, and subsystems, developed for the Army's SAM-D system. As a result, the ASMS program must lag behind the SAM-D development by about 1 year. With the completion of SAM-D contract definition in this fiscal year, we will be able to decide which elements should be used on both systems. This will allow us to initiate ASMS contract definitions by late fiscal year 1968.

The funds requested for the advanced point defense surface missile system (advanced PDSMS) program will support the development of a replacement for the basic point defense system (modified Sparrow III) now being deployed. This development is being closely coordinated with the Army's advanced forward area air defense system (AFAADS) program to maximize the common use of technology and components. The funds requested will support contract definition of the advanced PDSMS in fiscal year 1968.

The funds requested for "advanced ARM technology" will support preliminary development work on advanced antiradiation missiles.

The funds requested for the "Landing force support weapon (LFSW)" will complete feasibility testing of the Army Lance missile adapted to a sea-borne role for support of amphibious assault operations.

The "augmented thrust propulsion" program, for which funds are requested in fiscal year 1968, seeks to advance propulsion technologies for both strategic and tactical missiles in order to increase payload and/or range.

Grouped under "Astronautics" are several Navy programs, which I described earlier, relating to satellite communications and the potential use of navigation satellites by the tactical forces. We are requesting a total of \$6 million for these programs in fiscal year 1968.

The next group of items under Navy advanced developments are concerned with antisubmarine warfare (ASW) and the deep submergence program. The fiscal year 1968 budget includes a total of \$356 million for ASW R.D.T. & E., \$126 million in advanced developments.

The first item, "Advanced undersea surveillance", includes three ASW surveillance projects.

The next two items involve the development of new sonars. The first, the "Advanced submarine sonar" program, consists of three efforts: a new submarine sonar, investigations in submarine acoustic communications, and the testing of a sonar for deep-diving auxiliary submarines. The advanced surface sonar program provides for the development of a passive/active sonar to detect, localize, classify, and track submarines (PAD LOC).

The next item, \$42 million for the "Deep submergence program", is one of the more important efforts in terms of its potential impact on future Navy programs. This program consists of three separate but closely interrelated projects: the deep submergence system

project (DSSP), deep research vehicles (DRV), and deep ocean technology (DOT).

No further funding is requested for the "combined gas turbine propulsion" program, pending further study of the results achieved to date.

The "active PLANAR array sonar" is concerned with the development of an experimental integrated ship sonar system.

The "ASW/ship integrated combat system" consists of two efforts: ASW command and control, and ASW integrated combat system (ICS).

The next item, \$13 million for "Reactor propulsion plants," will consist of three concurrent efforts in fiscal year 1968: the development of a "natural circulation" powerplant, a small combatant ship reactor, and a more powerful reactor for use in aircraft carriers.

The "advanced surface craft" consists of advanced development projects for three different types of surface ships, for which a total of \$10 million is requested in fiscal year 1968. The first effort, "surface effect craft" (e.g., air cushion vehicles and captured air bubble ships), is to acquire the technology and design capability needed to build large high-speed "surface effects" ships. In the second effort, "hydrofoil craft", we have built a 110-ton, 45-knot patrol craft (PCH) and have a 300-ton, 50-knot hydrofoil auxiliary ship (AGEH) over 90 percent complete. The third effort, "landing craft", is concerned with the development and test of high speed amphibious and assault landing craft concepts.

Air Force

The first five items on the Air Force list of advanced developments are all part of the V/STOL technology program which was discussed earlier.

Last year, we programed \$3 million for fiscal year 1967 to support preliminary work on a new "V/STOL assault transport." We have reconsidered the requirement for this type of aircraft and decided that it is premature to settle now on a specific design. Therefore, the project has been renamed "Light Intertheater Transport" and will be concerned with the development of a new aircraft to replace eventually the CV-2 (Caribou) and similar small transports. The \$2 million requested in fiscal year 1968 will be used for preliminary study of possible designs including V/STOL aircraft.

The fiscal year 1967 funds for "V/STOL aircraft technology" will, as previously described, support contract definition of a new V/STOL fighter aircraft, a project jointly financed with the Federal Republic of Germany.

No further funding is required for the next item, "Lightweight turbojet," which was principally concerned with demonstrating light turbine engines for V/STOL aircraft.

The \$3 million requested for "Tri-service V/STOL" development will continue operational testing of the XC-142A aircraft, as I noted earlier.

The next item, \$20 million for "V/STOL engine development," will provide for the continued work on two engines, a direct-lift engine and a lift/cruise engine or for forward propulsion. . . .

The next two items, "Overland radar" and "AWACS," were mentioned previously in connection with their potential application to

future continental defense against bomber attack. The funds requested for the "Overland radar" program in fiscal year 1968 will support continued flight testing of radar techniques for detecting and tracking airborne targets over land in the presence of severe ground clutter and provide for development of components for still more advanced radars for future generation air early warning systems. No additional funding is requested for AWACS in fiscal year 1968 inasmuch as the radar evaluation is not yet far enough along to warrant going forward with contract definition during fiscal year 1968. However, funds will be available to support continued concept formulation of the "AWACS" system and contract definition if progress on the program indicates this as the logical next step.

The next item, "Advanced avionics," is concerned with improving the night and bad weather attack capabilities of tactical aircraft. Work will be conducted on visual sensors, weapons delivery subsystems, navigation equipment (doppler, inertial, loran), and an integrated radome-radar for reconnaissance fighters.

The funds requested for "Penetration aids for tactical fighters" will support continued work on devices and techniques for existing tactical aircraft to enable them to operate successfully in hostile radar-controlled gun and surface-to-air missile environments.

The funds requested for "Tactical air-to-ground missile (Maverick)" would support contract definition and initiation of engineering development in fiscal year 1968 of a new TV-guided air-to-surface missile.

For "Conventional weapons" development, \$5 million is requested in fiscal year 1968. These funds will finance a number of projects designed to demonstrate the technical feasibility of advanced conventional munitions and air delivery systems, various carriage and release mechanisms, fuzing technology, etc.

The \$8 million requested for "Flight vehicle subsystems" in fiscal year 1968 will support advanced development effort in two areas vital to future aircraft design. The first project consists of collecting and analyzing air turbulence data with the objective of improving the design of aircraft structures and control equipment. The second project is concerned with demonstrating the ability of current flight control technology to reduce the effects of wind gusts, aircraft maneuvers, etc., particularly in low-level flight, in order to increase structural life and crew efficiency.

The \$8 million for "Advanced ASM technology" will support a program designed to provide a technical foundation for new and improved tactical air-to-surface missile guidance systems. The largest single project involves a new approach to the all-weather guidance problem.

The \$3 million requested for the "X-15 research aircraft" program will complete in fiscal year 1968 all of the Defense Department sponsored experiments now planned. Subsequently, NASA will assume full responsibility for funding the X-15 test program.

The next item, "AMSA" will require \$26 million in fiscal year 1968. (The \$11.8 million added by the Congress for fiscal year 1967 will be applied to the fiscal year 1968 program). In fiscal year 1968, we plan to carry on development of an engine that could be used in this and other advanced aircraft. Additional funds will be required for

system integration of the avionics and to allow the airframe contractors to accommodate their designs to the engine developments.

The \$8 million requested for "Advanced filaments and composites" will support further work in developing new high strength, lightweight materials for use in aerospace structural and propulsion systems.

The next item, "Advanced ICBM technology," has now been reoriented from a "general" technology effort to the specific support of projects most likely to aid in the selection of subsystems for the possible new ICBM discussed earlier.

No additional funding in fiscal year 1968 is requested for the next item, "Stellar inertial guidance." The Pace II, a highly precise inertial navigator developed with prior year funds, is now in its evaluation phase which is expected to extend into fiscal year 1968. After review of these test results, future followup efforts will be determined.

A number of the other Air Force advanced development items are space projects which I discussed earlier.

ENGINEERING DEVELOPMENT

This category includes those projects being engineered for service use, but which have not yet been approved for production and deployment.

Army

A total of \$422 million has been included in the fiscal year 1968 budget to continue development of the Nike-X on a high priority basis, as discussed in Strategic Forces section of this statement.

One of the Army's major research and development program objectives is to have a number of ground force weapon systems in various stages of development at all times. The next item, "Firepower other than missiles," for which \$49 million is requested, constitutes the bulk of the Army's effort in this area and is divided into three main categories: "Individual and supporting weapons"; "field artillery weapons, munitions and equipment"; and "nuclear munitions."

The largest project in the first category is the medium antitank weapon (MAAW), a shoulder-fired 14.5-pound missile (28 pounds including launcher) with a shaped charge warhead. Other projects in the individual and supporting weapons category include a series of new ordnance signaling devices which are being engineered in response to southeast Asia requirements and a new vehicle rapid fire weapon system, to replace the cal. 50 machine gun and the interim HS-820 20 mm. cannon.

The "Field artillery weapons, munitions, and equipment" category encompasses the development of sophisticated conventional munitions and the resolution of ammunition problems associated with southeast Asia.

The "Nuclear munitions" category covers the development of Army supplied components for nuclear projectiles and atomic demolition munitions. Present efforts are being directed toward an advanced firing device for demolition munitions, and fuzes and cases for an improved 155 mm. artillery round.

The "Aircraft suppressive fire support system" project, for which \$14 million is requested in fiscal year 1968 is concerned with the development and adaptation of weapon subsystem for Army aircraft.

"Other airmobility projects," for which \$6 million is requested, includes work on aircraft engines, lightweight aircraft armor, and aerial delivery equipment.

The next item, \$9 million for "Surface mobility," comprises three efforts: "wheeled vehicles," "tracked special vehicles," and "marine craft." The major project in the first category will be the initiation of engineering development for the new 1½-ton XM-705 truck as an ultimate replacement for the current M-37 truck in rear areas. The major project in the second category will be a new armored reconnaissance vehicle capable of operations in adverse terrain and the "mechanized infantry combat vehicle-70," a replacement for the current personnel carrier. The third category includes work on shallow draft boats, a beach discharge lighter, etc.

The \$14 million for "Combat surveillance and target acquisition" provides for a number of projects. The largest is the TACFIRE system in which automatic data processing and display techniques will be used to improve the accuracy, response time and overall effectiveness of field artillery firepower. Contract definition will begin this year, with initiation of engineering development scheduled to take place next fall. Other projects include: improved sensors for the detection and location of enemy personnel, vehicles and weapons on the battlefield; airborne sensors for visual target location; a forward-looking infrared set for helicopters; image interpretation and photo processing equipment, etc.

The \$21 million for "Communications and electronics" provides for a broad based program to improve the Army's communication, avionics and electronic warfare equipment.

Navy

The first item on the Navy's list of engineering developments is the "Medium range air-to-surface missile (Condor)".

The funds requested for the "Advanced Sparrow" will substantially complete this development.

The next item, "Three-T systems improvements," consists of the engineering work necessary to support the updating of the three-T missiles (Tartar, Terrier, Talos) through the development of replacement components designed to increase the performance of these systems. The \$7 million requested for fiscal year 1968 will support development of improved components for the Talos system's radar.

The \$8 million requested for "Unguided/conventional air launched weapons" will support engineering development of a number of munitions projects: Snakeye II, a second generation retarded bomb; Fireye, an improved fire bomb using new napalm mixes and improved igniters; a hypervelocity tactical aerial rocket; an improved 20 mm. general purpose projectile, etc.

The next item for which we are requesting funds in fiscal year 1968, "Multimission tactical fighter (VFAX)," is for concept formulation of an advanced fighter aircraft. Since both the Navy and the Air Force may require such a fighter, we are examining the feasibility of a joint development program. Both services would use a power plant employing the lift/cruise engine technology.

The next five items on the list are all related to undersea warfare (USW), and total \$76 million for fiscal year 1968.

The largest single dollar item in fiscal year 1968 will be the "ASW aircraft development (VSX)". The funding level proposed will support continued concept formulation and development of long leadtime components of this system in fiscal year 1968.

The next item, the "MK-48 Torpedo," is designed for use by both submarines and surface ships. The MK-48 is already under contract.

The funds requested for the "Directional Jezebel" will complete the development funding of a sonobuoy capable of providing the bearing of a target directly to ASW aircraft.

The "Other undersea warfare projects" for which \$19 million is requested, include, for example, a shipboard periscope detection radar, the development of antenna systems integrated into the submarine's superstructure, etc.

The "Carrier based airborne tactical control system (CBATCS)" is designed to provide a major performance improvement over the present system now carried by the E-2A.

The \$14 million requested for "Marine Corps developments", will support a number of projects on electronic systems, weapons and vehicles for the Marine Corps. Included in this program are the Marine Corps' portion of joint-service research projects such as the medium and heavy assault antitank weapons (MAAW and TOW), which were mentioned earlier in connection with the Army's research and development program. Another project is the development of a new landing force assault amphibian vehicle, with equally good heavy surf capabilities but better land performance than present vehicles. In the area of electronics, the overall objective is more reliable and lighter-weight equipment, e.g., a new lightweight battlefield mortar locator being developed jointly with the Army. Other projects include an automated system for integrating air support activities into the Marine Corps tactical data system; improved nuclear, biological and chemical hazard detection equipment; and a semiautomatic electronic switching facility for use by tactical units in southeast Asia-type environments—all of which are being developed jointly with one or more other services.

Air Force

Many of the Air Force's engineering developments have already been discussed in connection with other programs.

The XB-70 test program has been continued following the accident last June, using the one remaining aircraft. We believe that all of the truly important objectives of this test program can be accomplished with presently available funds and no further financing is requested for fiscal year 1968.

Development funding for the next item, the "J-58 engine," was completed in the fiscal year 1967 budget.

The \$20 million shown for the next item, "Interceptor/fire control system/missile," will support redesign and engineering work on the AWG-9 fire control system and the AIM-47 folding fin missile, provide funds for the reconfiguration of the YF-12 test aircraft for use as a test bed for these systems, and continue studies on the possible use of the F-111 or F-12 airframes as a basis for the next generation of inter-

ceptor aircraft. (The fire control system and missile system work would be applicable to either.)

The next item, "F-4 improvements," reflects the cost of developing the internal 20-mm. nose gun for the F-4E. This gun is currently undergoing testing and no additional funds are requested for fiscal year 1968.

The \$33 million requested for "Mark II avionics" will substantially complete the funding of this follow-on to the F-111A's current avionics suit. A modified version of the Mark II will be incorporated in the FB-111.

The funds requested for the "Advanced tactical fighter (FX)," will support continued concept formulation studies on a new air superiority aircraft for possible introduction into the force in the mid-1970's.

We are requesting funds for "Advanced ballistic missile reentry systems," which comprises a wide variety of efforts to provide new reentry vehicle technology for our strategic missiles and to improve our defense penetration techniques.

The \$8 million requested for "Nike targets" will provide launch site support at Vandenberg AFB for ABM targets launched into the Kwajalein area, and for certain Air Force modification development work on the target vehicles.

The funds requested for the next item, "Advanced ICBM," would, as mentioned in the discussion of our Strategic Forces, permit initiation of contract definition for a new strategic missile system in fiscal year 1968, if that proves to be desirable.

The funds requested for the "Adverse weather aerial delivery system" will further develop components designed to give airlift aircraft the capability to navigate to, and air drop personnel and materiel at, specific locations in bad weather or at night without external ground based assistance.

The remaining engineering development items on the Air Force list have all been discussed in connection with the Department's space-related projects.

MANAGEMENT AND SUPPORT

Army

The fiscal year 1968 budget includes \$90 million for the support of the White Sands Missile Range. Test programs are conducted at this range for all the services and NASA. Among the specific projects are the Air Force's advanced ballistic reentry system (ABRES), the Navy's new antiradiation missile (based on the standard SAM missile), the Army's Lance, as well as NASA's Aerobee project. A major effort at this facility is the range instrumentation program, now in its third year, which will refine the data collected on the range, improve the data reduction capability, and augment the range communication system.

We are also requesting \$44 million for the Kwajalein Test Site, operated by the Army.

The \$229 million requested for general support covers the costs of all Army research and development installations and activities other than White Sands and Kwajalein.

Navy

The Pacific Missile Range, for which \$68 million is requested in fiscal year 1968, is responsible for range scheduling, communications, weather and meteorological services, and data reduction in support of assigned missile and space launch operations in the Pacific.

The Atlantic Undersea Test Evaluation Center (AUTECE), located in a deep-sea canyon off the Bahamas, will consist of three separate test ranges for weapons, sonars and acoustic systems. The weapons range became operational October 1966; the acoustic and sonar ranges are scheduled for completion during fiscal year 1967 and fiscal year 1970, respectively. For AUTECE, \$18 million is requested in fiscal year 1968.

General support for other Navy research and development laboratories and test facilities not chargeable to specific programs will require \$310 million in fiscal year 1968.

Air Force

For the Eastern Test Range, \$219 million is requested in fiscal year 1968, approximately \$13 million less than for the current fiscal year. Future test activities will involve greater accuracies, larger payloads, and more complex reentry vehicles as well as more sophisticated missions. To meet these more demanding requirements, the funds included in the fiscal year 1968 request will provide a capability for collecting improved trajectory evaluation data on new frequencies. The program will also provide for the operation of eight specially instrumented C-135 aircraft to support the activities associated with the Apollo programs.

About \$89 million is requested for fiscal year 1968 to support the Air Force Western Test Range which consists of a complex of range-instrumentation networks supporting Air Force, Navy, and NASA launches from Vandenberg AFB, Point Arguello, and Point Mugu. The program also provides for the operation of five Apollo support ships.

General support, including "Development support," will require \$65 million in fiscal year 1968. This item carries the major support of the Air Force Systems Command and its nationwide complex of research, development, and test installations, the construction of additional research and development facilities, and other support programs. It includes about \$85 million for the cost of services provided under contract by organizations such as Rand Aerospace Corp., and the Lincoln Laboratory.

EMERGENCY FUND

For the Department of Defense emergency fund, we are requesting the appropriation of \$125 million and transfer authority of \$150 million, the same as the amounts provided for fiscal year 1967.

FINANCIAL SUMMARY

The research and development program, including the development of systems approved for deployment will require about \$8 billion in

new obligational authority for fiscal year 1968. A comparison with prior years is shown below:

[Billions of dollars]

	1962 actual	1963 actual	1964 actual	1965 actual	1966 actual	1967 esti- mated	1968 pro- posed
R. & D.—except systems approved for de- ployment.....	4.4	5.2	5.4	5.1	5.3	5.4	5.8
R. & D.—systems approved for deployment.....	2.5	2.5	2.3	1.9	2.2	2.3	2.4
Total R. & D.....	6.9	7.7	7.7	7.0	7.5	7.7	8.2
Less support from other appropriations.....	-6	-6	-6	-5	-6	-5	-7
Total R.D.T. & E. (TOA).....	6.3	7.1	7.1	6.5	6.9	7.2	7.5
Less financing adjustment.....	-9	-1	-1		-2		-2
Total R.D.T. & E. (NOA).....	5.4	7.0	7.0	6.5	6.7	7.2	7.3

OTHER MAJOR PROGRAMS

In last year's reorganization of the 5-year defense program structure, we established four new major programs which, for purposes of this presentation, have been grouped together in this section.

SPECIALIZED ACTIVITIES

Specialized activities comprise those elements of the Defense program which are directly related to the missions of the combat forces in the Strategic, General Purpose, and Airlift/Sealift Forces programs, but which for purposes of management are more logically handled within the context of homogeneous functional groupings of similar or complementary activities.

National military command system

The National Military Command System (NMCS) is the primary subsystem of the Worldwide Military Command and Control System.

The NMCS comprises the National Military Command Center (NMCC) at the Pentagon, the Alternate National Military Command Center (ANMCC), the National Emergency Command Post Afloat (NECPA), the National Emergency Airborne Command Post (NEACP), and the various communications networks linking these command facilities, the unified and specified commands and service headquarters.

As part of our continuing effort to improve the NMCS, we have expanded the automatic data processing capability at the NMCC to handle the increased workload related to southeast Asia operations and to provide support for the newly created strategic mobility staff in the Office of the Joint Chiefs of Staff. The fiscal year 1968 budget request provides funds for the further improvement of the data processing system, the information displays, and the related facilities and equipment.

Communications

The communications category includes both the Defense Communications System (DCS) and certain non-DCS communications operated by the military departments.

Other specialized activities

The specialized activities program also includes the overseas administration and grant aid portions of the military assistance program, and such other mission-related activities as weather service, oceanography, aerospace rescue and recovery, etc.

Because the military assistance program is not included in the legislation being considered at this time, only the last category of activities will be discussed here.

Weather Service. The Air Force and Naval Weather Services collect, analyze, predict, and disseminate, globally, meteorological and geophysical information for the support of military operations, NASA's space program (including manned space vehicle reentries and recoveries), research and development missile test firings, and they conduct hurricane and typhoon tracking and forecasting, and collect nuclear debris air samples for the AEC in connection with the test ban treaty safeguards.

Oceanography. This category comprises the activities of the Navy's Oceanographic Office, Defense support of the National Oceanographic Data Center and their related research aircraft and survey ships. During the coming fiscal year, the Navy will significantly expand its oceanographic effort. For example, in the "broad ocean survey" program the range of data collected will be greatly increased.

At the end of fiscal year 1966, nine oceanographic research and survey ships (three manned by Navy crews and six operated by MSTs) and two environmental production research aircraft were employed in the program. Seven of these are converted World War II ships but the other two are new oceanographic survey ships (AGS's) which entered the force during fiscal year 1966. In fiscal year 1967 two more new ships—oceanographic research vessels (AGOR's)—will be commissioned, increasing the force to 11 ships and making possible an expansion of the program. The AGS funded in fiscal year 1967 should enter service in fiscal year 1969. No new ships are being requested in fiscal year 1968 for this "operational" program, although two oceanographic research ships are included in the budget for the research and development program with which this survey effort is closely integrated.

Air rescue and recovery. The air rescue and recovery program comprises the Air Force Aerospace Rescue and Recovery Service (ARRS), certain specialized forces of the Navy, and certain assigned forces of the Army and Marine Corps.

To provide increased aircrew recovery capability in southeast Asia, additional ARRS helicopters will be procured in fiscal year 1967 and fiscal year 1968.

Traffic control, approach, and landing system. The Traffic control approach and landing system (TRACALS) element encompasses those "common system" air traffic control facilities not provided by the Federal Aviation Agency.

There are two prominent current programs. The first, the AIMS program, is concerned with the addition of the air traffic control radar beacon system, which provides positive identification and location of aircraft to all air traffic control radar facilities. The second is concerned with the replacement of current VHF and UHF air-ground-air communications systems in order to meet the more stringent requirement of 50 kilocycle spacing between channels in

accordance with our agreements with other members of the International Civil Aviation Organization.

Nuclear weapons operations. This element covers the activities of the Defense Atomic Support Agency (DASA) which provides specialized staff assistance to the Secretary of Defense and the Joint Chiefs of Staff; operational, logistical and training support for the military services; liaison with the Atomic Energy Commission on weapons development and the planning and conduct of weapons effects tests; and management for the national atomic weapons stockpile. The nuclear weapons effects tests, themselves, as well as nuclear weapons research, are included in the research and development program and were discussed earlier. DASA's construction program for fiscal year 1968 includes further shoreline protection work at Johnston Island.

LOGISTIC SUPPORT

Logistic support comprises a wide variety of activities which cannot be readily allocated to other major programs or program elements. Included under this heading are the costs of moving passengers and carriers, the Military Sea Transportation Service, the Military Airlift Command and contract airlift; purchasing, storing, and inspecting materiel; those parts of the industrial preparedness program (e.g., the provision of new industrial facilities and the maintenance of reserve facilities and equipment) not identified with elements of other major programs; and the major overhaul and rebuild activities for items which are returned to a common stock and cannot, therefore, be related directly to specific military forces of weapon systems.

PERSONNEL SUPPORT

The personnel support program comprises the training, medical and other activities associated with personnel, except for those portions of such activities which are integral elements of another program.

Training

The Defense Department's training establishment constitutes a vast and varied system, including at least 83 major military installations, designed to meet not only peacetime needs for militarily trained manpower, but also to provide the potential for rapidly expanding this force in periods of mobilization. Our total capital investment in these facilities exceeds \$4.8 billion and annual operating costs run over \$1.5 billion. On the average, nearly one-fifth of the active force is assigned to these centers at all times, either as part of the permanent training staff or as trainees. The rising cost of training in the fiscal years 1966-68 period directly reflects the rapid buildup in the size of the military establishment.

Recruit training. Recruit training (i.e., "basic" or "boot camp" training) is given every new enlisted serviceman to facilitate the transition from civilian life, to inculcate necessary standards of conduct and discipline, to provide initial weapons training, to ensure adequate physical conditioning and to foster motivation and service esprit. In total, recruit training loads are expected to decline slightly in fiscal year 1968, following the rapid rise in fiscal years 1966-67. We now estimate that about 920,000 men will enter basic training

next year compared to about 995,000 now estimated for fiscal year 1967.

The fiscal year 1968 request includes funds for two major expansions of basic training facilities. The Air Force plans to add 5,400 additional barracks spaces at its Lackland Military Training Center in Texas and about \$17 million will be needed for this purpose in fiscal year 1968. Construction of a third Navy Recruit Training Center on the site of the former Orlando AFB in Florida (which was previously transferred to the Navy for use as a training devices center in 1964) was initially funded in the fiscal year 1967 budget and \$21 million more is requested in fiscal year 1968.

Technical training. The military services train enlisted personnel for about 1,500 separately identifiable occupational specialties.

Professional training. Professional training encompasses primarily postgraduate level education in military and civilian schools, including medical training.

Among the military schools are the several service command and staff colleges, the service war colleges and the joint service colleges. Each year, over 4,000 students, including foreign military officers and U.S. Government civilians, are educated at these institutions.

Flight training. Flight training is the most expensive type of instruction given by the Defense Department, in large part because of the very heavy investments required in trainer aircraft and facilities. Three factors have now combined to compound our flight training problem: the large numbers of World War II trained pilots who are now coming to the close of their flying careers; the rotation requirements of the Vietnam conflict; and the rapidly increasing size of the Army's aviation program. To meet these increased pilot requirements, the fiscal year 1968 budget includes funds to increase the number of pilots being trained by the services to an annual rate of approximately 13,500. Actual pilot production will not reach the higher authorized levels in fiscal year 1968, however, since it takes up to 18 months to train a pilot.

In the Air Force, the planned annual output of pilots has been increased to 3,492 compared with 2,956 in fiscal year 1967 (including jet pilots trained for the military assistance program). To help handle this increased training load, a ninth undergraduate pilot training operation will be opened at Randolph AFB:

The new planned Navy annual pilot production rate is about 2,525 pilots (including 100 for the military assistance program and U.S. Coast Guard), compared with about 2,200 previously in fiscal year 1967. Of the 2,425 earmarked for the Navy and Marine Corps, about 945 will be trained for jet aircraft, 830 for propeller aircraft and 650 for helicopters.

The Army's planned pilot production has been increased to 7,500 pilots per year (including 180 for the military assistance program), compared with about 3,700 in the original fiscal year 1967 budget. About 90 percent of the new Army pilots will be trained for helicopters, up from about 50 percent in fiscal year 1966. The Army will commission about 75 percent of its new pilots as warrant officers since their positions do not involve command responsibilities. To help handle the larger training loads in fiscal year 1968, Hunter AFB in Georgia (which was scheduled to close in July 1967) has been assigned to the

Army and the present flight training program at Fort Wolters will be expanded.

To support the larger flight training programs, the revised fiscal year 1967 budget and fiscal year 1968 budget requests provide 582 trainer aircraft for the Army, 269 for the Navy, and 458 for the Air Force.

Service Academies. As you know, we have been increasing the level of enrollment at the Military Academy over the past few years toward an ultimate goal of over 4,000. In fiscal year 1968, enrollment will average about 3,300 cadets. To help accommodate the larger student body, the fiscal year 1968 budget includes funds for a new 66-classroom academic building at West Point and for personnel facilities and utilities.

Enrollment at the Naval Academy (currently the largest of the three service Academies) in fiscal year 1968 will remain constant at about 4,100. Construction funds, totaling \$3 million, are requested for the modernization of an academic building at Annapolis, and for additional personnel facilities.

The Air Force Academy, which has also been gradually building up the size of its student body to an ultimate level of 4,000, will reach a total of 3,100 cadets in fiscal year 1968. In addition, a cadet pilot indoctrination program, designed to encourage all physically qualified cadets to consider flight training upon graduation, will be instituted. About \$5 million is included in the fiscal year 1968 budget for construction of medical, training, and other facilities at the Air Force Academy in fiscal year 1968.

Medical services

Medical services include those costs for medical and dental services not directly associated with military units in our other major programs, the costs of medical care for military dependents at non-military facilities, the costs of providing veterinary services, and the cost of operating various health service activities such as the Armed Forces Institute of Pathology.

The fiscal year 1968 construction program for medical facilities totals \$161 million—the largest ever. It includes 27 new hospitals or additions to existing hospitals, together with a large number of other medical facilities.

TABLE 1.—*Department of Defense: Budget summary*

(In millions of dollars)

	Fiscal year 1966	Fiscal year 1967			Fiscal year 1968
		Basic	Supplementals	Total	
Total obligation authority:					
Military personnel.....	17,047	18,731	1,704	20,435	22,025
Operation and maintenance.....	15,378	15,712	3,562	19,274	19,154
Subtotal, operating.....	32,426	34,443	5,266	39,709	41,179
Procurement.....	22,595	18,080	6,306	24,386	24,013
Research, development, test and evaluation.....	6,946	7,042	135	7,177	7,523
Military construction.....	2,545	533	624	1,158	2,144
Family housing.....	682	519	11	530	823
Civil defense.....	105	102	-----	102	111
Special foreign currency program.....	-----	7	-----	7	16
Total, military functions.....	65,299	60,727	12,342	73,069	75,808
Military assistance.....	1,163	888	-----	888	621
Total, TOA.....	66,462	61,614	12,342	73,956	76,429
Less financing adjustments.....	-2,929	-1,676	-----	-1,676	-1,400
Plus NOA for revolving funds.....	-----	-----	535	535	241
New obligation authority.....	63,533	59,939	12,877	72,816	75,270
Expenditures.....	55,377	58,300	9,650	67,950	73,100

TABLE 2.—*Department of Defense: Summary of the fiscal year 1967 supplementals*

(In millions of dollars)

SOUTHEAST ASIA

Military personnel.....	1,364
Operations and maintenance.....	3,311
Subtotal, operating.....	4,675
Procurement:	
Ammunition.....	677
Aircraft:	
Combat attrition.....	1,525
Training and other.....	439
Spares.....	996
Other aircraft equipment.....	775
Total aircraft.....	3,715
Vehicles.....	506
Electronics and communications.....	581
All other procurement.....	840
Total change in procurement program.....	6,317
Financing adjustments.....	-11
NOA for procurement.....	6,306
Research and development for limited war.....	135
Construction for southeast Asia.....	624
Increase in stock funds.....	535
Subtotal, SEA.....	12,276
OTHER	
Pay increase already voted:	
Military.....	340
Civilian.....	179
Medicare and homeowners assistance, already voted.....	82
Subtotal, amounts already voted.....	601
Total new obligational authority requested.....	12,877

TABLE 3.—Department of Defense: Financial summary

[Dollar amounts in billions]

	1961	1962 original	1962 final	1963	1964	1965	1966	1967			1968
								Enacted or author- ized 1	SEA supple- ment	Total	
Strategic forces			\$11.2	\$10.5	\$9.3	\$7.1	\$6.8	\$6.7	\$0.4	\$7.1	\$8.1
General purpose forces.....			18.0	17.9	18.0	19.1	29.5	20.8	7.5	34.3	34.4
Specialized activities.....			3.0	3.7	3.9	4.2	4.7	4.7	.2	4.9	5.3
Airlift and sealift forces.....			1.1	1.1	1.2	1.4	1.7	1.1	.4	1.5	1.6
Reserve and guard forces.....			1.8	1.7	1.9	2.0	2.3	2.4	.2	2.6	2.8
Research and development.....			4.4	5.2	5.4	5.1	5.3	5.3	.1	5.4	5.8
Logistics.....			3.8	3.7	3.8	4.0	5.3	5.0	1.3	6.3	6.0
Personnel support.....			4.8	5.0	5.3	5.7	7.2	7.1	1.1	8.2	8.9
Administration.....			1.2	1.3	1.3	1.5	2.6	2.3	.7	3.0	3.1
Military assistance program.....			1.8	1.6	1.2	1.3	1.2	.9	.....	.9	.6
Gross total obligational authority.....			51.1	51.7	51.5	51.4	66.6	62.4	11.8	74.2	76.6
Less unfunded retirement pay.....			-.5	-.3	-.3	-.2	-.1	-.2	-.1	-.3	-.2
Net total obligational authority.....	\$46.1	\$44.9	50.6	51.3	51.2	51.2	66.5	62.2	11.7	74.0	76.4
Working capital.....	-.4	-.2	-.4	-.4	-.3	-.2	.....	.....	.5	.5	.2
Other financing adjustments.....	-2.6	-1.0	-.8	.2	.....	-.5	-2.9	-1.7	.....	-1.7	-1.4
New obligational authority.....	43.1	43.7	49.4	51.1	50.9	50.5	63.5	60.5	12.3	72.8	75.3
Total expenditures.....	44.7	44.7	48.2	50.0	51.2	47.4	55.4	58.9	9.1	68.0	73.1
Expenditures as percent of GNP.....	8.8	.....	8.9	8.7	8.4	7.3	7.8	.....	.....	8.9	9.0
TOA by department and agency:											
Army.....			\$12.9	\$12.2	\$12.8	\$12.7	\$19.1	\$13.5	\$5.1	\$23.6	\$24.7
Civil Defense.....			.3	.1	.1	.1	.1	.1	.....	.1	.1
Navy.....			15.1	15.1	14.9	15.3	20.0	18.5	3.5	22.0	22.4
Air Force.....			20.2	21.0	20.6	20.1	24.3	22.5	3.0	25.5	26.0
Defense agencies.....			.3	.9	1.1	1.1	1.3	1.4	.1	1.5	2.0
Defense family housing 2.....			.5	.6	.7	.7	.7	.5	.....	.5	.8
Military assistance program.....			1.8	1.6	1.2	1.3	1.2	.9	.....	.9	.6
Gross total obligational authority 2.....			51.1	51.7	51.5	51.4	66.6	62.4	11.8	74.2	76.6

Memo: Increase in pay included above:											
Military				.1	1.1	1.6	2.4	3.4		3.4	3.6
Civilian				.2	.3	.6	.7	1.0		1.0	1.1
Increased payments to retired personnel			.1	.2	.4	.6	.8	1.0		1.0	1.2
Total			.1	.5	1.8	2.8	4.0	5.4		5.4	5.9
Memo: Unfunded military retirement past service liability	\$45.1	\$47.3	47.3	48.9	56.1	59.5	66.6	71.4		71.4	74.1

¹ Included is supplemental appropriation request for military and civilian pay increases authorized by Public Law 89-501 and Public Law 89-504; medicare authorized by Public Law 89-614; and Homeowners Assistance program authorized by Public Law 89-754.

² In 1961 and 1962, funds for this activity were appropriated to the military departments.

³ Excludes cost of nuclear warheads.

TABLE 4.—Department of Defense: Direct budget plan (TOA), new obligational authority, and expenditures, fiscal years 1966-68

[In millions of dollars]

	Direct budget plan (TOA)			New obligational authority			Expenditures		
	Fiscal year 1966	Fiscal year 1967	Fiscal year 1968	Fiscal year 1966	Fiscal year 1967	Fiscal year 1968	Fiscal year 1966	Fiscal year 1967	Fiscal year 1968
FUNCTIONAL CLASSIFICATION									
Military personnel:									
Active Forces.....	14,652	17,636	¹ 19,055	14,655	17,636	¹ 19,055	14,407	17,465	¹ 18,903
Reserve Forces.....	803	985	950	818	985	950	755	935	910
Retired pay.....	1,592	1,814	2,020	1,600	1,814	2,020	1,591	1,800	2,010
Total.....	17,047	20,435	¹ 22,025	17,073	20,435	¹ 22,025	16,753	20,200	¹ 21,823
Operation and maintenance.....	15,378	19,274	¹ 19,154	15,339	19,274	¹ 19,154	14,710	18,600	¹ 19,017
Subtotal, operating.....	32,426	39,709	41,179	32,412	39,709	41,179	31,463	38,800	40,840
Procurement.....	22,595	24,386	24,013	20,013	22,886	22,917	14,339	18,465	21,632
Research, development, test, and evaluation.....	6,946	7,177	7,523	6,746	7,181	7,273	6,259	6,700	7,200
Military construction.....	2,545	1,158	2,144	2,566	1,097	2,123	1,334	1,600	1,600
Family housing.....	682	630	823	666	518	814	647	570	582
Civil defense.....	105	102	111	107	101	111	86	97	100
Special foreign currency program.....		7	16		7	16		2	9
Revolving and management funds.....					535	241	281	716	337
Total, military functions.....	65,299	73,609	75,808	62,510	72,034	74,674	54,409	66,950	72,300
Military assistance.....	1,163	888	621	1,023	782	596	968	1,000	800
Total, military functions and military assistance.....	66,462	73,956	76,429	63,533	72,816	¹ 75,270	55,377	67,950	73,100

DEPARTMENT OR AGENCY									
Department of the Army.....	18,548	22,920	23,918	17,492	22,989	23,629	14,832	21,108	23,372
Department of the Navy.....	19,462	21,365	21,690	18,486	20,709	21,134	16,026	18,978	20,429
Department of the Air Force.....	23,593	24,803	25,281	22,655	24,263	24,891	20,131	22,594	24,077
Defense Agencies/OSD.....	3,590	3,879	4,767	3,770	3,972	4,867	3,335	4,174	4,282
Civil Defense.....	105	102	111	107	101	111	86	97	100
Total, military functions.....	65,299	73,069	75,808	62,510	72,034	74,674	54,409	66,950	72,300
Military assistance.....	1,163	888	621	1,023	782	596	968	1,000	800
Total, military functions and military assistance.....	66,462	73,956	76,429	63,533	72,816	75,270	55,377	67,950	73,100

¹ Fiscal year 1968 includes amounts proposed for separate transmittal under proposed legislation not distributed by military department, as follows:

[Millions of dollars]

	TOA	NOA	Expenditures
Military personnel.....	24	24	23
Operation and maintenance.....	18	18	17
Total.....	42	42	40

NOTE.—Fiscal year 1967 NOA includes amounts proposed for separate transmittal: \$12,275,870,000 for southeast Asia support; \$340,130,000 for military pay increase; \$179,000,000 for civilian pay increase; \$71,000,000 for medicare benefits; and \$11,000,000 for homeowners assistance.

TABLE 5.—Department of Defense—Direct budget plan (TOA), new obligational authority, and expenditures, fiscal year 1966–68 by functional title and service

[In millions of dollars]

Functional classification	Department of Defense, total				Department of the Army				Department of the Navy			
	Fiscal year 1966	Fiscal year 1967 supplemental	Fiscal year 1967 total	Fiscal year 1968	Fiscal year 1966	Fiscal year 1967 supplemental	Fiscal year 1967 total	Fiscal year 1968	Fiscal year 1966	Fiscal year 1967 supplemental	Fiscal year 1967 total	Fiscal year 1968
TOTAL OBLIGATIONAL AUTHORITY (TOA)												
Military personnel:												
Active Forces.....	14,652	1,620	17,636	19,055	5,149	729	6,898	7,870	4,565	381	5,212	5,467
Reserve Forces.....	803	50	955	950	521	45	680	642	145	2	151	154
Retired pay.....	1,592	34	1,814	2,020								
Total.....	17,047	1,704	20,435	22,025	5,670	774	7,577	8,512	4,710	383	5,363	5,621
Operation and maintenance:												
.....	15,378	3,562	19,274	19,154	5,098	2,061	7,448	7,344	4,268	790	5,071	5,101
Subtotal, operating.....	32,426	5,266	39,709	41,179	10,768	2,835	15,025	15,857	8,979	1,173	10,434	10,722
Procurement:												
Aircraft.....	10,007	3,539	10,350	9,111	1,287	533	1,202	769	3,202	1,703	3,463	2,560
Missiles.....	2,020	102	2,199	2,786	364	6	560	769	408	51	354	649
Ships.....	1,876		2,041	1,946					1,876		2,041	1,946
Tracked combat vehicles.....	445	66	527	430	421	62	509	425	23	4	18	5
Ordnance, vehicles and related equipment.....	5,012	1,547	5,521	6,436	2,041	759	2,095	2,836	1,544	328	1,563	1,871
Electronics and communications.....	1,473	403	1,502	1,444	507	303	617	550	473	57	519	560
Other procurement.....	1,782	648	2,244	1,860	570	467	880	533	716	149	780	780
Total.....	22,595	6,306	24,386	24,013	5,190	2,130	5,863	5,881	8,242	2,292	8,738	8,371
Research, development, test, and evaluation:												
Military sciences.....	601		616	615	160		161	165	181		189	192
Aircraft.....	1,258	26	1,171	1,145	101	4	114	116	292	12	335	280
Missiles.....	1,997	15	2,414	2,499	699		722	706	417	15	715	785
Astronautics.....	1,075		954	1,119	23		14	11	23		18	16
Ships.....	325	3	285	299	1		1	1	324	3	285	298
Ordnance, vehicles, and related equipment.....	386		354	313	202		196	184	184		158	130
Other equipment.....	901	91	968	988	262	36	307	309	83	10	110	137
Programwide management and support.....	405		395	421	75		78	79			98	102
Emergency fund.....			18	125								
Total.....	6,946	135	7,177	7,523	1,523	40	1,593	1,571	1,582	40	1,908	1,940

Military construction:												
Active Forces.....	2,519	624	1,131	2,107	1,066	288	430	592	650	140	279	651
Reserve Forces.....	26		26	37			8	17	10		5	5
Total.....	2,545	624	1,158	2,144	1,066	288	438	600	659	140	285	656
Family housing.....	682	11	530	823								
Civil defense.....	105		102	111								
Special foreign currency program.....			7	16								
Total, military functions.....	65,299	12,342	73,069	75,808	18,548	5,293	22,920	23,918	19,462	3,645	21,365	21,690
Military assistance.....	1,163		888	621								
Total, TOA.....	66,462	12,342	73,956	76,429	18,548	5,293	22,920	23,918	19,462	3,645	21,365	21,690
Less financing adjustments.....	-2,929		-1,676	-1,400	-1,056		-282	-349	-976		-733	-559
Plus NOA for revolving funds.....		535	535	241		351	351	60		77	77	4
New obligational authority.....	63,533	12,877	72,816	75,270	17,492	5,644	22,989	23,620	18,486	3,722	20,709	21,134
Expenditures.....	55,377	9,650	67,950	73,100	14,832	4,589	21,108	23,372	16,026	1,923	18,978	20,429

TABLE 5.—Department of Defense—Direct budget plan (TOA), new obligational authority, and expenditures, fiscal year 1966-68 by functional title and service—Continued

[In millions of dollars]

Functional classification	Department of the Air Force				Defense agencies/OSI-Civil Defense			
	Fiscal year 1966	Fiscal year 1967 supplemental	Fiscal year 1967 total	Fiscal year 1968	Fiscal year 1966	Fiscal year 1967 supplemental	Fiscal year 1967 total	Fiscal year 1968
TOTAL OBLIGATIONAL AUTHORITY (TOA)								
Military Personnel:								
Active Forces.....	4,399	510	5,526	5,694				
Reserve Forces.....	137	3	155	153				
Retired pay.....								
					1,592	54	1,814	2,020
Total.....	5,075	413	5,681	5,847	1,592	34	1,814	2,020
Operation and Maintenance.....	5,259	595	5,790	5,679	753	115	965	1,012
Subtotal, operating.....	10,334	1,109	11,471	11,526	2,345	149	1,779	3,032
Procurement:								
Aircraft.....	5,518	1,303	5,685	5,782				
Missiles.....	1,248	45	1,284	1,368				
Ships.....								
Tracked combat vehicles.....								
Ordnance, vehicles, and replacement equipment.....	1,426	460	1,863	1,728	1		1	1
Electronics and communications.....	467	44	361	323	6		5	11
Other procurement.....	446	33	545	511	30		39	37
Total.....	9,125	1,884	9,738	9,712	37		45	48
Research, development, test and evaluation:								
Military sciences.....	157		160	157	103		107	101
Aircraft.....	845	10	711	740	17		12	10
Missiles.....	759		862	890	123		114	118
Astronautics.....	1,025		918	1,089	4		4	3
Ships.....								
Ordnance, vehicles, and related equipment.....								
Other equipment.....	314	23	308	307	343	22	243	234
Programwide management and support.....	241		208	228	4		11	12
Emergency fund.....							18	125
Total.....	3,339	33	3,168	3,410	501	22	508	602
Military construction:								
Active Forces.....	779	196	413	618	24		9	246
Reserve Forces.....	17		13	15				
Total.....	796	196	426	633	24		9	246

Family housing.....					682	11	530	823
Civil defense.....					105		102	111
Special foreign currency program.....							7	16
Total, Military functions.....	23,593	3,222	24,803	25,821	3,695	182	3,981	4,878
Military assistance.....								
Total, TOA.....	23,593	3,222	24,803	25,281	3,695	182	3,981	4,878
Less financing adjustments.....	-939		-540	-434	132		-15	-32
Plus NOA for revolving funds.....				44		107	107	133
New obligational authority.....	22,655	3,222	24,263	24,891	3,877	289	4,073	4,978
Expenditures.....	20,131	2,785	22,594	24,077	3,421	503	4,271	4,382

¹ Fiscal year 1968 TOA includes amounts proposed for separate transmittal under proposed legislation not distributed by military department, as follows:

Military personnel.....	\$24,000,000
Operation and maintenance.....	18,000,000

NOTE.—Fiscal year 1967 TOA includes amounts proposed for separate transmittal: \$11,740,870,000 for southeast Asia support; \$340,130,000 for military pay increase; \$179,000,000 for civilian pay increase; \$71,000,000 for medicare benefits; and \$11,000,000 for homeowners assistance.

TABLE 6.—Department of Defense: Estimated obligations and amounts available for obligation, general fund appropriations, fiscal year 1966-68

[In millions of dollars]

Item	New obligational authority	Reimbursement	Total available for obligation	Obligations	Unobligated balance carried forward	Unobligated balance as percent of available
FISCAL YEAR 1966—ACTUAL						
Department of the Army	17,492	3,211	23,174	21,000	2,156	9.3
Department of the Navy	18,486	1,750	25,381	18,714	6,666	26.2
Department of the Air Force	22,655	1,520	27,432	23,009	4,421	16.1
Defense agencies, OSD	3,770	67	4,114	3,513	573	13.9
Civil defense	107	-----	130	90	39	30.0
Total, military functions	62,510	6,548	80,230	66,325	13,854	17.2
Military assistance	1,023	6	906	895	11	1.2
Total, military functions and military assistance	63,533	6,555	81,136	67,220	13,865	17.0
FISCAL YEAR 1967—ESTIMATED						
Department of the Army	22,638	3,339	28,240	25,901	2,339	8.2
Department of the Navy	20,632	1,584	28,903	23,615	5,288	18.2
Department of the Air Force	24,263	1,527	30,282	25,788	4,494	14.8
Defense agencies, OSD	3,865	77	4,315	3,994	320	7.4
Civil defense	101	-----	142	130	12	8.4
Total, military functions	71,499	6,527	91,881	79,427	12,454	13.5
Military assistance	728	10	743	733	10	1.3
Total, military functions and military assistance	72,227	6,537	92,624	80,160	12,464	13.4
FISCAL YEAR 1968—ESTIMATED						
Department of the Army	23,569	3,246	29,154	26,944	2,210	7.5
Department of the Navy	21,130	1,576	27,995	22,516	5,479	19.5
Department of the Air Force	24,847	1,000	30,341	26,080	4,262	14.0
Defense agencies, OSD	4,734	77	5,132	4,561	571	11.1
Civil defense	111	-----	123	118	5	4.0
Proposed legislation	42	-----	42	42	-----	-----
Total, military functions	74,433	5,900	92,787	80,261	12,526	13.4
Military assistance	536	10	556	546	10	1.7
Total, military functions and military assistance	74,969	5,910	93,343	80,807	12,536	13.4

NOTES

(1) The total available for obligation is the sum of (a) unobligated balances from the prior year (b) new obligational authority, (c) reimbursements, and (d) transfers between appropriations.

(2) In addition to obligations, the unobligated balance carried forward was reduced by \$51 million of expired obligating authority withdrawn.

TABLE 7.—Department of Defense: Estimated expenditures and amounts available for expenditures, fiscal years 1966-68

[Dollar amounts in millions]

Item	New obligational authority	Total available for expenditure	Expenditures	Unexpended balance carried forward	Unexpended balance as percent of available
FISCAL YEAR 1966—ACTUAL					
Department of the Army.....	\$17,492	\$23,781	\$14,832	\$8,941	37.5
Department of the Navy.....	18,486	34,128	16,026	18,074	52.9
Department of the Air Force.....	22,655	32,419	20,131	12,316	37.9
Defense agencies/OSD.....	3,770	5,134	3,335	1,760	34.2
Civil defense.....	107	211	86	119	56.3
Total, military functions.....	62,510	95,673	54,409	41,210	43.0
Military assistance.....	1,023	2,799	968	1,831	65.4
Total, military functions and military assistance.....	63,533	98,472	55,377	43,041	43.7
FISCAL YEAR 1967—ESTIMATED					
Department of the Army.....	22,989	32,037	21,108	10,930	34.1
Department of the Navy.....	20,709	38,884	18,978	19,907	51.1
Department of the Air Force.....	24,263	36,571	22,594	13,977	38.2
Defense agencies OSD.....	3,972	5,532	4,174	1,358	24.5
Civil defense.....	101	220	97	123	55.9
Total, military functions.....	72,034	113,244	66,950	46,294	40.8
Military assistance.....	782	2,613	1,000	1,613	61.7
Total, military functions and military assistance.....	72,816	115,856	67,950	47,906	41.3
FISCAL YEAR 1968—ESTIMATED					
Department of the Army.....	23,629	34,558	23,372	11,186	32.3
Department of the Navy.....	21,134	41,047	20,429	20,618	50.2
Department of the Air Force.....	24,891	38,862	24,077	14,785	38.0
Defense agencies OSD.....	4,867	6,225	4,282	1,943	31.2
Civil defense.....	111	234	100	134	57.2
Proposed legislation.....	42	42	40	2	4.7
Total, military functions.....	74,674	120,968	72,300	48,668	40.2
Military assistance.....	596	2,209	800	1,409	63.7
Total, military functions and military assistance.....	75,270	123,176	73,100	50,076	40.6

NOTES.—(1) The total available for expenditure is the sum of (a) unexpended balances from the prior year, (b) new obligational authority and (c) transfers between appropriations. Transfers, which total \$173,000,000 in fiscal year 1966; \$200,000,000 in fiscal year 1967; and \$6,000,000 in fiscal year 1968 are not shown in detail. (2) In addition to expenditures, the unexpended balance carried forward was reduced in fiscal year 1966 by \$54,000,000 of balances withdrawn.

TABLE 8.—Department of Defense: Order of magnitude data on comparative new obligational authority by functional title, fiscal years 1954-68

[Millions of dollars]

	Fiscal year 1954	Fiscal year 1955	Fiscal year 1956	Fiscal year 1957	Fiscal year 1958	Fiscal year 1959	Fiscal year 1960	Fiscal year 1961	Fiscal year 1962	Fiscal year 1963	Fiscal year 1964	Fiscal year 1965	Fiscal year 1966	Fiscal year 1967	Fiscal year 1968
FUNCTIONAL CLASSIFICATION															
Military personnel:															
Active Forces.....	11,266	10,650	10,526	10,411	10,398	10,709	10,637	10,695	11,545	11,431	12,273	12,699	14,655	17,636	19,055
Reserve Forces.....	315	369	512	613	607	644	674	660	633	672	703	751	818	985	950
Retired Pay.....	387	424	495	515	567	640	715	790	920	1,026	1,228	1,399	1,600	1,814	2,020
Total.....	11,968	11,442	11,534	11,539	11,572	11,983	12,026	12,144	13,098	13,129	14,204	14,849	17,073	20,435	22,025
Operation and maintenance.....	9,462	8,276	8,768	9,734	10,221	10,187	10,317	10,702	11,759	11,496	11,705	12,603	15,339	19,274	19,154
Subtotal, operating.....	21,430	19,718	20,302	21,273	21,793	22,180	22,343	22,846	24,857	24,625	25,909	27,452	32,412	39,709	41,179
Procurement:															
Aircraft.....	5,041	4,922	6,923	6,559	5,945	6,167	5,929	4,908	5,646	5,882	5,640	5,962	9,354	9,529	8,721
Missiles.....	509	234	764	2,135	2,090	3,966	2,030	2,078	3,230	3,969	3,676	2,615	1,642	2,187	2,711
Ships.....	759	1,150	1,274	1,335	1,723	1,943	1,140	2,246	2,967	2,939	2,060	1,905	1,522	1,757	1,824
Tracked combat vehicles.....	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	211	435	429
Ordnance, vehicles, and related equipment.....	2,990	527	405	247	90	545	703	1,034	1,830	1,959	2,028	1,431	4,252	5,154	5,809
Electronics and communications.....	395	327	215	469	549	982	1,179	935	1,375	1,176	1,353	1,039	1,240	1,417	1,368
Other procurement.....	835	260	214	549	586	701	702	425	697	742	889	672	1,568	2,413	2,055
Total.....	10,588	7,420	9,795	11,294	10,983	14,304	11,701	11,716	15,746	16,067	15,645	13,836	20,013	22,886	22,917
Research, development, test, and evaluation.....	2,165	1,708	1,828	2,185	2,345	3,777	5,620	6,033	6,402	6,993	6,984	6,483	6,748	7,181	7,273
Military construction.....	308	882	2,012	1,915	2,085	1,385	1,364	1,061	972	1,204	949	1,049	2,566	1,097	2,123
Family housing.....										590	644	631	666	518	814
Civil defense.....									257	126	112	105	107	101	111
Special foreign currency program.....														7	16
Revolving and management funds.....	100	1,119		75	130	57	30	30	(3)	(3)			(3)	535	241
Subtotal, military functions, new obligational authority.....	34,590	30,847	33,937	36,742	37,337	41,703	41,058	41,686	48,234	50,204	50,243	49,557	62,510	72,034	74,674
Transfers from prior year balances.....		-60	-750	-487	-590	-535	-430	-366	-888	-410	-321	-193			
Total, military functions, new obligational authority.....	34,590	30,787	33,187	36,255	36,747	41,168	40,628	41,321	47,846	49,794	49,922	49,363	62,510	72,034	74,674
Military assistance.....	3,192	1,204	1,016	2,018	1,340	1,515	1,331	1,785	1,577	1,325	1,000	1,130	1,023	732	596
Total, military functions and military assistance.....	37,783	31,991	34,203	38,273	38,087	42,683	41,595	43,106	49,423	51,119	50,992	50,493	63,533	72,816	75,270

DEPARTMENT OR AGENCY																
Department of the Army.....	12,777	7,764	7,354	7,672	7,731	9,381	9,689	9,914	12,141	11,631	12,513	12,003	17,492	22,989	23,629	
Department of the Navy.....	9,612	10,221	9,648	10,220	10,506	11,820	11,270	12,431	14,757	15,286	14,899	14,845	18,486	20,709	21,134	
Department of the Air Force.....	11,411	12,137	15,517	17,697	17,732	18,713	18,496	17,884	19,513	20,179	19,446	19,219	22,655	24,263	24,891	
Defense agencies, OSD.....	791	666	667	666	777	1,255	1,173	1,092	1,178	2,572	2,951	3,192	3,770	3,972	4,867	
Civil defense.....									257	126	112	105	107	101	111	
Total, military functions.....	34,590	30,787	33,187	36,255	36,747	41,168	40,628	41,321	47,846	49,794	49,922	49,363	62,510	72,034	74,674	
Military assistance.....	3,192	1,204	1,016	2,018	1,340	1,515	1,331	1,785	1,577	1,325	1,000	1,130	1,023	782	596	
Total, military functions and military assistance.....	37,783	31,991	34,203	38,273	38,087	42,683	41,959	43,106	49,423	51,119	50,922	50,493	63,533	72,816	75,270	

¹ Fiscal year 1968 includes amounts proposed for separate transmittal under proposed legislation not disturbed by military department, as follows:

	Millions
Military personnel.....	\$24
Operation and maintenance.....	18
Total.....	42

² Amount included in entry for "Ordnance, vehicles, and related equipment."

³ Excludes authority in stock funds (10 U.S.C. 2210(b)) to incur reimbursable obligations in anticipation of reimbursable orders to be received in subsequent years. Such authority is included in the budget document presentation as "New obligational authority."

NOTE.—Amounts include estimated comparability adjustments not supportable by accounting records.

TABLE 9.—Department of Defense—Order of magnitude data on comparative expenditures by functional title, fiscal years 1954–1968

(Millions of dollars)

	Fiscal year 1954	Fiscal year 1955	Fiscal year 1956	Fiscal year 1957	Fiscal year 1958	Fiscal year 1959	Fiscal year 1960	Fiscal year 1961	Fiscal year 1962	Fiscal year 1963	Fiscal year 1964	Fiscal year 1965	Fiscal year 1966	Fiscal year 1967	Fiscal year 1968
FUNCTIONAL CLASSIFICATION															
Military personnel:															
Active Forces.....	10,963	10,643	10,665	10,384	10,441	10,545	10,390	10,651	11,530	11,386	12,312	12,662	14,407	17,465	18,903
Reserve Forces.....	293	341	439	514	608	615	654	648	607	599	674	725	755	935	910
Retired Pay.....	386	419	477	511	562	641	694	786	894	1,015	1,209	1,384	1,591	1,800	2,010
Total.....	11,643	11,403	11,582	11,409	11,611	11,801	11,738	12,085	13,032	13,000	14,195	14,771	16,753	20,200	21,823
Operation and maintenance.....	9,162	7,931	8,400	9,487	9,761	10,378	10,223	10,611	11,594	11,874	11,932	12,349	14,710	18,600	19,017
Subtotal, operating.....	20,805	19,334	19,982	20,896	21,372	22,179	21,961	22,696	24,626	24,874	26,127	27,120	31,463	38,800	40,840
Procurement:															
Aircraft.....	9,030	8,804	7,835	8,647	8,793	7,730	6,272	5,898	6,400	6,309	6,053	5,200	6,635	8,010	9,003
Missiles.....	417	604	1,005	1,855	2,434	3,337	3,027	2,972	3,442	3,817	3,577	2,096	2,069	1,990	2,213
Ships.....	905	944	858	842	1,105	1,491	1,744	1,801	1,906	2,522	2,078	1,713	1,479	1,450	1,575
Tracked combat vehicles.....	(²)	(²)	(²)	(²)	(²)	(²)	(²)	(²)	(²)	(²)	(²)	236	202	265	350
Ordnance, vehicles and related equipment.....	3,334	1,191	1,260	674	365	399	443	675	1,137	1,665	1,597	1,073	1,697	3,935	5,204
Electronics and communications.....	700	441	660	704	663	720	1,093	1,042	1,139	1,427	1,264	897	983	1,129	1,159
Other procurement.....	1,521	854	608	767	723	730	755	706	507	891	782	625	1,273	1,686	2,129
Total.....	15,597	12,838	12,227	13,488	14,083	14,409	13,334	13,095	14,532	16,632	15,351	11,839	14,339	18,465	21,632
Research, development, test, and evaluation.....	2,187	2,261	2,101	2,406	2,504	2,866	4,710	6,131	6,319	6,376	7,021	6,236	6,259	6,700	7,200
Military construction.....	1,744	1,715	2,079	1,968	1,753	1,948	1,626	1,605	1,347	1,144	1,026	1,007	1,334	1,600	1,600
Family housing.....										427	580	619	647	570	582
Civil defense.....	-3	(³)	(³)	-1	(³)	(³)	(³)	(³)	90	203	107	93	86	97	100
Special foreign currency program.....														2	9
Revolving and management funds.....	-219	-611	-684	-323	-643	-179	-416	-300	-99	-1,401	-452	-741	281	716	337
Adjustment to budget basis.....	-145	-6	86												
Total, military functions.....	40,326	35,531	35,792	38,436	39,070	41,223	41,215	43,227	46,815	48,252	49,760	46,173	54,409	66,950	72,300
Military assistance.....	3,629	2,292	2,611	2,352	2,187	2,340	1,609	1,449	1,390	1,721	1,485	1,229	968	1,000	800
Total, military functions and military assistance.....	43,955	37,823	38,403	40,788	41,258	43,563	42,824	44,676	48,205	49,973	51,245	47,401	55,377	67,950	73,100

DEPARTMENT OR AGENCY																	
Department of the Army.....	12,910	8,901	8,703	9,063	9,051	9,467	9,392	10,130	11,427	11,499	12,050	11,600	14,832	21,108	23,372		
Department of the Navy.....	11,290	9,732	9,744	10,397	10,913	11,720	11,642	12,214	13,260	14,005	14,520	13,399	16,026	18,978	20,429		
Department of the Air Force.....	15,666	16,405	16,750	18,361	18,437	19,083	19,065	19,785	20,840	20,642	20,509	18,216	20,131	22,594	24,077		
Defense agencies/OSD.....	464	494	506	615	669	953	1,115	1,098	1,198	1,905	2,574	2,865	3,335	4,174	4,282		
Civil defense.....	-3	(*)	(*)	-1	(*)	(*)	(*)	(*)	90	203	107	93	86	97	100		
Total, military functions.....	40,326	35,531	35,792	38,436	39,070	41,223	41,215	43,227	46,815	48,252	49,760	46,173	54,400	66,950	72,300		
Military assistance.....	3,629	2,292	2,611	2,352	2,187	2,340	1,609	1,449	1,390	1,721	1,485	1,229	968	1,000	800		
Total, military functions and military assistance.....	43,955	37,823	38,403	40,788	41,258	43,563	42,824	44,676	48,205	49,973	51,245	47,401	55,377	67,950	73,100		

¹ Fiscal year 1968 includes amounts proposed for separate transmittal under proposed legislation not distributed by military department, as follows:

Military personnel.....	\$23,000,000
Operation and maintenance.....	17,000,000
Total.....	40,000,000

² Amount included in entry for "Ordnance, vehicles, and related equipment."

³ Less than \$5,000,000.

NOTE.—Amounts include estimated comparability adjustments not supportable by accounting records.

TABLE 10.—*Department of Defense—Financial summary of fiscal year 1967 budget, appropriations enacted and supplementals proposed*

(In thousands of dollars)

	Appropriations enacted	Transfers and adjustments	Military and civilian pay supplemental	"Medicare" and "Home-owners assistance" supplemental	SEA supplemental	Total
Military personnel:						
Military personnel, Army.....	6,164,400	4,164	78,500	-----	650,500	6,897,564
Military personnel, Navy.....	3,652,100	-4,164	77,700	-----	220,800	3,946,436
Military personnel, Marine Corps.....	1,183,200	-----	24,300	-----	58,400	1,265,900
Military personnel, Air Force.....	5,015,800	-----	106,300	-----	403,700	5,525,800
Reserve personnel, Army.....	288,211	-----	6,200	-----	14,900	309,311
Reserve personnel, Navy.....	112,600	-----	800	-----	-----	113,400
Reserve personnel, Marine Corps.....	36,500	-----	800	-----	-----	37,300
Reserve personnel, Air Force.....	69,700	-----	1,100	-----	-----	70,800
National Guard personnel, Army.....	346,533	-----	8,520	-----	15,280	370,333
National Guard personnel, Air Force.....	82,000	-----	1,910	-----	290	84,200
Retired pay, Defense.....	1,780,000	-----	34,000	-----	-----	1,814,000
Total, military personnel.....	18,731,044	-----	340,130	-----	1,363,870	20,435,044
Operation and maintenance:						
Operation and maintenance, Army.....	5,122,427	33,005	64,000	29,000	1,968,000	7,216,432
Operation and maintenance, Navy.....	3,980,300	-24,806	42,000	25,000	624,000	4,646,494
Operation and maintenance, Marine Corps.....	325,600	-45	2,300	-----	96,700	424,552
Operation and maintenance, Air Force.....	4,943,100	-1,823	49,000	17,000	528,000	5,535,277
Operation and maintenance, Defense agencies.....	806,500	2,517	20,300	-----	85,800	915,117
Operation and maintenance, Army National Guard.....	231,000	-----	-----	-----	-----	231,000
Operation and maintenance, Air National Guard.....	253,300	-----	1,400	-----	-----	254,700
National Board for Promotion of Rifle Practice, Army.....	494	-----	-----	-----	-----	494
Claims Defense.....	25,000	-----	-----	-----	9,000	34,000
Contingencies, Defense.....	15,000	-----	-----	-----	-----	15,000
Court of Military Appeals, Defense.....	600	-----	-----	-----	-----	600
Total, operation and maintenance.....	15,703,321	8,844	179,000	71,000	3,311,500	19,273,665
Procurement:						
Procurement of equipment and missiles, Army.....	3,483,300	-----	-----	-----	2,130,000	5,613,300
Procurement of aircraft and missiles, Navy.....	1,789,900	-58,000	-----	-----	1,752,000	3,483,900
Shipbuilding and conversion, Navy.....	1,756,700	-----	-----	-----	-----	1,756,700
Other procurement, Navy.....	1,968,300	-----	-----	-----	287,000	2,255,300
Procurement, Marine Corps.....	262,900	-----	-----	-----	253,000	515,900
Aircraft procurement, Air Force.....	4,017,300	-4,000	-----	-----	1,303,000	5,316,300
Missile procurement, Air Force.....	1,189,500	-----	-----	-----	45,000	1,234,500
Other procurement, Air Force.....	2,122,600	-----	-----	-----	536,000	2,658,600
Procurement, Defense agencies.....	51,300	-----	-----	-----	-----	51,300
Total, procurement.....	16,641,800	-62,000	-----	-----	6,306,000	22,885,800
Research, development, test, and evaluation:						
R.D.T. & E., Army.....	1,528,700	27,998	-----	-----	40,000	1,596,698
R.D.T. & E., Navy.....	1,758,600	115,436	-----	-----	40,000	1,914,036
R.D.T. & E., Air Force.....	3,112,600	23,151	-----	-----	33,000	3,168,751
R.D.T. & E., Defense agencies.....	459,059	1,781	-----	-----	22,000	482,840
Emergency fund, Defense.....	125,000	-106,805	-----	-----	-----	18,195
Total, R.D.T. & E.....	6,983,959	61,561	-----	-----	135,000	7,180,520
Military construction:						
Military construction, Army.....	114,014	-----	-----	-----	288,500	402,514
Military construction, Navy.....	126,918	-----	-----	-----	140,000	266,918
Military construction, Air Force.....	205,495	-----	-----	-----	196,000	401,495
Military construction, Defense agencies.....	7,547	440	-----	-----	-----	7,986
Military construction, Army Reserve.....	-----	-----	-----	-----	-----	-----
Military construction, Naval Reserve.....	5,400	-----	-----	-----	-----	5,400
Military construction, Air Force Reserve.....	-----	-----	-----	-----	-----	-----
Military construction, Army National Guard.....	3,600	-----	-----	-----	-----	3,600

TABLE 10.—Department of Defense—Financial summary of fiscal year 1967 budget, appropriations enacted and supplementals proposed—Continued

[In thousands of dollars]

	Appropriations enacted	Transfers and adjustments	Military and civilian pay supplemental	"Medicare" and "Homeowners assistance" supplemental	SEA supplemental	Total
Military construction—Continued						
Military construction, Air National Guard	9,400					9,400
Loran stations, Defense						
Total, military construction	472,374	440			624,500	1,097,314
Family housing:						
Family housing, Defense	507,196					507,196
Homeowners assistance, Defense				11,000		11,000
Civil defense:						
O. & M., civil defense	66,100	-1				66,099
Research, shelter survey and marking, civil defense	35,000					35,000
Construction of facilities, civil defense						
Total, civil defense	101,100	-1				101,099
Special foreign currency program	7,348					7,348
Revolving funds:						
Army stock fund					351,000	351,000
Navy stock fund					77,000	77,000
Defense stock fund					107,000	107,000
Total, revolving funds					535,000	535,000
Military functions, totals:						
Department of the Army	17,279,079	65,167	157,220	29,000	5,458,180	22,988,646
Department of the Navy	16,959,018	28,418	147,900	25,000	3,548,900	20,709,236
Department of the Air Force	21,024,395	17,328	159,710	17,000	3,044,990	24,263,423
Defense agencies, OSD	3,784,550	-102,069	54,300	11,000	223,800	3,971,581
Civil defense	101,100	-1				101,099
Total, military functions	59,148,142	8,842	519,130	82,000	12,275,870	72,033,984
Military assistance	792,000	-10,425				781,575
Total, new obligatory authority, DOD	59,940,142	-1,583	519,130	82,000	12,275,870	72,815,559
Total expenditures, DOD	58,300,000		505,000	61,000	9,084,000	67,950,000

TABLE 11.—Department of Defense: Net additions to the fiscal year 1967 procurement program for southeast Asia

[Millions of dollars]

	Army	Navy and Marine Corps	Air Force	Total
Ammunition	309	89	279	677
Aircraft:				
Combat attrition	14	1,073	438	1,525
Training and other	258	135	46	439
Spares	149	314	533	996
Other aircraft equipment	169	329	257	755
Total aircraft	590	1,851	1,274	3,715
Vehicles	288	167	51	506
Electronics and communications	338	102	141	581
Other	607	131	110	1,840
Total changes in program (TOA)	2,130	2,340	1,855	1,6,317
Financing adjustments		-48	+29	1-11
Fiscal year 1967 supplemental (NOA)	2,130	2,292	1,884	6,306

¹ Reflects \$8,000,000 reduction in procurement, defense agencies program.

TABLE 12.—Department of Defense: Major procurement item quantities, fiscal year 1967 and 1968 programs

[Millions of dollars]

	Fiscal year 1967 program			Fiscal year 1968 program
	Enacted funds	Supple- mental	Total	
Aircraft:				
Army.....	\$1,807	\$890	\$2,697	\$1,479
Navy and Marine Corps.....	560	487	1,047	680
Air Force.....	821	207	1,028	1,250
Total, all services.....	3,188	1,584	4,772	3,409
Helicopters.....	1,903	863	2,766	1,588
Other aircraft.....	1,285	721	2,006	1,821
Total, all services.....	3,188	1,584	4,772	3,409
Missiles:				
Army.....	34,715		34,715	26,237
Navy and Marine Corps.....	6,172	1,992	8,164	12,815
Air Force.....	4,777		4,777	5,273
Total, missiles.....	45,664	1,992	47,656	44,325
Ships, Navy:				
New construction.....	57		57	34
Conversions.....	8		8	21
Total, ships.....	65		65	55
Tracked combat vehicles:				
Army.....	4,437	1,392	5,829	4,797
Marine Corps.....	144	7	151	
Total, tracked combat vehicles.....	4,581	1,399	5,980	4,797

TABLE 13.—Department of Defense: Military and civilian personnel, yearend number

	Fiscal year 1965 actual	Fiscal year 1966 actual	Fiscal year 1967 estimate	Fiscal year 1968 estimate
Military personnel:				
Army:				
Officers	111,541	117,205	142,837	154,900
Enlisted	854,755	1,079,525	1,308,453	1,362,004
Military Academy cadets	2,017	2,316	2,910	3,096
Total, Army	968,313	1,199,046	1,454,200	1,520,000
Navy:				
Officers	77,720	79,457	83,773	85,014
Enlisted	588,353	660,130	665,298	673,031
Naval Academy midshipmen	4,179	4,331	4,243	4,243
Aviation cadets	757	551	80	-----
Total, Navy	671,009	744,469	753,394	762,288
Marine Corps:				
Officers	17,234	20,485	24,193	25,211
Enlisted	172,638	240,909	255,831	269,316
Aviation cadets	315	293	600	387
Total, Marine Corps	190,187	261,687	280,624	294,914
Air Force:				
Officers	131,141	130,285	135,986	137,828
Enlisted	689,585	752,913	759,250	745,697
Air Force Academy cadets	2,907	3,152	3,364	3,575
Total, Air Force	823,633	886,350	898,600	887,100
Department of Defense, total:				
Officers	337,636	347,432	386,789	402,953
Enlisted	2,305,331	2,733,477	2,988,832	3,050,048
Academy cadets and midshipmen	9,103	9,799	10,517	10,914
Aviation cadets	1,072	844	680	387
Total, Defense	2,653,142	3,091,552	3,386,818	3,464,302
Civilian personnel:				
Army	332,875	371,121	426,164	431,474
Navy	333,271	356,744	398,608	410,787
Air Force	291,496	306,911	319,462	325,796
Defense agencies, OSD	42,278	68,923	72,361	72,057
Total, Defense	999,920	1,103,699	1,216,595	1,240,114

CONTRACT FUNDS STATUS REPORT APPROVED BY THE BUREAU OF THE BUDGET

During December 1966 the Bureau of the Budget (BOB) approved the quarterly contractor reporting requirements described by DOD Instruction 7800.7, "Contract Funds Status Report" (CFSR). BOB's approval followed extensive coordination between industry representatives and Defense officials.

DOD and industry have a mutual interest in information about funding. The DOD manager must assure the adequacy of the funds for varied Defense programs, and at the same time exercise administrative fund controls on appropriations required by public law. Industry, on the other hand, is vitally concerned about receiving timely payments in appropriate amounts. Funds reporting has evolved from the need to satisfy both needs.

The first effort for uniform application throughout DOD in this area occurred in 1959 with the development of the financial management report, DD 1097. This report was designed to be used essentially to assess potential expenditure levels. As expenditure restraints eased, it was adapted to answer funding status questions. This

report proved to be inadequate from both industry and DOD points of view. To overcome its deficiencies, individual report versions were designed by the military departments to provide their representatives with better information. These reports were limited to a small number of contractors, and thus, did not require BOB approval.

To curb the tendency toward proliferation of data gathering efforts on this subject, DOD in 1964 undertook to install a single uniform approach for DOD-wide use. The resulting contract funds status report was developed through continuous consultation with industry. These consultations started in 1964 as a part of the cost and economic information system (CEIS). During March 1966, industry, through the Council of Defense Space and Industry Associations (CODSIA), was provided a draft version of the CFSR reporting instruction. CODSIA comments and recommendations were received in May 1966, and a series of joint DOD-industry meetings was held in late summer to discuss the CODSIA recommendations. Many changes were made to the original proposal as a result of industry comments. CFSR has benefited from this exposure. It can become a useful, workable document that will serve the needs of both DOD and industry.

In gaining BOB approval, the CFSR joins the cost information reports (CIR) and the economic information system (EIS) as visible parts of the selected acquisitions information and management systems (SAIMS).

The CFSR is designed to supply the funding data that, with other performance measurement inputs, will provide information about Defense contracts to DOD managers for:

Updating and forecasting contract fund requirements.

Planning and decision making on funding changes in contracts.

Developing fund requirements and budget estimates in support of approved programs.

The contractor compares current funding with estimated fund requirements and describes the relative firmness of requirements on which estimates are based. Reasons for changes in quantitative fund requirements are also to be submitted.

In view of the lead time required to adjust approved levels of funding when changes in estimated fund requirements are involved, reporting accurate information as early as possible is a matter of pronounced importance to the contracting parties (DOD and industry) who must use the information.

The CFSR will be implemented on all new contracts, which require funds status reporting, to replace reports such as the DD 1097, DD 1097 Addendum NAVWEPS 7810/4, and the contractor financial requirements estimate (CFRE). If suitable arrangements to incorporate this reporting requirement can be made, the current use of the aforementioned reports will be discontinued in existing contracts. The instructions (DOD Instruction 7800.7) include descriptions of data items which are the contractor's required input to the CFSR.

Questions concerning the implementation of CFSR should be referred to the Directorate for Assets Management Systems, Office of the Assistant Secretary of Defense (Comptroller), room 3B857, the Pentagon, Washington, D.C., 20301, telephone (202) OXford 7-7565.

Part II

ECONOMIC ANALYSIS OF IMPACT OF VIETNAM EXPENDITURES

This section consists of various papers, statements, and articles on aspects of the impact of Vietnam expenditures on the American economy. They are arranged in chronological order.

Several of the papers have been published subsequent to their original issue. The paper, "The Inflationary Impact of the Federal Budget," appears in the July-August 1966 issue of *The Financial Analysts Journal*. The paper, "The Outlook for Defense Spending—How Great an Uncertainty?," appears in the *1966 Proceedings of the Business and Economic Statistics Section, American Statistical Association*.

THE GUNS, BUTTER, AND THEN-SOME ECONOMY*

BY GILBERT BURCK

The United States could fight several Korean wars with just its annual increase in output; the Vietnam buildup, at its present pace, probably will not push the economy to capacity. But enlarged global responsibilities may raise future military spending.

Like the first surge of a rapidly rising river, the flow of U.S. materiel into South Vietnam has told the world that America is determined to lay out what it takes to hold the line in southeast Asia. Men and supplies, guns and ammunition, bulldozers and helicopters, and all the other military machinery provided by modern logistics have begun to inundate the little country as the United States consolidates its position in the grim business of war. Yet this war, like all wars, is more than a war. In the gigantic U.S. economy, upon which so much of the world depends, war is a powerful economic force. And it is not only a powerful force, but one that can be enlarged tremendously in a very short time. The war is also a force that is uncommonly volatile and unpredictable.

Because of Vietnam, the Nation is confronted with a wide variety of economic possibilities, diffused, overlapping and penetrable only by informed and careful speculation. The hope of many economists that military spending will rise just enough—but no more than enough—to take up the slack in the economy is a fragile one, already nearly squeezed to death by other more portentous possibilities. First and most immediate of them, so strong that it still amounts to a probability, is that despite the war the growth of U.S. output will slow down somewhat during the next 6 months. In that event, the United States could be in the odd position of fighting a difficult war while enjoying a sufficient surplus of resources to present it with something of a "peacetime" problem.

But other and opposite possibilities, though not imminent, are growing more minatory. Military men and their backers in Congress may wangle a big increase in military spending to compensate for what they regard as the penny pinching of Secretary McNamara's economy program; the cost of the Vietnam war may rise to much higher levels; general restlessness in Asia suggests that other Vietnams may break out without much warning; and the United States may soon embark on production of a whole new strategic weapon system, the Nike-X antimissile missile, which would soon begin to cost billions per year. And beyond that the United States may yet fall heir to most of the British commitment in the Far East. All these possibilities suggest that defense spending could later rise considerably higher than has been commonly expected. A combination of such possibilities, depending on when and how they arise, could conceivably

*Reprinted from *Fortune*, October 1965.

elevate military spending to the point where the Nation's resources would be hard pressed, where many Great Society programs would have to be shelved, where taxes would have to be raised, and even where wage and price controls would have to be invoked.

One great circumstance, however, should give U.S. citizens a large need of security. Barring Armageddon itself, the U.S. economy has grown so large that it can take on its world responsibilities with an astonishingly small percentage of its total effort. Just since the Korean war, the United States has added to its gross national product the equivalent of more than two-thirds of the total national production of the Soviet Union. The Nation's annual growth is now several times the annual military cost of fighting the Korean war, and its immense and growing armed power actually takes much less of its total output than it did a decade ago. The Russians are said to regard the invasion of Korea as the biggest postwar mistake of international communism because it touched off a major U.S. military buildup; for the same reason the Chinese Communists may some day regard Vietnam as a great error. Plainly the United States can maintain its might at a level sufficient for its aims and maintain it without straining its productiveness at all.

The U.S. economy should have enough excess capacity to accommodate next year's defense spending easily enough. Before the Vietnam buildup, many businessmen and a few economists believed that the great 56-month expansion would continue practically unabated through 1966. But many others, including *Fortune's* Business Roundup, argued that a slowdown of the growth rate was in the cards for next year, and believe a small one still is. This case rests on the argument that three sectors of the economy have expanded at a rate they cannot maintain: (1) consumer spending on goods has expanded a little too fast, partly because installment and mortgage credit have increased at a rate that cannot keep up; (2) inventory accumulation, owing mainly to hedging against a steel strike, has been excessive, and will probably be reduced severely; and (3) capital spending by manufacturers has been and still is rising so fast that it is bound to generate excess capacity. As all three slow down, they would tend to decelerate (not stop) the growth of the economy as a whole.

HOW MANY DEFENSE BILLIONS IN 1966?

At all events, the big question is how much and when military spending will boost business. The answer seems to be that although the plans for the buildup may give the economy a psychological lift, nothing that Vietnam will do to military spending over the next 6 months is likely to keep it growing at its recent rate of more than 4.5 percent a year. The Armed Forces, during the next 10 months or so, will be increased by some 376,000—340,000 military and 36,000 "direct hire" civilian personnel. President Johnson talked of sending only 125,000 men in all to South Vietnam, but extra Marines have already gone there, and the best unofficial estimates in Washington say that some 250,000 men will be landed before the end of fiscal 1966 (June 30). Although Johnson decided not to call up reserves, the Defense Department is taking appropriate steps to "maximize" their readiness.

Even before the manpower increases were announced last July, Defense Department spending had begun to turn up sharply from its

rather depressed level of early 1965. Although the Pentagon originally expected to spend \$51.2 billion in fiscal 1965, delays and economies in procurement resulting from Secretary McNamara's cost-cutting program kept actual outlays down to only \$47.4 billion, or \$1.6 billion less than the estimate for fiscal 1966. But last spring the Defense Department increased its spending steeply toward the budgeted level for 1966; and then, as the Vietnam "situation" worsened, it revised its goals sharply upward. Not only is Defense spending the \$49 billion it planned to spend last January, it has twice asked Congress for more. In May it got authority to spend an extra \$700 million, and in August it got its second "supplemental" of \$1.7 billion. It is also taking advantage of Section 512c of the appropriations act, which allows it to commit itself to outlays for operation, maintenance, and personnel—e.g., outfitting and training draftees—without prior appropriation by Congress.

Next January, Defense will again petition Congress for a large spending permit, partly to cover outlays made and planned under section 512c. This request will be for at least \$4 billion, possibly more than \$6 billion. Whatever its psychological impact, however, it will not result in \$5 billion or \$6 billion additional spending in the fiscal year ending June 30, 1966; contracts are still to be made, and the bills for many will not come due until fiscal 1967 or 1968. The Pentagon's actual increased spending in fiscal 1966 will include \$800 million to take care of the \$1 billion pay rise granted last August, about \$1 billion for added military personnel, and perhaps \$1.7 billion of the \$2.4 billion in "supplementals" it got last spring and summer. Thus outlays will probably total about \$3.5 billion above last winter's estimate, or \$52.5 billion in all. By late spring or early summer, of course, Defense will be spending at a higher level—say at an annual rate of about \$55 billion.

What the \$3.5 billion "extra" to be disbursed in fiscal 1966 does for the economy will depend on what it goes for. About half will be used for manpower increases—pay, uniforms, food, housing, etc. Since the Pentagon will add men to the forces at the rate of only 35,000 a month, the annual rate of outlays for them will not be attained at least until next summer. Thus the total cost for new military personnel, including the cost of clothing, housing, shipping, and paying combat rates to the men shipped to Vietnam, will probably come to no more than \$1 billion by July, 1966. The cost of ocean transportation is hard to estimate. No stepup for capital outlays is yet called for; Defense has chartered some 55 modern vessels, has taken over a score or so from the Maritime Administration's large reserve, and can get more where those came from. The United States needed 600 to 800 ships in the Korean fracas, but these figures provide little edification. A lot of men are now being flown to the Far East, and in any event the buildup is slow enough so that the present inventory of ships, including Navy-operated vessels, may be adequate.

To the extent that some men will eat better in the services than they did at home, food buying will be stimulated. If an employed youth is drafted and his job goes to an unemployed man, the economy is stimulated. But the difference between an unemployed man's income and a soldier's pay and upkeep may not be very great. There will be less Government spending on unemployment benefits and other Federal programs than there might have been. Other factors, includ-

ing psychological ones, may inhibit popular spending. Employed young men about to be drafted and older men awaiting a call from the reserves may not be inclined to go into debt to buy durables.

The other half of the increase in the Defense Department's present spending will have a somewhat more positive effect on business, for it will go mainly for construction, ammunition, ordnance, and aircraft. At least \$150 million is programmed for construction in South Vietnam, much of it to make Camranh Bay into a great port. A good deal of this money will be spent in South Vietnam, whence part of it (along with some troop pay) will find its way to France, still one of South Vietnam's big suppliers, and may there ironically add to the U.S. balance-of-payments problem. But outlays at home for ammunition and ordnance (not counting missiles), which exceeded \$1 billion in fiscal 1965, may more than double in fiscal 1966.

During the past few years Defense has been laying out between \$6 billion and \$7 billion annually on planes, and the caption on page 121, which describes some of the craft being bought or considered for Vietnam, suggests the figure will rise considerably. Except for helicopters, however, most planes on order or on the list will have a long lead time. Defense, for example, is expected to order some 60 of the new C5-A giant transport planes, and spend about \$2.2 billion on them. Deliveries will be spread over 5 or 6 years.

For all its impact, spending on ammunition, ordnance, and aircraft does not stimulate the economy as much as, say, a tax cut of comparable dimensions. When consumers are handed buying power in the form of a tax cut, their suppliers build up inventories to accommodate the new level of demand; the economy thus gets a double direct boost. It also gets an indirect boost when private capital is spent to expand factories and stores to take care of the new demand. But the Defense Department may supply a military contractor with machine tools from its stockpile, in which case the economy gets no stimulus, direct or indirect. Or Defense may advance him dollars in the form of progress payments to take care of working capital and equipment needs. In that event, the economy may get only a one-shot boost, for the contractors' suppliers are not likely to build up their stocks permanently until more orders come in.

All in all, to repeat, military spending as now scheduled may be insufficient, if a slowdown is in the cards, to keep the U.S. economy growing at its recent rate of about 4.5 percent a year (in constant dollars). Appropriately enough, the President's fiscal advisers, including the Council of Economic Advisers, are seriously discussing future tax cuts. "Indeed, we are still worried about slack in the economy," says one of the CEA staff members.

THE "SECRET" REPORT

The slack may be a short-lived worry. Next January the Defense Department will ask Congress for more supplemental appropriations and will make public its preliminary estimates of needs for fiscal 1967. Suppose it requests not \$5 billion or \$6 billion but \$10 billion or so more in supplementals, to be spent over a few years; and suppose it follows this with an estimate of more than \$55 billion for 1967. Such figures would almost surely portend average annual military outlays of around \$60 billion, or \$10 billion above the current level, perhaps

beginning in fiscal 1967. The prospect of \$60 billion a year, almost everybody agrees, would keep the economy at capacity and perhaps threaten to overheat it, especially since the Armed Forces would then be using up scarce manpower. Merely in anticipation of this level of spending, business would be less inclined to reduce excessive inventories, and more inclined to keep its capital spending high. Tax cuts would go out the window. There would be talk of inflation, of cuts in nondefense Government spending, of voluntary wage and price restraints, perhaps of controls.

One influence that may help convert such a possibility into actuality is a remarkable 100-page "secret" report put together under the auspices of the Preparedness Subcommittee of the highly regarded Senate Armed Services Committee. The report argues that even before the Vietnam buildup Defense should have been spending billions more a year for Army procurement. It points to shortages and obsolescence in radio, spotting, and warning equipment, and guidance and control systems; in trucks, troop carriers, and helicopters; in machinegun, antitank-gun, and rifle ammunition. The report also urges an immediate funding for new procurement, and estimates that the Army alone needs between \$12 billion and \$18 billion worth of additional equipment during the next 5 years. On the assumption that the other services have suffered similar underprocurement, many have estimated the total "shortfall" in terms of \$5 billion a year or so.

Senator John Stennis, of Mississippi, chairman of the subcommittee, admits there is no evidence of shortages in Vietnam; the so-called shortages one reads about there are generally a simple problem of transporting equipment to where it is needed. But Stennis argues that to keep forces in Vietnam well supplied the Army has had to strip assets and resources of the Reserves and active forces elsewhere. Hanson Baldwin, the well-informed military correspondent of the *New York Times*, has long criticized McNamara's lean budgets and recently let it be known that one of the reasons President Johnson did not call up the Reserves for Vietnam last July was that they lacked training and equipment. If true, this alone could presage a large increase in procurement.

McNamara naturally disagrees with the charges—stubbornly; sharply, and explicitly. He and his staff point out that the Armed Forces are in a much higher state of readiness than they were 5 years ago, "particularly in the kinds of forces we now require in southeast Asia," and they argue that the shortcomings cited in the report make little real sense. No army is ever completely modern, they say, nor does it want to be if production lines are to be kept open, and if large blocks of equipment are not to be out of date at once. Furthermore, they say, standards of logistic readiness cannot be used to measure combat readiness.

STEP-UP IN VIETNAM

But even by their own definition the time may be at hand to start producing for war. Georgia's Senator Richard Russell, chairman of the Armed Services Committee, is one important figure who seems to think so. He defines need as "everything on earth the American soldier can possibly need to fight a battle," and insists that Defense will have to spend much more. He has denounced a "casual attitude toward a situation that holds greater dangers than those inherent in

the Korean conflict," and forecasts that the war will have a big effect on the economy. For he sees as many as 300,000 topflight U.S. soldiers in South Vietnam, and is sure that Congress will vote the money even if the conflict costs upwards of \$10 billion a year more than it is expected to cost.

Whether and how much the action in Vietnam will be accelerated is a question that makes anything properly describable as calculation next to impossible. Some believe the conflict can be kept within limits. The failure of the Vietcong to take advantage of their big chance in the last monsoon season suggests that the United States can secure its bases and help enlarge the South Vietnamese area of control without enlarging its effort beyond present plans. But the war, as everyone is well aware, is being stepped up; and there are strong reasons for thinking the U.S. commitment will have to be increased further. If only as a matter of military economics, many argue, a combatant with the potential of the United States is bound to throw more and more power into the conflict, hoping to achieve its ends less expensively by achieving them sooner rather than later.

What is more to the point, both the strength and the resolution of the enemy are formidable. Some 250,000 Americans, as already noted, may well be sent to South Vietnam. But this may not be enough. Now the old notion that it takes 10 men to counteract one guerrilla, based on past wars including that of the British in Malaya, is no longer taken very seriously in an army whose firepower can be substituted for manpower. As McNamara himself has said again and again, a ratio of 3 to 1 may be too low, but a ratio of 10 to 1 is excessive. How do the figures stand?

It appears that the Vietcong number at least 65,000 hard-core guerrillas and anywhere from 85,000 to 135,000 part-timers, plus two regular North Vietnamese divisions: total 170,000 to 220,000. The South Vietnamese forces, everybody hopes, come to 600,000; add 250,000 Americans, and you have 850,000. This might amount to a ratio of 4 or 5 to 1.

This is only part of the story. The North Vietnamese "people's army" consists of 200,000 regulars and more than 250,000 semiregulars, reinforced by large reserves, a well-armed border police force, and hundreds of thousands of volunteers "ready to go." Bernard B. Fall, professor of international relations at Howard University and an old Vietnam hand from the days of the French defeat, holds that this force is one of the toughest, largest, most courageous, politically educated, and fanatically devoted armies in the world. He suggests it may move south to support the Vietcong, and also suggests that it might be supported, as it was against the French, by Chinese "volunteers" or Russian "technicians." A mass movement of North Vietnamese troops, of course, would make this a new war, and one made to order for U.S. airpower. Still, it would surely take more manpower. The possibility that another 250,000 U.S. troops may yet be moved to Vietnam, at a cost of \$5 billion or more a year, is manifestly not sheer speculative fantasy. "If we stay in, we must stay in with a hell of a lot of power," says Robert Lovett, Truman's Secretary of Defense. "You cannot skimp on power, and you cannot half fight a war. And no quartermaster was ever hanged for ordering too much of what's needed."

BILLIONS MORE TO GO

Other magnitudes of possible military spending, though not so immediate as Vietnam, are not so very distant either. This fall or winter, for example, the decision will be made on whether to produce the Nike-X, the great antiballistic-missile system. An article in *Fortune* next month will explore the uses of the Nike-X; suffice it to say here, that, depending on what strategy is adopted, this weapon system can cost anywhere from \$8 billion to \$40 billion, starting with only \$250 million the first year but building up steeply over 7 or 8 years.

As the insane conflict between Pakistan and India illustrates so vividly, war and revolution are endemic in the Asian subcontinent, and nothing gratifies the Chinese Communists more than to see them flourishing. If Thailand is relatively secure, not so much perhaps can be said for its neighbors Laos and Cambodia. And over the longer run it looks as if the United States would wind up as the only Western Power with large international commitments—and additional billions in military and other spending. Britain, the only other Western Power extensively involved overseas, is increasingly restive under its load. The British defense budget is about \$6 billion, or 6.6 percent of GNP, almost as large a percentage as that of the United States. Worse, the country's still farflung military organization is responsible for about \$850 million or 77 percent of the U.K.'s \$1.1 billion (estimated) balance-of-payments deficit, the most important problem facing a nation that is living beyond its means in the sense that it cannot export enough to pay for its imports.

Defense Minister Denis Healey accordingly has announced an interim program for cutting the British defense budget by \$600 million or 10 percent, and warns that more reductions will be in order unless the country's balance of payments takes a quick and satisfactory turn for the better. The interim cost-reduction program is supposed to be achieved mainly by drastic economies that will not alter existing commitments. Up until recently British military accounting was practically nonexistent, but with the help of the Pentagon, the British military establishment is being McNamaraized. The United States wants dearly to keep the British in the game, and not only because it doesn't want to be the only Western country policing the world. The British can play the game more cheaply than the United States; a good part of the British forces in Malaysia, for example, consist of low-paid Gurkha troops. And the continuing presence of the British is a stabilizing influence in countries where the sudden withdrawal of colonial rule has left people disoriented.

"WHAT ARE WE DOING THERE?"

Whether McNamaraizing the British military establishment will suffice to keep it in the game is another matter. Britain has already proposed reducing its military outlays in Germany. Now the question of whether its strongholds east of Suez are worth hanging on to is being debated. The British are spending about 20 percent of their defense budget east of Suez, and committing a third of their purely military strength to Malaysia and Singapore. The 50,000-man British force in Malaysia, relatively cheap as it is, costs around \$300

million a year, or six times the profit sent home from British investments there; such is latter day "imperialism."

In 1963, Britain signed a treaty binding itself to defend the Malaysian Federation, and it has honored that pledge. But the whole subject was blasted open in August when Singapore suddenly withdrew from the federation. In an editorial entitled "What Are We Doing There?" the *Economist* asked a few questions of the kind bothering many Britons: "Just how necessary is it that Britain should be in a position to restrain Dr. Sukarno or his—quite possibly Communist—successor? What part ought Britain to play in containing China?"

If the British decide to phase out of Singapore or to reduce their commitment in the rest of Malaysia, Malaysia might become another Vietnam. It might anyway. The United States, in any event, may find itself obliged to take up the slack there, as it may in many another place east of Suez. The British, for example, want to get out of Aden, on the southwest corner of the Arabian Peninsula, even though some Britons regard it as vital to the country's Persian Gulf oil interests.

An important question is whether even existing British bases in the East are now enough—i.e., whether they are located in the most advantageous positions to box in southeast Asia and Africa. The United States may want to, indeed may have to, move in to back up and enlarge the West's outposts by establishing communication centers, supply bases, ports, and airports on a number of well-placed British islands in the Indian Ocean and off the coast of Africa.

Meantime U.S. obligations in Europe, which are great, cannot easily be reduced. Some 250,000 of our best-trained men are stationed in Germany. Just as the Chinese and other Asiatics would misread a withdrawal of troops from Korea, so the Russians might be emboldened by a sizable reduction of forces in Germany, or more precisely by a U.S. commitment to Asia on a scale that would deplete European reserves. Some U.S. specialists have already been shipped to Asia, and the West Germans get alarmed every time a group leaves.

Any speculation on future increases in military spending must weigh the possibility that France might pull out of NATO, and that our pipelines, bases, hospitals, etc., will have to be moved outside France. This restructuring of European military deployment will be expensive, even though the United States is developing a kind of long-range logistics system to offset it. The Pentagon finds, for instance, that it can often fly spare parts right from the United States more cheaply and expeditiously than it can maintain many depots abroad; everything needed for B-52 bombers is now stored in Texas, and for the F-100's in Utah.

INFINITE COMBINATIONS

The precise effect of any of these various defense spending possibilities on the country depends of course on *if* and *when* each becomes an actuality; the balance of an economy can change very fast when it is growing at around \$30 billion a year. The range of possibilities is almost infinite. If the Vietnam conflict subsides, annual military spending may not rise above the \$55 billion now in prospect; but a stepup to a rate of \$60 billion or more by next summer would surely

keep business humming. Depending on the strength and weaknesses in the rest of the economy, so might the same rate a full year later. And if by some outside chance Vietnam and other commitments were to accelerate steeply and simultaneously, and annual military spending were to hit a rate of \$65 billion by late 1967, the Nation still might not have to resort to direct controls as it did during the Korean war. For a \$65 billion level would still represent a stepup of \$15 billion in 2 years. Given such a stimulus, the economy would be sure to grow, in the same period, by some \$60 billion, or four times the increase in defense spending. In other words, the productive power of this guns, butter, and "then-some" economy is so immense that it can take almost any foreseeable defense increase in stride.

WINGS OVER VIETNAM

Dirty little ground wars like Vietnam were low in the Pentagon's calculations when the U.S. jet-age air force was planned. Consequently the war in Vietnam has opened up new areas of plane and helicopter procurement. Among the favorites and the candidates:

1. Hughes's OH-6A light helicopter, designed for observation; 714 are on order for the Army, and as many as 4,000 eventually may be ordered. The war looks like one in which helicopters will take the place of tanks and trucks; the Army has increased its helicopter companies to perhaps 50 each with 30 machines.
2. Boeing's CH-47A (Chinook) medium transport chopper, good at moving cargo and combat troops. The Army will spend at least \$125 million on them.
3. Bell's UH-1 (Iroquois or Huey) helicopter, also for cargo and troop transport. The Defense Department has ordered at least 1,500 at roughly \$140,000 each.
4. Northrop's \$700,000 F-5 twin-jet tactical fighter, which can carry a heavy bomb load and yet fly (after dumping its load) at 1,000 miles per hour. None has yet been ordered, but the F-5 may be one successor to the 18-year-old Douglas A-1 Skyraider, a piston-engine fighter whose ability to carry more than its weight in bombs proved invaluable not only in Korea but in Vietnam.
5. Ling-Temco-Vought's A-7A, a light attack bomber that can carry twice as much as any other plane in its class and carry it farther. It is also a candidate to succeed the A-1.
6. Lockheed's C-141 is doing most of the air-ferrying of men and material to Vietnam. It will be succeeded, in 2 or 3 years, by the giant C5-A, which will carry as many as 700 men or as much as 110 tons.
7. For counterinsurgency (COIN) jobs the Pentagon is considering a number of light armed reconnaissance planes. One of the candidates of North American Aviation was the YAT 28.
8. Hoping for orders, General Dynamics has gone ahead and built prototypes of its own counterinsurgency plane, the Convair Charger.
9. Even civilian planes, such as the new Piper Cherokee 6, are being considered for counterinsurgency work. Piper is just working up to production of three a day for the civilian market.

THE INFLATIONARY IMPACT OF THE FEDERAL BUDGET*

By MURRAY L. WEIDENBAUM, associate professor of economics at
Washington University

An article in a recent issue of the *Journal of Finance* states, "If fiscal policy is to be developed into a more precise art, if not a science, then it is crucial to be able to pinpoint more accurately the timing and the extent of impact of fiscal measures."¹

The purpose of this article is to point out that the present time provides an important example of the need to understand the timing of the economic impact of fiscal measures. Moreover, an improved understanding may, it will be argued, lead to the conclusion that the inflationary impact of the January 1966 Budget submission has been underestimated and that fiscal policy measures may need to be modified substantially.

It has been pointed out in the literature on public finance that the impact on employment, production, and income of a military buildup may occur primarily at the point in time that budget recommendations are made, increased appropriations are enacted, and orders placed with military contractors. Although this may appear quite obvious to those acquainted with defense industries, the standard measures of Federal fiscal performance—such as the statement of Federal receipts and expenditures on national income account or the computation of the "high" employment budget surplus—confine the measurement to the actual delivery of completed weapons and other military "hard goods".

Immodestly, I cite the results of a detailed study of mine which examined the economic impact of each step in the long process between budget recommendations for military procurement and delivery of the completed items to the government and payment therefore.

The primary effect on productive activity, to the extent there is any, occurs in advance of the actual government expenditures. Under most circumstances, the placing of orders induces production on government accounts and such production remains in the private sector and does not show up as government expenditures until it is completed and the goods involved delivered to the public sector.²

This point was elaborated in testimony before the Joint Economic Committee in 1962 where it was shown that, conceptually, production on government order is not reflected in Government purchases of goods and services at the time the work is performed. This activity, as measured by the cost incurred, is currently included in the gross national product, in the change in business inventories. When the

* Reprinted from *Financial Analysts Journal*, July-August 1966.

¹ Joseph Scherer, "On Measuring Fiscal Policy," *Journal of Finance*, December 1965, p. 683.

² M. L. Weidenbaum, "The Timing of the Economic Impact of Government Spending," *National Tax Journal*, March 1959, p. 85.

Government contractor delivers the finished items, the transaction shows up in the national income accounts as a decline in business inventories:

It also is then recorded as a Government purchase of goods and services. These two entries tend to cancel each other out, with no net effect on GNP. At the time it is recorded in the national income accounts, the Government purchase does not represent payments to the factors of production; it is more in the nature of an intersectoral transfer—a reimbursement to the Government contractor for his outlays during earlier periods.

It is at the order stage that the government action normally will have its initial and often major impact on the markets for labor, raw materials, and financial resources. The contribution to economic activity is made during the production period prior to the actual government "purchase." Indeed, the recording of the government purchase may coincide in time with a reduction in governmental impact on total demand.³

HISTORICAL EXPERIENCE

If we reflect upon a previous military buildup effort of the United States—the Korean mobilization—we can see that the proper understanding of the timing of the economic impact of such government activity can have important consequences for Federal fiscal policy. The \$3.5 billion budget surplus during the first year of that defense expansion—fiscal year 1951—was hardly adequate in a period of rapid military buildup, as indicated by the accompanying inflationary pressures of substantial proportions.

Using conventional measures, Federal expenditures remained fairly stable during 1951. In contrast, the amount of appropriations and other "new obligational authority" granted by the Congress for the year was 68 percent above the 1950 total. The aggregate amount of contracts let and other obligations entered into by the Federal agencies almost doubled in the first year of the Korean mobilization program. The interplay during that crucial period of the opposing tendencies of the opposite ends of the Federal spending process was clearly brought out in the following comment on this period by the Joint Committee on the Economic Report:

¹ The ineffectiveness of the governmental cash surplus, normally a deflationary force, was, in large part, attributable to anticipatory forces on the inflationary side arising from the current or expected placement of orders for future deliveries.⁴

The following year, fiscal 1952, was the period of the actual major increase in Federal defense expenditures; it was one of comparative stability in the American economy. Several interesting points emerge from an examination of the Korean mobilization program:

1. The major expansion in economic activity occurred at approximately the same time as the announcement and authorization of the program, and while many of the defense orders were being placed.

³ "Statement of Murray L. Weidenbaum" in U.S. Congress, Joint Economic Committee, *Inventory Fluctuations and Economic Stabilization*, 1962, pp. 170-179. See also Edward Greenberg, *Employment Impacts of Defense Expenditures and Obligations*, Washington University, Department of Economics, Working Paper 6505, April 29, 1965; Michael Spiro, *Impact of Government Procurements on Employment in the Aerospace Industry*, Massachusetts Institute of Technology, Alfred P. Sloan School of Management, Working Paper 134-65, November 1965.²

⁴ U.S. Congress, Joint Committee on the Economic Report, *National Defense and the Economic Outlook for the Fiscal Year 1953, 1952*, p. 49.

2. The expansion in economic activity slowed down at about the same time that the rise in new obligational authority slowed down.

3. The major rise in economic activity occurred prior to the major rise in government expenditures.⁵

Because the early stages of the government spending process often show up in the private sector rather than in the public sector—particularly private production on government account—it is a temptation, during periods characterized by sharp increases in government purchasing, to conclude that private rather than government demand is contributing the inflationary pressures. The following is an example of this shortcoming which often mars otherwise cogent analyses. The author is discussing the first year of the Korean mobilization program:

This great increase in private demand took place at a time when the federal budget was running at a surplus, and when the direct increase in expenditure for security programs was quite small. Thus most of the inflation in the year after Korea can be said to have been caused by the large volume of private spending. *The important point is that Federal fiscal policy cannot be held directly responsible for the inflation.*⁶

Maintaining that Federal fiscal policy was not inflationary during a period when the rate of military orders was doubling and constituted the major expansionary force in the economy may, in retrospect, appear to be a somewhat odd interpretation. However, the purpose here is not to dwell about ancient error, but to examine the possibility of its being repeated at the present time.

THE JANUARY 1966 PRESIDENTIAL MESSAGES

The budget message of the President issued in January 1966 states:

This budget presents a responsible fiscal program. It accommodates our foreign and domestic responsibilities in an environment of strong but noninflationary economic growth.⁷

The January 1966 Annual Report of the Council of Economic Advisers estimates that both the actual and high employment (née "full" employment) budgets on the national income accounts basis are expected to be approximately in balance in fiscal 1967.⁸

The text of the report does not cover 1966. However, the statistical appendix provides some extremely useful information. It shows that the Federal Government is anticipated to move from a point of some restraint in fiscal 1965—a surplus of \$1.2 billion on the national income account basis—to a deficit of \$2.2 billion in 1966. No estimate is presented for 1966 on a "high employment" budget basis.

The body of the Economic Report does not explain why fiscal policy will shift from mild restraint in 1965 to a somewhat expansionary condition in 1966. However, this point becomes more acute when attention is drawn to the measures of the early stages of the government procurement and expenditure process.

Appropriations and other new obligational authority is estimated to rise (on an administrative budget basis) from \$106.6 billion in fiscal

⁵ M. L. Weidenbaum, "The Economic Impact of the Government Spending Process," *Business Review*, University of Houston, Spring, 1961, pp. 39-40.

⁶ W. Glen Campbell and others, *Economics of Mobilization and War*, Homewood, Ill., Richard D. Irwin, 1952, p. 75.

⁷ *The Budget of the United States Government for the Fiscal Year Ending June 30, 1967, 1966*, p. 9.

⁸ *Economic Report of the President, 1966*, p. 54.

1965 to \$126 billion in 1966, an 18 percent growth. Compared to this \$19.4 billion rise, budget receipts are projected to go from \$93.1 billion to \$100 billion during this same period—an increase of only \$6.9 billion. As shown in table 1, the bigger increase in revenues will occur in fiscal 1967, when the expansion in new funding will have dampened down.

TABLE 1.—Selected measures of Federal finance

[In billions]

	Fiscal years—		
	1965	1966	1967
New obligational authority.....	\$106.6	\$126.6	\$121.9
Budget receipts.....	93.1	100.0	111.0

Source: 1967 Budget, pp. 11, 16.

TABLE 2.—Selected measures of military finance

[In billions]

	Fiscal years—		
	1965	1966	1967
New obligational authority.....	\$50.5	\$63.3	\$59.9
Obligations incurred.....	50.2	63.7	62.8
Expenditures.....	47.4	54.2	58.3

Source: U.S. Department of Defense, FAD-524, Jan. 24, 1966.

An examination of the available measures of the military budget is quite revealing. As shown in table 2, the entire current expansion in new obligational authority and obligations to be incurred for the Department of Defense is scheduled for fiscal 1966; in fact, declines are projected for 1967. In contrast, the expenditure rise is slower in 1966 and continues to 1967. It would appear, on the basis of the published materials, that the major expansion in Federal programs will occur during the present year and that fiscal restraint will not take hold until next year.

SUMMARY

Given the nature of the military and political assumptions underlying the 1967 budget, an evaluation of its economic impact is hazardous. Nevertheless, it would appear, on the basis of the justifications and explanations accompanying the document, that the current, immediate inflationary potential—during the fiscal year 1966—has been virtually ignored. The fiscal policy sketched out for 1967 may be adequate, assuming no Vietnam supplemental in the 1968 budget, but this writer has the uneasy feeling that the inflationary experience that accompanied the first year of the Korean expansion may be repeated at the present time, although on a reduced scale. Hence, once again, failure to focus on the full range of measurements available of the economic impact of the government spending process may result in inappropriate fiscal policies being adopted.

THE VIETNAM WAR: A COST ACCOUNTING *

BY WILLIAM BOWEN

The Vietnam war is peculiarly expensive, far more so than is generally thought. Costs are running above \$13 billion a year, and are headed up. *Fortune's* figures suggest that we're in for bigger defense budgets—and new economic strains.

What happens in the U.S. economy over the next year or two, what happens to demand and production and prices and taxes, will to a large extent depend upon the cost of the Vietnam war. If anyone inside the Pentagon knows the current cost, he is not telling, nor, of course, is anyone there telling about costs associated with future operations. Accordingly, *Fortune* has undertaken on its own to figure out the cost—present and prospective—of the Vietnam war. It is already costing a lot more than almost anybody outside the Pentagon imagines.

At present, with about 235,000 U.S. servicemen in South Vietnam, the U.S. costs are running at a yearly rate of more than \$13 billion. Costs, it should be observed at once, cannot be translated mechanically into expenditures; a drawdown on inventories involves a cost, but may not involve an expenditure for quite some time. Still, if the war continues at only the present rate through fiscal 1967 (the year beginning next July 1), the resulting Defense Department expenditures will probably exceed the \$10 billion or so that the hefty 1967 defense budget officially allows for the Vietnam war.

But the war, it appears, will get bigger. U.S. Senators who know what Defense Department witnesses say in closed congressional hearings have predicted a U.S. buildup to 400,000 men, or more. Gen. William C. Westmoreland, the U.S. commander in Vietnam, has reportedly requested a buildup to 400,000 by the end of December. With that many U.S. servicemen in South Vietnam, the cost of the war would run to \$21 billion a year—even more if bombing and tactical air support increased in proportion to the buildup on the ground. At any such level the Vietnam war would bring on economic strains beyond what most economists appear to foresee, and beyond what makers of public policy appear to be anticipating. The strains would surely add to the pressure for higher taxes.

In its Vietnam cost accounting, *Fortune* had considerable help from outside economists, but no access to classified data. The basic sources were public documents—Federal budgets, Defense Department publications, transcripts of congressional hearings. Defense Department officials interviewed were persistently wary of discussing the costs of the war, although the department proved willing to pro-

*Reprinted from *Fortune*, April 1966.
The cost analysis for this article was carried out by a team consisting of, in addition to Mr. Bowen: Alan Greenspan, president of Townsend-Greenspan & Co., consultants; P. Bernard Nortman, independent economic consultant; Sanford S. Parker, chief of *Fortune's* economic staff; and research associate Karin Cocuzzi.

vide some missing bits of factual information that would otherwise have been unobtainable. It turned out that some costs—of ammunition, for example—could be easily calculated from published Defense Department figures. But getting at some other costs required elaborate calculations, and still others could only be estimated. Estimates and assumptions were in all cases conservative. The results, set forth by category below, represent what is probably the first serious effort outside the Defense Department to analyze the costs of the war.

The purpose of the undertaking was not to make a case against (or for) the fiscal 1967 defense budget, but to provide a basis for looking beyond the budget and assessing the potential economic effects of the war. In wartime no defense budget can sensibly be viewed as a hard forecast of defense spending. Actual expenditures during the fiscal year will be determined by unfolding events that no budgeter can foresee months in advance. So far as the economy is concerned, then, what counts is not budget projections but Defense Department orders and expenditures.

The costs and expenditures resulting from a war do not match up in the short run. They rise and decline in different trajectories. In the early phases of any war, the Defense Department can hold down expenditures by drawing upon existing forces and supplies, just as a business firm can temporarily reduce cash outlays by letting inventories dwindle, or a family can cut next month's grocery bill by eating up the contents of the pantry. Later on in the war, expenditures catch up with costs. It must be kept in mind that "expenditures," as used here, means *incremental* expenditures—those that would not be required if it were not for the war.

An idea of the movements of costs and expenditures and defense orders, and their changing economic effects, can be gathered from the following budgetary-economic scenario of a medium-sized war—i.e., a war not very different from the one in Vietnam.

A WAR IN FIVE ACTS

Act I. It looks like a small war, and it requires only smallish incremental expenditures. The forces sent overseas are members of the existing Defense Establishment, and the Defense Department would have had to pay, feed, and otherwise provide for them if they were doing peacetime duties in Georgia instead of fighting guerrillas in a tropical republic. The weapons, ammunition, and equipment come from existing stocks. The extra expenses (hostile-fire pay, transportation) can be temporarily absorbed in the immensity of the defense budget, and the administration does not have to ask Congress for supplemental appropriations to finance the war. It is being financed, in effect, through "reduced readiness"—that is, the United States has fewer trained men and smaller stocks of war matériel to deploy or use in any other contingencies.

Act II. The struggle has expanded, and the Armed Forces need extra inflows of men and matériel to compensate for the unexpectedly large outflows to the war zone. The Pentagon places contracts for additional arms, ammunition, equipment; it expands draft calls and recruitment efforts. The administration asks Congress for supplemental appropriations. War expenditures are still only moderate, but with defense orders increasing and inflationary expectations

beginning to stir, the war is already having noticeable effects upon the economy.

Act III. The U.S. buildup in the war zone has continued. The administration has asked Congress for large supplemental appropriations. Spending still lags behind costs, but it is rising fast—the recruits in training have to be paid, and so do the additional civilians hired. The war's economic effects, moreover, are expansionary out of all proportion to the actual increases in defense spending: the surge in defense orders has increased demand for skilled workers, materials, components, and credit in advance of deliveries and payments. To some extent, the Defense Department's matériel buildup is being temporarily financed by the funds that contractors and subcontractors borrow from banks against future payments from the U.S. Treasury.

Act IV. The U.S. military buildup in the war zone tops out. Defense production continues to rise, but the *rate* of rise is much less rapid than in Act III, and the expansionary economic force exerted by the war begins to wane. Deliveries of arms, ammunition, and equipment rolling into military depots more than match the chewup of matériel in the war, and so some replenishment of inventories takes place. Men are moving out of training and into operating units faster than forces are being sent overseas, and so there is a net buildup of trained, deployable military forces in the United States. Expenditures catch up with costs.

Act V. The war ends. The dropoff in contract awards and the collapse of inflationary expectations reverberate throughout the economy. Far from falling steeply, expenditures continue to rise a bit before entering into a gradual decline: the incoming deliveries must be paid for, and the men brought into the Armed Forces must be provided for until they are mustered out. With deliveries no longer partly offset by wartime chewup, inventories fill rapidly, and begin to overflow. During the period of readjustment, military manpower and military inventories exceed normal peacetime requirements. Expenditures for this excess readiness largely make up for the expenditures deferred through reduced readiness in the early phases of the war.

In January, 1965, the Vietnam war was still in act I, and to all appearances nobody in the administration expected an act II. The President's budget message declared that, with the "gains already sheduled," U.S. military forces would "be adequate to their tasks for years to come." The new budget projected a *decrease* in defense spending in fiscal 1966, and a *decline* in total uniformed personnel. Maj. Gen. D. L. Crow, then Controller of the Air Force, subsequently testified at a congressional hearing that "the guidelines for the preparation of the budget as they pertain to Vietnam were actually a carry-forward of the guidelines that were used in the preparation of the 1965 budget, and they did not anticipate increased activity, per se, in Vietnam."

IT'S NOW ACT III

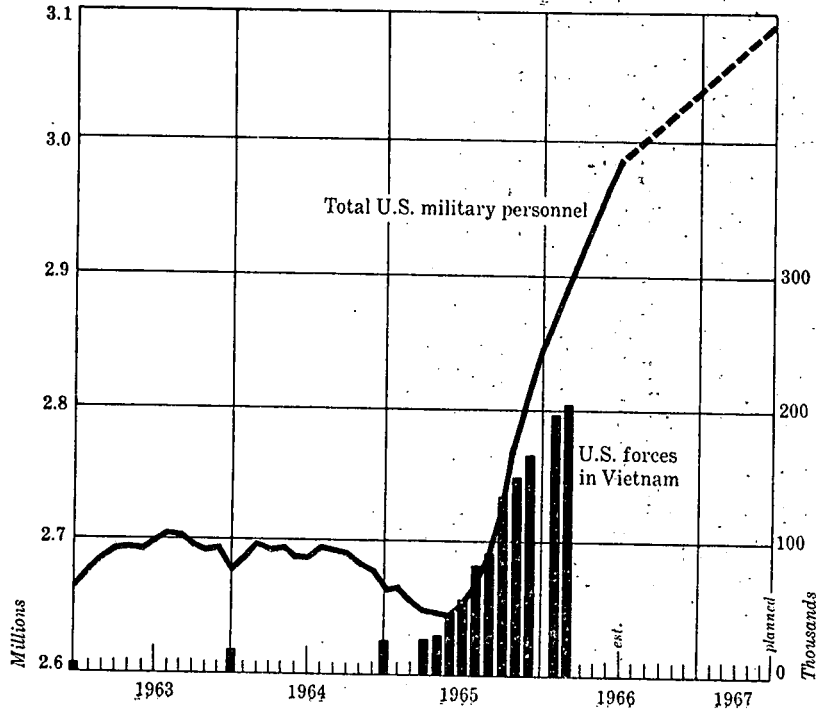
Not until last May was it entirely evident that act II had begun, but there were intimations earlier. In January 1965, after declining for four consecutive quarters, the Federal Reserve Board index of "defense equipment" production turned upward, beginning the precipitous climb depicted at the bottom of the page opposite. In February the United States began bombing targets in North Vietnam.

In March the decline in Army uniformed personnel came to a halt, though the downtrend continued for a while in the other services. In April the U.S. buildup in Vietnam accelerated. In May the administration asked for, and Congress quickly voted, a supplemental fiscal 1965 appropriation of \$700 million. In June the decline in total uniformed military personnel turned into a steep rise.

The Vietnam war is now well along in act III of the budgetary-economic scenario. Since that \$700 million request in May 1965, the administration has asked for \$14 billion in supplemental war appropriations. Soaring orders for ammunition and uniforms have contributed to shortages of copper and textiles for civilian use. So far, however, the costs of the war have been largely channeled into reduced readiness. The war reserve of "combat consumables" has been drawn down. New equipment and spare parts that otherwise would have gone to units elsewhere have been diverted to Vietnam—Iroquois helicopters, for example, that would have gone to the 7th Army in Germany. Fixed-wing aircraft to replace losses in Vietnam have been ordered, but not yet fully delivered and paid for. The war has required only moderate incremental expenditures (that must be understood, however, to mean "moderate" as war expenditures go—a few billion dollars). But as deliveries roll in and the Armed Forces expand, expenditures will begin to catch up with the war's far from moderate costs.

In numbers of U.S. servicemen deployed, the Vietnam war is not as big as the Korean war at its peak. But costs per man run much higher than they did in the Korean war. The pay that servicemen get has gone up more than 40 percent since then. Some materiel costs have risen very steeply since Korea. The F-86D fighters in Korea cost about \$340,000 each; the F-4C's in South Vietnam cost nearly six times as much. Ammunition use per combat soldier is very much higher than in the Korean war. The M-14 rifle fires up to 150 rounds per minute, and 10 rounds per minute at a sustained rate. The M-16, carried by some Special Forces troops, can use up ammunition at a full-automatic rate of 750 rounds per minute. The M-79 grenade launcher fires grenades as if they were bullets.

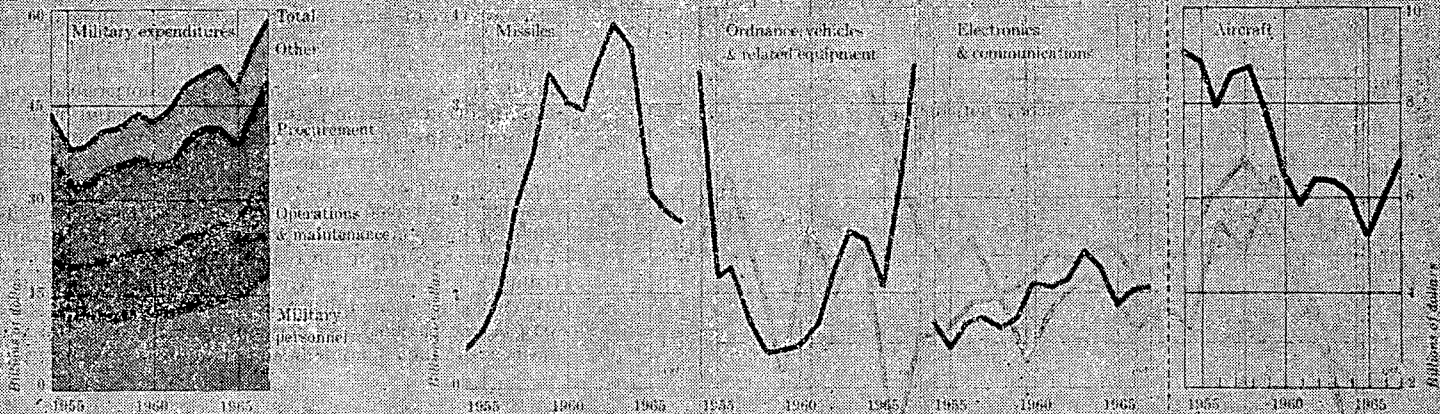
The nature of the war contributes to making it peculiarly expensive for its size. Technologically sophisticated military forces, magnificently equipped to kill and destroy, are inefficiently employed against meager or elusive targets. In Korea, there were visible masses of enemy forces to shoot at, and the U.S. superiority in weapons could be exerted efficiently; in Vietnam the enemy hits and runs, moves under cover of darkness or foliage. With their abundant firepower, the superb U.S. fighting men in South Vietnam clobber the Vietcong in shooting encounters, but the U.S. forces run up huge costs—in troop supplies, fuel, helicopter maintenance—just trying to find some guerrillas that they can shoot at.



*Vietnam Requirements Are
Pushing U.S. Armed Forces over
the Three-Million Level...*

In keeping with Secretary McNamara's long-range plans, the total number of U.S. military personnel shrank in the latter half of calendar 1964, and the shrinkage continued until May, 1965, even after the buildup of U.S. forces in South Vietnam had begun. But after May the military-personnel curve rose steeply. By the end of June, 1967, according to plans already announced, the armed forces will have 452,000 more men than they had at the May low. As the chart shows, far more men have been added to the armed forces since May, 1965, than actually have been sent to Vietnam since then. A main reason for the disparity is that it takes a serviceman outside the theatre of war to support one in Vietnam,

... and Are Also Changing the Composition of Defense Spending ...

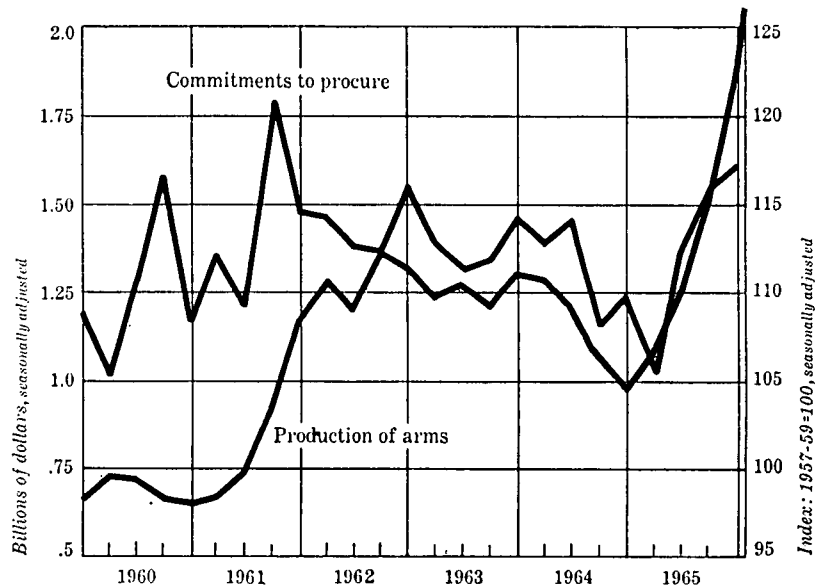


After trending upward from 1956 on, total U.S. military expenditures fell in fiscal 1965, and as the layer chart at left shows, the drop resulted mainly from a decline in procurement; there was also a decline in the "other" category, mainly in spending for research and development and military assistance. The four charts to the right

constitute a closer look at the shift in procurement—a shift away from heavy spending for strategic missiles and toward more for "limited-war" capabilities, especially for "ordnance, vehicles & related equipment." Spending for aircraft, after a ten-year decline, has surged upward as a result of Vietnam.

... While Defense Production Soars

Both lines of this chart show quarterly changes, seasonally adjusted. Arms production as measured by the Federal Reserve Board "defense equipment" index (main components: military aircraft, ordnance, Navy ships) rose during 1961, the first year of McNamara's stewardship, remained on a bumpy plateau in 1962 and 1963, declined in 1964, then moved into a spectacular upswing beginning in the first quarter of 1965. By January, 1966, the index had reached 126 percent of the 1957-59 average, indicating that the Vietnam war has already had a substantial impact on the economy. Contracts normally precede production, and so the commitment line normally moves up (or down) months ahead of the production line, but in 1965 there was an extraordinary switch in this relationship. The reason is that arms production was pushed upward by a surge in precontract "letter contracts" from the Defense Department—a sign of urgency.



FIRING INTO A CONTINENT

There is an almost profligate disparity between the huge quantities of U.S. bullets and bombs poured from the air upon targets in Vietnam and the military and economic damage the bullets and bombs do, in the aggregate. In North Vietnam the United States has debarred itself from attacking economically valuable targets such as port facilities and manufacturing plants. From bases in Thailand, F-105's fly over North Vietnam and drop their mighty payloads on or near roads, rail lines, ferry facilities, bridges. The costs to the enemy of repairing the damage are picayune compared to the costs to the United States of doing the damage. In South Vietnam the guerrillas seldom present concentrated targets. Machineguns mounted on helicopters and on A-47's (elderly C-47's, modified and fitted with three guns) fire streams of bullets into expanses of jungle and brush that are believed to conceal Vietcong guerrillas. The thought of an A-47 firing up to 18,000 rounds per minute into treetops brings to mind that bizarre image in Joseph Conrad's *Heart of Darkness*, of the French warship off the African coast: "There wasn't even a shed there, and she was shelling the bush * * * firing into a continent."

B-52's, operating at a cost of more than \$1,300 per hour per plane, fly a 10-hour round trip from Guam to South Vietnam to strike at an enemy that has no large installations or encampments visible from the air. The B-52's have been fitted with extra racks that increase their payloads to more than sixty 750-pound bombs, about \$30,000 worth of bombs per plane. "The bomb tonnage that is resulting is literally unbelievable," said Secretary McNamara at a Senate hearing last January. Several weeks later, at a press conference, he said: "Our consumption in February * * * of air-delivered munitions alone in South Vietnam was two and a half times the average monthly rate in the 3 years of the Korean war." But much of that "literally unbelievable" bomb tonnage merely smashes trees and blasts craters in the earth.

Only a rich nation can afford to wage war at ratios so very adverse. But the United States *is* a rich nation. If there is a great disparity between the bomb power dropped and the economic value of the targets, there is also a great disparity between the wealth and power of the United States and of the enemy. The cost of the bombs is small in relation to the GNP of the United States, and the damage they do is sometimes substantial in relation to the GNP of North Vietnam, or to the resources available to the Vietcong. But the costs of winning are going to be unpleasantly large.

The official position of the Defense Department is that it does not know what the costs of the war are, and that it does not even try to compute them. As a Pentagon official put it: "We have no intention of cost-accounting the war in Vietnam. Our business is to support the conflict there. Our business is not cost accounting. We have no estimates of costs. It's not practical to say the war has cost x dollars to date."

The Defense Department argues that the war costs are commingled with those of a military establishment that existed before the U.S. troop buildup in South Vietnam began. And that, of course, is true. Still, a meaningful total can be arrived at by analyzing and adding up the various war costs, regardless of whether they translate

immediately into added expenditures. One way or another, we may assume, all costs will result in either added expenditures or reduced readiness, and in the reckoning of the costs it does not matter which, or when, or how.

Fortune's first objective was to arrive at an approximation of annual costs at the early-1966 level of 200 000 U.S. servicemen in South Vietnam. The results of that analysis can serve, in turn, as a basis for calculating costs at higher levels of buildup. In what follows, costs are divided into standard categories—military personnel, operation and maintenance, and procurement—that the Defense Department uses in its budgeting. To outsiders, the department's assignment of expenses to these categories sometimes seems a bit arbitrary. Some clothing is funded under personnel and some under operation and maintenance; ordinary repair parts are funded under O. & M., aircraft "spares" under procurement.

INSIDE AND OUTSIDE THE THEATER

Military personnel. As noted, the fiscal 1966 defense budget, submitted in January 1965, projected a moderate *decline* in total uniformed military personnel ("Active Forces"), from about 2,663,000 at that time to 2,640,000 as of June 30, 1966. Actually, the decline proceeded so briskly that the total got down to 2,641,000 in May 1965. Since then the Defense Department has announced plans to *increase* military personnel to 2,987,000 by next June 30, and to add on another 106,000 by June 30, 1967; by the latter date, the total would be 452,000 above the May 1965 low point. In addition the Department is expanding the civilian payroll by about 100,000 during fiscal 1966, and many of these civilians will take over work previously done by servicemen, freeing them for other duties.

It might appear that these figures could serve as a basis for calculating the personnel costs attributable to the Vietnam war. But it is impossible, without knowing the Defense Department's classified plans and assumptions, to relate the announced personnel increases to any particular force level in South Vietnam. And to have any meaning, statements about the cost of the Vietnam war must be related to specified force levels. Here we are trying to get the cost of the war at a particular level—200,000 U.S. servicemen in South Vietnam. For this reckoning, the war personnel costs may be taken as the combined personnel costs of (1) the 200,000 men in Vietnam, (2) the peripheral supporting forces in southeast Asia, and (3) the required backup forces. The Defense Department defines personnel costs as pay and allowances, subsistence (chow), personal clothing (the "clothing bag" issued to each recruit), plus certain other expenses. Average personnel costs in the armed forces run to \$5,100 per man per year, but the men in South Vietnam get "hostile-fire pay" of \$65 a month, and other war costs boost the average to about \$6,200. So, 200,000 men at \$6,200, or \$1,240,000,000.

The peripheral supporting forces—mainly aboard 7th Fleet ships and at bases in Thailand—numbered at least 50,000 last winter, when the U.S. force level in South Vietnam reached 200,000. That's 50,000 men at \$6,200 a year, or \$310 million.

Each thousand U.S. servicemen stationed overseas under nonwar conditions have on the average about 600 other servicemen backing

them up: trainees, transients, men serving in supply units or performing various auxiliary functions. But it takes far more than 600 men to back up a thousand men deployed in South Vietnam. Additional supply men are required to keep the huge quantities of arms, ammunition, equipment, and supplies moving into the theater of war. The men serving there are rotated home after a 1-year tour (a 3-year tour is normal for U.S. forces in Western Europe), and additional trainees are needed to support the rotation. Extra backup men are needed, also, to make up for the erosion resulting from deaths, severe injuries, and tropical ailments. In the course of a month, large numbers of men spend some days or weeks in transit to or from South Vietnam. And additional men in training require additional men to train them. With all the additions, it works out that there is a ratio of one to one, or 1,000 to 1,000, between servicemen in the theater of war and servicemen outside the theater but assignable to the war as elements of cost.

For the 250,000 men in Vietnam and vicinity, then, there will be 250,000 others elsewhere. Since some of these are new recruits, the average personnel cost is taken to be only \$4,700. That makes another \$1,175,000,000, bringing total personnel costs to \$2,725,000,000:

KEEPING THEM FLYING

Operation and maintenance. This category is even more capacious than its name suggests. It includes everything that does not fall into other categories—recruitment, training, medical care, repairs, operation of supply depots, transport of goods, and, in the official expression, "care of the dead". A great many of those additional civilians hired by the Defense Department in the last several months are working in O. & M.

In fiscal 1965, O. & M. for the entire Armed Forces averaged out to \$4,630 per man. For 500,000 men that would come to \$2,315,000,000. But the Vietnam war entails extraordinary O. & M. expenses. Planes there fly a lot more hours per month than they normally do, and the extra O. & M. involved in keeping them flying runs at a rate of more than \$200 million a year. Extra repair and maintenance are required to keep vehicles moving and equipment working. An enormous logistic flow must be coped with—more than 700,000 tons a month. The shipping costs to Vietnam amount to \$225 million at a yearly rate. Combat clothing gets ripped up in the bush, deteriorates rapidly in the moist tropical heat. And, of course, extra medical care per man is needed in a tropical war. When all the extra O. & M. costs involved are added together, the total, by a conservative reckoning, comes to \$1 billion. That brings the over-all O. & M. costs to \$3,315,000,000.

Procurement, i.e., materiel costs. As reckoned here, these are taken to be the chewup in the war zone rather than the additional procurement resulting from the war. Ammunition and aircraft losses together account for more than 75 percent of materiel costs, and for both categories the costs can be calculated with some statistical precision.

McNamara reported last January that U.S. ground forces in South Vietnam, including Army and Marine helicopter units, were "consuming ammunition at the rate of about \$100 million per month," and that U.S. air forces were using up "air munitions" (mostly

bombs) at a rate of about \$110 million per month. That works out to a combined rate of \$2.5 billion a year. At that time there were about 190,000 U.S. servicemen in South Vietnam, so for the calculation of costs at the 200,000-man level, the figure has to be adjusted upward a bit, to \$2,650,000,000.

In testifying at congressional hearings, McNamara and other Defense Department witnesses furnished numerous bits of information about U.S. aircraft operations in the Vietnam war, including losses in 1965 and numbers of sorties over various periods (one flight by one plane counts as one sortie). Sorties per month increased dramatically during 1965, and despite low loss rates per 1,000 sorties, losses added up to large numbers over the course of the year: 275 fixed-wing aircraft lost as a result of "hostile action" alone, and 177 helicopters lost, 76 as a result of "hostile action," 101 in accidental crashes and other mishaps. Assuming continuation of 1965 ratios between sorties and losses, estimated annual attrition at a 200,000-man force level works out, in rounded figures, like this:

475 fixed-wing tactical planes, at \$1,800,000-----	\$855, 000, 000
165 other fixed-wing planes (transport, observation), at \$200,000_	33, 000, 000
320 helicopters, at \$250,000-----	80, 000, 000
Total-----	968, 000, 000

A figure for aircraft spares was arrived at by first calculating total flying costs of the aircraft operations (information on average flying costs per hour for various types of military aircraft is available). That came to \$800 million a year. Spares represent, on average, 20 percent of flying costs, which comes to \$160 million. With the addition of a minimal \$25 million to allow for spares required to repair planes hit by enemy fire, the total for aircraft spares comes to \$185 million.

Little information is available about materiel chewup, apart from ammunition and aircraft. In the absence of direct evidence, however, Defense Department procurement orders provide a basis for rough estimates. It is assumed—and this is a bit of a leap—that the annual attrition of weapons, vehicles, and equipment is equivalent to one-third of the increase in procurement orders in those categories (as measured by the increase in prime contract awards from the second half of 1964 to the second half of 1965). From that procedure emerges a round figure of \$600 million for attrition of hard goods other than aircraft, ammunition, and ships (in effect, ship losses are assumed to be zero). That brings total procurement to \$4.4 billion.

The three categories together—military personnel, O. & M., procurement—add up to \$10,440,000,000. That is the approximate annual cost of the U.S. operations in the Vietnam war at the 200,000-man level reached early this year. To that figure must be added support for South Vietnamese military forces. (For fiscal 1967, military assistance to South Vietnam will be included in the defense budget.) Counting supplemental requests, total military aid to South Vietnam comes to more than \$1 billion in the current fiscal year. In the early 1960's, military aid to South Vietnam ran to something like \$100 million a year; the \$900 million difference can be considered a Vietnam war cost. In addition, the United States pays \$50 million to help support South Korean forces in South Vietnam.

Much of the \$1.4 billion that Congress has appropriated in fiscal 1966 for military construction in southeast Asia has to be counted as part of the Vietnam war cost. According to Secretary McNamara's testimony at a Senate hearing, all of the contemplated construction "is associated with the operations in South Vietnam." Some of the facilities may have military value to the United States after the war is over, but it seems reasonable to suppose that at least \$1 billion of the planned construction would not have been undertaken had it not been for the war. If that is spread over 2 years, construction adds \$500 million a year to the cost of the war.

That brings the grand total to \$11.9 billion a year. This figure does not allow for an important deferred cost, depreciation of equipment. Since the Defense Department does not pay taxes or operate in terms of profit and loss, the business-accounting concept of depreciation is hard to apply, but the wearing out of equipment is a reality whether it is cost-accounted or not. This wearout is a separate cost from the additional maintenance and repair required to keep planes and ground equipment operating in the Vietnam war. Tactical planes and Military Airlift Command planes involved in the war are flying 60 percent more hours per month than they normally do in peacetime, and even with extra maintenance their useful lives are being shortened. The consequences will show up in future defense budgets.

In addition, the war imposes substantial nonmilitary costs that are not included in the \$11.9 billion (or in the other war-cost figures that follow). U.S. economic aid to South Vietnam, for example, leaped from \$269 million in fiscal 1965 to \$621 million in the current year.

MORE MEN FOR PATROL, SEARCH, PURSUIT, ATTACK

The \$11.9 billion may be taken as the annual military cost of sustaining the war with 200,000 U.S. servicemen in South Vietnam—the level reached around February 1. Given that yardstick, it is a relatively simple matter to cost out the present level (about 235,000 in South Vietnam). It can be assumed that costs have increased since February in direct proportion to the buildup, except that construction costs and military aid to South Vietnam remain unchanged. So calculated, the current cost works out, at an annual rate, to \$13.7 billion—the "more than \$13 billion" mentioned at the beginning of this article.

Efforts to project costs at very much higher levels of buildup run into some uncertainties. Costs at the 400,000-man level—the level General Westmoreland is reportedly aiming for by the end of this year—would not be double those at 200,000. For one thing, the expansion of U.S. forces will itself tend to alter the character of the war. Indeed, it has already. The widening U.S. superiority in firepower forced the enemy to cut down on direct assaults by battalions and regiments and revert pretty much to guerrilla warfare. As the number of GI's in South Vietnam increases, the forces needed to guard the coastal enclaves will not have to increase proportionately, so a larger percentage of the total combat-battalion strength will be available for patrol, search, pursuit, and attack operations. Some costs, as a result, will increase faster than the number of U.S. service-

men in South Vietnam—e.g., *Fortune* has assumed a 5-percent increase in the rates of ground and helicopter ammunition use per 100,000 men.

But in some respects costs would not nearly double as we built up to 400,000. The existing construction plans, for example, provide for port facilities, roads, and installations beyond current requirements. Costs of supporting South Vietnamese forces would not double either—South Vietnam's military and paramilitary forces already number about 600,000 men, and an increase of even 50 percent could not be squeezed out of a total population of 16 million. (An increase to 670,000 has been announced, however, and some upgrading of the military equipment and supplies furnished by the U.S. will undoubtedly occur.) Bombing and tactical air support operations would probably not double either: lack of runways would prevent that large an expansion.

In *Fortune's* calculation it was assumed that the 100 percent increase in U.S. servicemen in South Vietnam, from 200,000 to 400,000, would be accompanied by these less than proportionate increases:

- 50 percent in bombing and tactical air-support operations;
- 10 percent a year in construction costs;
- 15 percent in military aid to South Vietnam.

On these exceedingly conservative assumptions, the costs at 400,000 come to the resounding total of \$21 billion a year.

To calculate Vietnam war costs during fiscal 1967 it is necessary to make some assumptions about the pace of the buildup. *Fortune* assumed that U.S. forces in South Vietnam would increase to 250,000 men by this June 30, expand steadily to reach 400,000 as of December 31, and then remain at that level. On this basis the prospective Vietnam war costs during fiscal 1967 work out to \$19.3 billion.

USED-UP OPTIONS

The \$58.3 billion defense budget for fiscal 1967 includes, by official reckoning, \$10.3 billion in expenditures resulting from the Vietnam war. With a buildup to 400,000 in fiscal 1967, war expenditures during the year would greatly exceed this figure, but would not necessarily boost total defense spending as much as \$9 billion. For one thing, Secretary McNamara can cut somewhat further than he already has into programs not directly connected with the war.

But not very far; McNamara's options for deferring expenditures in fiscal 1967 have been pretty well used up. The 1967 defense budget shows a total of \$1.5 billion in cutbacks in military construction, strategic-missile procurement, and other non-Vietnam programs. In view of McNamara's economizing in recent years, there cannot be much leeway left for deferrals. The Secretary himself said not long ago that in shaping the 1967 budget he had deferred "whatever can be safely deferred," which suggests that there is *no* leeway any more.

He has also largely used up the options for restraining expenditures by drawing down inventories and reducing trained forces outside the war theatre. McNamara has vigorously insisted that "we have a great reservoir of resources," and he is undoubtedly right about that, especially if "a great reservoir" is interpreted to include the potential capacity of the U.S. economy to produce military goods. But he has overstated his case by arguing, in effect, that the Vietnam war has not reduced readiness at all ("* * * far from overextending ourselves,

we have actually strengthened our military position"). Counting peripheral supporting forces, the United States now has about 300,000 men deployed in the Vietnam war theater, and (in keeping with that 1-to-1 ratio) another 300,000 men are committed to backing them up. That makes 600,000 men unavailable for other contingencies. Since the low point in May 1965, U.S. military manpower has increased by approximately 400,000 (this figure allows for substitution of civilians for uniformed personnel), and a lot of those 400,000 are men still in training. It would be remarkable indeed if all this had somehow "strengthened our military position."

Nor is there much left to draw down in military inventories. As shown in the middle row of charts on pp. 506-8, Defense Department expenditures for procurement declined sharply in fiscal 1965—by \$3.5 billion, in fact. This decline in procurement apparently contributed to the Army shortages (of repair parts, communication equipment, helicopters, and trucks, among other things) discovered early last year by investigators of the U.S. Senate's Preparedness Investigating Subcommittee, headed by Mississippi's Senator John Stennis. Pentagon witnesses tried to explain that the "shortages" were mere routine gaps between reality and ideal tables of equipment. But at one point South Carolina's Senator Strom Thurmond pinned down two Pentagon generals in this exchange:

Senator THURMOND. You have not denied those shortages, have you, General Abrams?

General ABRAMS. No.

Senator THURMOND. And you have not, General?

General CHESAREK. No.

Senator THURMOND. You do admit the shortages?

General CHESAREK. Yes, sir.

The combination of rising Vietnam requirements and thin, declining inventories led last year to surges in military production and orders *far beyond what can be inferred from the official estimates of expenditures attributable to the Vietnam war*. In the second half of calendar 1965, Defense Department prime contract awards ran \$3.3 billion ahead of the corresponding period of 1964—\$6.6 billion at an annual rate. In contrast, the Defense Department estimates fiscal 1966 *expenditures* for the Vietnam war at only \$4.6 billion. Anyone trying to catch an intimation of things to come might do well to keep an eye on *orders*, rather than expenditure estimates. Orders are for real: if you want the stuff delivered in time, you've got to order it in time. But expenditure estimates are not binding upon anybody.

TRYING TO AVOID THE PILE-UP AT THE END

Since they are not for real, budgetary expenditure estimates are an exceedingly unreliable guide to the future. A better guide can be found in requests for *appropriations*. For the fiscal years 1966 and 1967 combined, the Defense Department has estimated Vietnam war expenditures at \$15 billion, but for the same 2 fiscal years the department has already requested approximately \$23 billion in Vietnam war appropriations.

Big as they look, however, these requests for war appropriations will almost certainly be added to long before the end of fiscal 1967. That probability can be inferred from on-the-record statements by Secretary McNamara and other Defense Department witnesses at congressional hearings.

The Defense Department has based its requests for war appropriations not upon a forecast of what will actually happen in the Vietnam war, but upon what a Pentagon official calls "calculated requirements." In calculating the "requirement" for any procurement item, the department considered the lead time—how far ahead you have to order the item to have it when you need it. For complex or precisely tooled military hardware, lead times may run to a year or more, and for such items—particularly aircraft and aircraft spares—the department allowed fully for expected losses and use-up to the end of fiscal 1967. But for items with shorter lead times, requirements were calculated tightly, on the assumption that later on they could be revised and McNamara could ask for supplemental appropriations.

Supplemental appropriations have come to be viewed as natural in wartime. And McNamara's policy of asking for funds "at the last possible moment," as he puts it, has its merits. By following that policy he hopes to avoid "overbuying" and any pileup of surplus materiel at the end of the war. (When the Korean war ended, the Military Establishment had billions of dollars worth of excess goods in stock or on order.) But the policy implies that the Defense Department will have to ask for more funds before the end of fiscal 1967 unless there is some unexpected abatement in the war.

Of necessity, the 1967 defense budget was constructed upon working assumptions about how big the war will get and how long it will last, and given all the uncertainties, these cannot be expected to coincide with the realities. In estimating expenditures and appropriations for fiscal 1967, the Defense Department assumed that U.S. "combat operations" in Vietnam will not continue beyond June 30, 1967. In keeping with that assumption, the 1967 budget does not provide funds for orders of aircraft or other military goods to replace combat losses after that date. Here again the assumption implies that the Defense Department will need supplemental appropriations in fiscal 1967 if the war continues at even the present rate.

McNamara has not said in public what U.S. force level in South Vietnam is allowed for in the 1967 budget, and the explanations he has offered at congressional hearings have been deleted by Pentagon censors. But at a Senate hearing in January, Gen. John P. McConnell, the Air Force Chief of Staff, indicated that, for the Air Force at least, the appropriations requested so far allow for little or no expansion of the war beyond the 200,000-man level. Said McConnell in reply to a question concerning the adequacy of the funds requested: "We don't have any problem if the war continues at about the same rate as now, Mr. Chairman."

These budgeting assumptions expressed and implied by McNamara and other Pentagon witnesses lead to a strong inference: by next January, if the war continues unabated until then at even the present rate, the Defense Department will have to ask for supplemental appropriations for long-lead-time items required in fiscal 1968 and shorter leadtime items required in the last months of fiscal 1967. Some months before next January, indeed, perhaps this summer, the department will have to begin ordering very long leadtime items in anticipation of fiscal 1968 combat losses.

MOUNTING ASTONISHMENT AT THE BAD NEWS

It follows that if the U.S. buildup in South Vietnam proceeds to a much higher level, the supplemental requests will run into many billions before the end of fiscal 1967. And since the Military Establishment will have to procure a lot of additional equipment and supplies and bring in a lot of additional men, defense expenditures will rise billions of dollars above the estimate submitted last January.

So the 1967 budget barely begins to suggest the level of Vietnam war spending that probably lies ahead. The budget is not misleading once its rather sophisticated underlying assumptions are understood; but the assumptions are *not* widely understood, and the administration has not made much of an effort to see that they are. There is likely to be mounting astonishment this year and next as the bad news about the war's costs and the implied message about taxes and inflation sink in. It's a good bet that Americans will still consider the war worth winning. There is no reason for them not to know its cost.

BUDGET POLICY IN A HIGH-EMPLOYMENT ECONOMY

The Federal budget for fiscal 1967,¹ presented to Congress on January 24, provided for substantial increases in both expenditures and revenues during the remainder of fiscal 1966 and for further increases in fiscal 1967. According to the administration's budget plan, the excess of expenditures over revenues (i.e., the deficit) is expected to increase from fiscal 1965 to 1966 and then to decline in fiscal 1967.

This article focuses on the implications of the Federal budget for economic stability in calendar 1966. To assist in the analysis, several alternative measures of budget policy are examined, and some economic principles are reviewed. Prospects for Federal taxes and expenditures may be substantially different now from what they were when the budget was prepared. Nevertheless, it is believed that this article, based on the January budget report, will promote understanding of the budget plan in light of the current economic environment.

MEASURES OF BUDGET POLICY

The fiscal activities of the Federal Government can be summarized in several ways. Some alternative budget concepts and the relationships between them are discussed in the following sections.² Table I provides a reconciliation of these budget concepts, with data for fiscal 1965-67 used for illustration.

¹ The Federal Government's fiscal year runs from July 1 to June 30 and is designated by the calendar year in which it ends.

² The term "budget" is used loosely here. There is in fact only one Federal "budget" in the sense of a financial plan, and that is the administrative budget. All other "budgets" discussed here are summary statements of receipts and expenditures classified in various ways for purposes other than administrative planning.

TABLE 1.—*Reconciliation of various measures of Federal receipts and expenditures*
 [In billions of dollars]

	Fiscal year—		
	1965 actual	1966 estimate	1967 estimate
RECEIPTS			
Administrative budget receipts.....	93.1	100.0	111.0
Plus: Trust fund receipts.....	31.0	33.5	41.6
Less:			
Intragovernmental transactions.....	4.3	4.5	5.5
Receipts from exercise of monetary authority.....	.1	.9	1.6
Equals: Federal receipts from the public.....	119.7	128.2	145.5
Less: Cash transactions excluded from Federal receipts account (District of Columbia, financial transactions, etc.).....	1.0	.6	.7
Plus: Items added to Federal sector account but not in cash receipts (netting differences, timing differences, etc.).....	.9	1.2	-2.6
Equals: Federal receipts, national income accounts.....	119.6	128.8	142.2
Plus: Adjustment for tax receipts because of deviation of economy from high employment.....	5.9	2.0	.5
Equals: High-employment receipts.....	125.5	130.8	142.7
EXPENDITURES			
New obligational authority.....	106.6	126.0	121.9
Plus: Authorizations enacted in prior year but spent in current year.....			30.7
Less: Expenditures to be made in future years.....			39.8
Equals: Administrative budget expenditures.....	96.5	106.4	112.8
Plus: Trust fund expenditures.....	29.6	33.8	37.9
Less:			
Intragovernmental transactions.....	4.3	4.5	5.5
Debt issuance in lieu of checks and other adjustments.....	-6	7	.2
Equals: Federal payments to the public.....	122.4	135.0	145.0
Less: Cash transactions excluded from Federal expenditures account (District of Columbia, financial transactions, etc.).....	5.8	4.0	1.6
Plus: Items added to Federal sector account but not in cash payments (netting differences, timing differences, etc.).....	1.7		-7
Equals: Federal expenditures, national income accounts.....	118.3	131.0	142.7
Plus: Adjustment for expenditures because of deviation of economy from high employment.....	-2	-2	.2
Equals: High-employment expenditures.....	118.1	130.8	142.9
SURPLUS OR DEFICIT			
Administrative budget.....	-3.4	-6.4	-1.8
Cash budget.....	-2.7	-6.9	+5
National income accounts budget.....	+1.2	-2.2	-5
High-employment budget.....	+7.4	0	-2

Sources: *The Budget of the United States Government for the Fiscal Year Ending June 30, 1967*, pp. 47, 377, and Federal Reserve Bank of St. Louis.

ADMINISTRATIVE BUDGET

The administrative budget is the basic planning document of the Federal Government; covering receipts and expenditures of funds that it owns. Its main purpose is to serve as a guide to executive and legislative program planning, review, and enactment. Those agencies for which Congress makes regular appropriations are included in the administrative budget; activities of trust funds (social insurance, highway, etc.), quasi-public agencies (e.g., Federal home loan banks), and self-financing agencies are excluded.

Expenditures and receipts are generally recorded on a cash basis, i.e., on the date of actual receipt or payment. Interest expense is on an accrual basis.

CASH BUDGET

The consolidated cash budget is a summary statement of cash flow between the Federal Government and other sectors of the economy. Included are activities of the regular Government agencies found in the administrative budget plus the activities of trust funds and Government-sponsored agencies. Because activities of some agencies (e.g., the post office) are recorded on a net basis, the full magnitude of cash flows between the Federal Government and other sectors of the economy is not measured by the cash budget.

The cash surplus or deficit serves as a measure of the direct impact of Federal Government spending and taxation on the financial assets of the private sector of the economy (including State and local governments). Surpluses or deficits in this budget indicate changes in the public debt and/or changes in the Treasury's cash balance.

NATIONAL INCOME ACCOUNTS BUDGET

Federal Government activities in the national income accounts are restricted to receipts and expenditures which reflect the direct impact of Federal spending and tax programs on the flow of current income and output. This measure is obtained by making two major adjustments in the cash budget.

First, capital transactions adjustments exclude expenditures on existing assets and loans (or loan repayments). Second, timing adjustments are made. Expenditures are recorded when delivery is made to the Government (whereas the cash budget records spending at the time of payment). Tax receipts are recorded when the tax liability is incurred (whereas the cash budget records them when collected).

HIGH-EMPLOYMENT BUDGET

The high-employment budget is an estimate of expenditures and revenues in the Federal sector of the national income accounts for a level of high employment.³ It is an attempt to correct the distortion introduced by the impact of the economy itself (through the effect of changing levels of economic activity on Government expenditures and tax receipts) on the realized surplus or deficit. The smaller the surplus or greater the deficit in this budget, the more stimulative is the impact of Federal fiscal activities and the less is the dependence on private demand to maintain high employment.

NEW OBLIGATIONAL AUTHORITY

In evaluating the impact of the Federal Government on the economy, another measure of particular importance is "new obligational authority." This is legislation by Congress permitting a Government agency or department to commit or obligate the Government to certain expenditures. Congress does not vote on expenditures; it determines new obligational authority. Before funds can be spent, an agency must submit and have approved by the Bureau of the

³ The President's Council of Economic Advisers defines a high-employment level of economic activity as that level associated with a 4 per cent unemployment rate. The high-employment budget could be computed for other budget concepts, but, for an analysis of the economic impact of the budget, the national income accounts basis seems most appropriate. For a description of techniques and procedures for calculating high-employment budget estimates, see Nancy H. Teeters, "Estimates of the Full-Employment Surplus, 1955-1964," *The Review of Economics and Statistics*, XLVII (August 1965), 309-321.

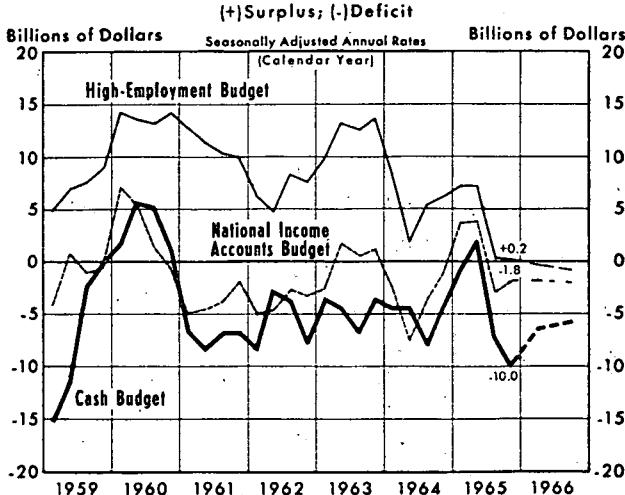
Budget an apportionment request. This determines the rate at which obligational authority can be used. An agency usually incurs obligations, i.e., commits itself to pay out money, after apportionment by the Bureau of the Budget.

Incurring obligations does not necessarily mean immediate cash expenditures. When the Government buys goods and services produced by the private sector, the lag of expenditures behind obligations may be substantial. In the case of items not usually kept in inventory, like military hardware, it usually takes time for private producers to draw plans, negotiate subcontracts, produce and deliver the product.

BUDGET POLICY IN FISCAL 1966-67: FACTS AND FIGURES

Budget plans for future months indicate marked increases in both expenditures and receipts. This obtains for any one of the four major budget measures discussed above. Generally, according to the budget plan, deficits will become larger in fiscal 1966 compared with fiscal 1965, then turn toward surplus in fiscal 1967 (table I).

U.S. Government Fiscal Operations



Sources: U.S. Treasury Department, Council of Economic Advisers, Board of Governors of the Federal Reserve System, and Department of Commerce
 Latest data plotted: 4th quarter 1965 preliminary
 1st and 2nd half 1966 estimated by Federal Reserve Bank of St. Louis

OBLIGATIONAL AUTHORITY

New obligational authority (table II) jumps to an estimated \$126 billion in fiscal 1966 from \$106.6 billion in fiscal 1965. Included in this \$19.4 billion increase is \$11.4 billion for defense, international, and space and \$4.6 billion for health, education, welfare, and related programs.

TABLE II.—Changes in Federal spending and obligational authority

[In billions of dollars]

	Fiscal 1965 to fiscal 1966	Fiscal 1966 to fiscal 1967
Cash payments to the public:		
Defense, international, and space.....	+6.6	+4.0
Domestic.....	+6.0	+6.0
Health, education, welfare, and community development.....	+7.7	+4.9
Interest on public debt.....	+7	+9
Other.....	-2.4	+2
Total.....	+12.6	+10.0
New obligational authority:		
Defense, international, and space.....	+11.4	-4.1
Domestic.....	+8.0	
Health, education, welfare, and community development.....	+4.6	+1.0
Interest on public debt.....	+7	+8
Other.....	+2.7	-1.8
Total.....	+19.4	-4.1

Source: *The Budget of the United States Government for the Fiscal Year Ending June 30, 1967*, pp. 41, 439.

Projections for fiscal 1967 are for a decrease in obligational authority to \$121.9 billion, reflecting a decline of \$4.1 billion for defense, international, and space.⁴ Obligational authority for all domestic civilian programs is expected to be unchanged from fiscal 1966 to 1967.

EXPENDITURES

The pattern of Federal cash payments in fiscal 1966 and 1967 is quite different from that of obligational authority. Payments are estimated at \$135 billion in fiscal 1966 and \$145 billion in fiscal 1967 compared with \$122.4 billion in fiscal 1965.

Expenditures are projected to increase in fiscal 1967 but by a smaller amount than in fiscal 1966. Defense, international, and space spending is expected to increase \$4 billion, while domestic civilian spending is scheduled to rise by \$6 billion.

Reflected in the expenditure totals for fiscal 1966 and 1967 is a proposed substitution of private for public credit. The proposal involves asset sales of \$3.3 billion in fiscal 1966 and \$4.7 billion in fiscal 1967 compared with \$1.6 billion in fiscal 1965.⁵ These asset sales are to include mainly pooled loans of several Federal agencies (Export-Import Bank, Federal National Mortgage Association, and the Veterans' Administration). Because such sales are netted against expenditures in the Government's accounting system, actual outlays stated in the budget are understated by the amount of asset sales.

The discrepancy between changes in new obligational authority and cash payments to the public from fiscal 1966 to fiscal 1967 implies that the pool of authorized but unspent funds will be built up in fiscal 1966, then drawn down in fiscal 1967. This conclusion rests on the assumption that there will be no supplemental appropriations required for Vietnam.

⁴ Note that there is a decline because obligational authority is extraordinarily high in fiscal 1966, reflecting large supplemental appropriations for financing the war in Vietnam.

⁵ There is some indication that asset sales will fall short of budgeted totals in fiscal 1966. A sale of Export-Import Bank participation certificates in February totaled \$360 million out of \$700 million offered.

RECEIPTS

Federal cash receipts are estimated to rise sharply, especially from fiscal 1966 to 1967. Increases in receipts for fiscal 1966 reflect mainly growth in the economy, while collections in fiscal 1967 are expected to reflect changes in tax laws as well as growth.

Cash receipts in fiscal 1966 are expected to be \$128.2 billion, up \$8.5 billion from fiscal 1965. This increase (table III) reflects the excise tax cut in the summer of calendar 1965, restoration of excise taxes on automobiles and telephone service in the first half of calendar 1966, speedup of corporate and individual income taxes early in calendar 1966 and the social security tax increase that went into effect on January 1, 1966. The net effect of these and other minor tax changes is expected to be an increase of \$9 billion in receipts. The bulk of the remaining \$7.6 billion increase in receipts can be explained by growth in the economy.

TABLE III.—Changes in Federal receipts

[In billions of dollars]

	Fiscal 1965 to fiscal 1966	Fiscal 1966 to fiscal 1967
Changes due to changes in tax law:		
Excise tax reduction	-1.8	-1.2
Reimposed excise taxes	+1	+1.2
Individual income tax speedup	+1	+4
Corporate income tax speedup	+1.0	+3.2
Social security tax increase	+1.6	+5.2
Social security tax speedup (self-employed)	+1	+1
Other tax changes	-.2	
Total	+8.9	+8.9
Changes due to growth in economy and other factors ¹	+7.6	+8.4
Total change in receipts	+8.5	+17.3

¹ Includes receipts from estate and gift taxes, customs, other miscellaneous sources (e.g., sales of Government property), trust fund receipts from sources other than social security and excise taxes, and adjustments for intragovernmental transactions.

Source: Estimated by Federal Reserve Bank of St. Louis from the *Budget of the United States Government for the Fiscal Year ending June 30, 1967*.

The tax program designed for fiscal 1967 is somewhat different from that for fiscal 1966. Receipts are expected to rise by \$17.3 billion. Changes in tax legislation, primarily a speed-up of corporate tax collections and an increase in social security tax rates scheduled for January 1, 1967, are expected to provide over half of the increase. The restoration of auto and telephone excise taxes has the effect of offsetting the decline in collections that would have been experienced in the absence of legislation. Continued growth in the economy is expected to provide the bulk of the remaining \$8.4 billion increase.

SUMMARY

Federal budget expenditures and receipts are both estimated to rise sharply in the 18-month period ending June 30, 1967. The cash budget deficit is expected to increase in fiscal 1966 but turn toward surplus in fiscal 1967. The basis for such a projection lies in an estimate of expected increases in receipts, mainly from increased social security tax collections and growth in the economy. In addition, certain "one-shot" proposals—tax speedup and sales of financial

assets—will have the effect of reducing the deficit, especially in fiscal 1967.

BUDGET POLICY IN CALENDAR 1966: ECONOMIC EFFECTS

The above facts and figures on the Federal budget have important implications for economic stability in coming months. To assist in the understanding of these implications, some basic principles of economic analysis are reviewed. This framework is then used to analyze the administration's fiscal plans within the economic setting expected in calendar 1966.

The following section presents a theoretical framework for analyzing the effects of the Federal budget on the level of economic activity. Also, the terminology used in later sections of this article is introduced here. The reader who is not interested in the analytical framework may proceed directly to the next section, "Economic Setting."

ANALYTICAL FRAMEWORK⁶

The level of economic activity is determined by the saving and spending propensities of households, businesses, governments, and foreigners.⁷ The most comprehensive measure of economic activity is gross national product (GNP)—the total value of final goods and services produced in a given time period. GNP can be measured by summing all expenditures or by summing all incomes. All production can be thought of as being bought; thus, the total product can be measured by gross national expenditure (*GNE*) on this product. Similarly, all production has income charges against it equal in value to what is produced; thus, the total product can be measured by gross national income (*GNY*). This definitional relationship between total product, total expenditure, and total income can be expressed as follows (where triple bar, \equiv , means "identically equals"):

$$(1) \text{GNP} \equiv \text{GNE} \equiv \text{GNY}$$

Gross national expenditure (*GNE*) can be divided into its major components—consumption (*C*), investment (*I*), and government purchases (*G*). Gross national income (*GNY*) must be allocated to consumption (*C*), savings (*S*), and taxes (*T*). Equation (1) can be rewritten, expressing *GNE* and *GNY* as the sum of their components:

$$(2) C + I + G \equiv C + S + T$$

where:

- C* = personal consumption expenditures;
- I* = gross private investment;
- G* = government purchases of goods and services;
- S* = gross private saving;
- T* = net government receipts.

Both *GNE* and *GNY* contain consumption (*C*). As a part of *GNE*, consumption is spending on consumer goods and services. As an allocation of *GNY*, consumption is that portion of income spent on

⁶ This section draws heavily from Robert Solomon, "A Note on the Full Employment Budget Surplus," *The Review of Economics and Statistics*, XLVI (February 1964), 105-108.

⁷ All terms are defined so as to be consistent with the national income accounts framework. Investment is defined to include gross private domestic investment and net foreign investment; private saving includes both personal and business saving; government purchases are for Federal, State, and local governments and net government receipts are essentially taxes net of transfer payments.

consumer goods and services. Both statements refer to the same magnitude. For convenience, consumption (C) can be ignored, and attention focused on the remainder of $GNE(I+G)$ and the remainder of $GNP(S+T)$. Dropping consumption (C) from both sides of equation (2) leaves:

$$(3) I+G \equiv S+T.$$

Government expenditures (G) can be netted against receipts (T), yielding government saving ($T-G$). The resulting expression shows that investment (I) is identically equal to total savings [$S+(T-G)$]:

$$(4) I \equiv S+(T-G).$$

In an accounting sense, saving and investment are always equal, regardless of the level of GNP. However, accounting definitions of saving and investment do not themselves provide an explanation of the dynamic forces that cause GNP to be what it is. Nevertheless, the concepts are useful in developing a framework for understanding what determines GNP.

Although *measured* saving and investment are always equal, *planned* saving and investment are not. Saving and investment are performed largely by different groups; each group is motivated by its own set of considerations. An attempt by businesses to invest more than is willingly saved by households, businesses, and governments sets in motion forces causing GNP to increase. Under such circumstances injections of investment expenditures into the income-expenditure stream exceed the leakages of private and government saving from it. An excess of injections over leakages leads to an increase in GNP. The rise in GNP continues to a level where planned saving and investment are brought into balance.

Whether an economy achieves high employment with stable prices (i.e., an optimal GNP)⁸ depends on the relation between planned saving and investment at that specified level of economic activity. If investment falls short of planned saving at high employment, GNP will fall short of its optimal level and unemployment will result. On the other hand, if planned investment exceeds planned saving at high employment, GNP will exceed its optimal level and prices will rise. In terms of equation (4) these conclusions may be summarized as follows (where the subscript H denotes "high-employment value"):

<i>Relation between planned saving and investment at high employment</i>	<i>Result</i>
I_H less than $S_H+(T_H-G_H)$	GNP falls short of its optimal level
I_H equals $S_H+(T_H-G_H)$	GNP achieves its optimal level
I_H greater than $S_H+(T_H-G_H)$	GNP exceeds its optimal level

Understanding why GNP exceeds or falls short of its optimal level is crucial to the policy formulation process. Within the analytical framework discussed above, the problem reduces to an analysis of the discrepancy between high-employment values of saving and investment. If a discrepancy exists, policy measures can be instituted which will restore GNP to its optimal level.

⁸ This discussion ignores possible inconsistencies between high employment and stable prices. Choice of an optimal GNP probably involves a "tradeoff" between an increase in employment and a rise in the general level of prices.

To make the saving-investment framework operationally useful for policy formulation purposes, it is helpful to make certain assumptions. Private saving (S) and net Government receipts (T) are quite predictably related to GNP, and their values can be estimated for an optimal level of GNP, Investment (I) and government spending (G) are not so predictably related. Investment is subject to numerous influences in addition to the level of GNP, an important one being monetary actions. Government spending is largely determined by noneconomic elements, especially of a political character. Thus, we may assume that planned high-employment levels of investment and Government spending are approximated by their observed values. In terms of the algebra, the H subscript is dropped from I and G .

With these assumptions, we may (1) state the appropriate magnitude of government saving ($T_H - G$) needed to achieve optional GNP, given the relation between actual investment and planned high-employment private saving ($I - S_H$), or (2) state the amount of investment needed to close the high-employment savings-investment gap ($I - S_H$), given the magnitude of government saving ($T_H - G$). The first interpretation indicates the fiscal actions required to achieve optimal GNP, given monetary actions; the latter specifies the required monetary actions as they influence investment, given fiscal actions.

By regrouping equation (4) and denoting high-employment values, these interpretations of the saving-investment framework can be summarized as follows:

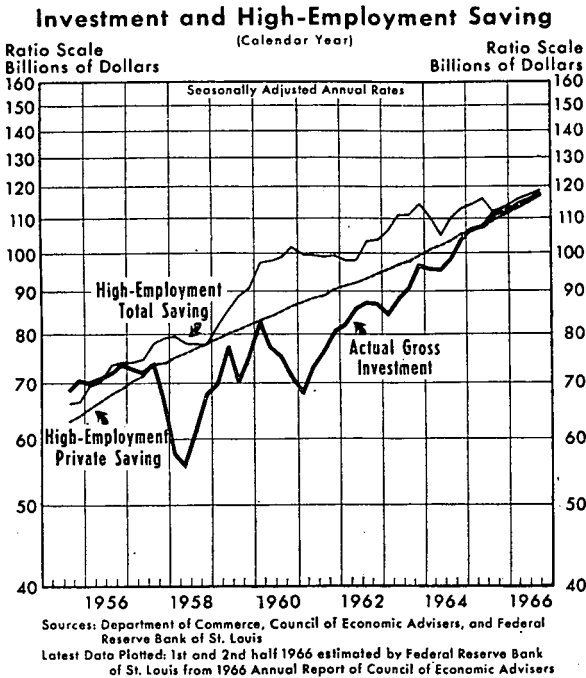
$$(5) \quad I - S_H = T_H - G.$$

The left-hand side of equation (5) indicates the private sector of the economy, the right-hand side, the Government sector. The larger is high-employment Government saving ($T_H - G$), the more investment (I) must exceed saving (S_H) if high-employment with stable prices is to be achieved. Alternatively, the more investment (I) exceeds saving (S_H), the larger must be high-employment Government saving ($T_H - G$) if optimal GNP is to be achieved.

ECONOMIC SETTING

Economic activity advanced strongly in calendar 1965, continuing the expansion which began in early 1961. GNP rose 5.5 percent in real terms and unemployment approached 4 percent of the labor force late in the year. Fiscal and monetary actions provided a strong stimulus to the economy during calendar 1965.

Recent economic experience in a saving-investment framework. With reference to the framework outlined above, actual investment approached planned high-employment saving during calendar 1965, resulting in high employment and production. This was the first time since late in 1956 that actual investment and planned high-employment saving were so nearly in balance.



From calendar 1957 to mid-1965, high-employment saving exceeded actual investment. The source of discrepancy can be attributed to two primary factors—the amount of investment spending and the level of high-employment government (Federal, State, and local) savings.

The historical record indicates the importance of monetary and fiscal actions in influencing economic activity. Federal fiscal actions are reflected directly in high-employment saving and in investment. In addition, saving and investment, particularly the latter, are responsive to monetary actions via interest rates. The period since 1961 has been marked by very stimulative monetary actions, while fiscal actions have been stimulative at some intervals during the period.

Stimulative fiscal actions during the 1961–65 period included a rising trend of Federal expenditures during the period, revised depreciation guidelines and an investment tax credit in calendar 1962, reduced income tax rates for individuals and corporations in calendar 1964 and 1965, and reduced excise tax rates in mid-1965. These actions were offset in part by an increase in social security tax rates in calendar 1963 and the normal growth of revenues associated with the upward trend in income and employment.

Prospects for economic activity in calendar 1966. The Council of Economic Advisers (CEA) has forecast GNP and its components for calendar 1966 (without, however, providing a distribution between halves). This forecast takes into consideration fiscal plans and, supposedly, an implicit assumption about monetary policy. The forecast

for GNP is \$722 billion for the calendar year 1966 as a whole.⁹ This suggests that GNP will be about \$711 billion in the first half and \$733 billion in the second.

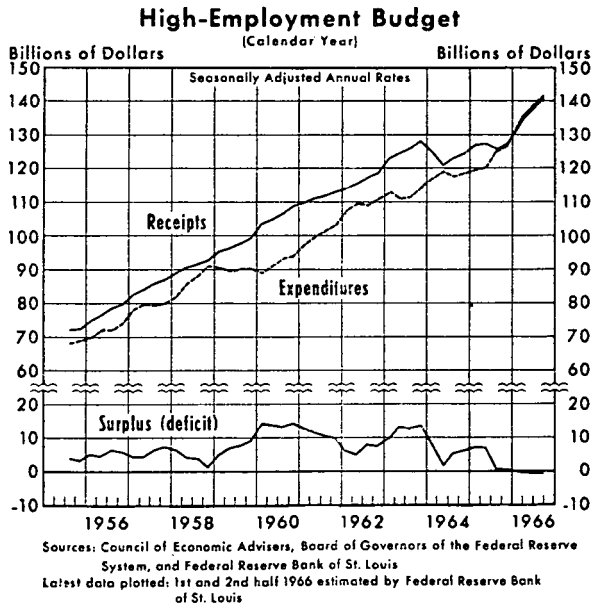
The composition of the forecast increase in GNP in calendar 1966 does not differ markedly from previous years. Federal purchases of goods and services are scheduled to rise more rapidly, while consumer spending, plant and equipment expenditures, and state and local government outlays are expected to continue their steady advance.

Actual gross investment and high-employment saving are expected to be in approximate balance. It is this relation that underlies the CEA's belief that high employment can be maintained without excessive price inflation. Any tendency for investment to outrun high-employment saving would indicate excessive total demand and be reflected in increased prices.

BUDGET POLICY IN ITS ECONOMIC SETTING

Budget policy is outlined in the budget document on a fiscal year basis; the annual report of the Council of Economic Advisers provides additional insight into the implications of the budget for calendar 1966. The last section of this article attempts to analyze planned budget policy for calendar 1966.

High-employment budget. The high-employment budget is expected to move from a small surplus (Federal Government saving in terms of our analytical framework) in the second half of calendar 1965 to a slight deficit in the first half of calendar 1966. This fiscal stimulus arises from an increase of expenditures in excess of the restrictive measures on the receipts side—viz, rescinding of excise tax



⁹ Since the publication of the CEA report the GNP estimate for the fourth quarter of 1965 has been revised upward by \$2.6 billion. This statistical revision implies an increase in the CEA forecast from \$722 billion to nearly \$726 billion. Furthermore, data for the first 3 months of 1966 indicate that economic activity may be advancing even more rapidly than the CEA expected.

cuts on automobiles and telephone service, increased social security tax collections, speedup of individual and corporate tax collections, and normal growth in revenues as the economy expands.

The second half of calendar 1966 also is expected to show a net fiscal stimulus; the high-employment budget is expected to move toward a larger deficit of about \$1 billion. Planned increases in expenditures are expected to be larger than the growth in receipts. Increases in receipts will have to flow almost entirely from rising incomes, because no tax increases are scheduled in the budget plan for the second half of calendar 1966. Graduated withholding of personal income taxes may dampen purchasing power somewhat, but the impact is not expected to be large. The speedup in corporate tax collections is not designed to change payment schedules in the second half of calendar 1966.

In the first half of calendar 1967 the high-employment budget is expected to show a surplus as the rate of increase of expenditures tapers off and receipts continue to climb because of rising incomes. Estimates so far in the future are not reliable, however, because of many contingencies and uncertainties, particularly regarding the war in Vietnam.

Fiscal plans and economic setting—An evaluation. Budget policy in calendar 1966 as presented in the CEA report is predicated on the belief that actual gross investment will be approximately equal to planned high-employment private saving. High-employment government saving is expected to be slightly more than \$2 billion, consisting of a State and local government surplus partly offset by a slight deficit in the high-employment Federal budget.

Of critical importance in judging the economic impact of the Federal budget is whether a dollar of receipts restrains private demand by a like amount. An implication of the high-employment budget as a measure of fiscal impact is that a dollar of increased expenditure has the same economic effect as a dollar decline in tax receipts. The validity of this assumption is especially important when it is noted that the budget program for calendar 1966 plans a near balance in the high-employment budget but includes marked increases in both expenditures and receipts. If a dollar increase in tax receipts does not restrain private spending by the same amount, the high-employment budget understates its fiscal impact.

As noted above, the national income accounts measure Government purchases at the time of delivery. Thus, the high-employment budget may not be entirely accurate as a measure of fiscal impact for this reason. If the flow of Government orders is relatively smooth, the Government expenditure series may accurately measure the impact of the budget on the economy over time. However, at times of sharp changes in Government orders, the economic effects of the change are not recorded in the budget accounts until the goods have been delivered.¹⁰

Such a factor may be particularly relevant early in calendar 1966. Increases in Government spending are projected over the current fiscal year (fiscal 1966) and the next, but new obligational authority

¹⁰ For a discussion of this view of the Government spending process and its relevance for the 1967 Federal budget, see Murray L. Weidenbaum, "The Inflationary Impact of the Federal Budget," Washington University Working Paper 6529 (Feb. 10, 1966).

is soaring this fiscal year and is scheduled to taper off in fiscal 1967. If it is the order stage of the Government spending process rather than the delivery stage which is relevant for measuring fiscal impact, the effect of projected increases in Government expenditures may be having its major impact currently (in the first half of calendar 1966).

Another implication following from this thesis is that the economic stimulus of the current defense buildup may evaporate late in calendar 1966 or early in calendar 1967 if the scheduled changes in obligational authority are realized.

The Council's economic plans appeared to be internally consistent at the time of publication of their report in late January. These plans, however, left little margin for error, even within their analytical framework. Any unexpected increase in expenditures would require offsetting fiscal or monetary actions. Granting their assumptions about expenditures, receipts, and the level of GNP, there is some question whether budget policy was designed to restrain total demand sufficiently to avoid price inflation, given the shortcomings of the high employment budget as a measure of fiscal impact.¹¹

Since late January major measures of economic activity have indicated that total demand is rising more rapidly than the Council anticipated in their report. Within the saving-investment framework, it appears that planned investment is in excess of planned high-employment private saving. Such a situation would be appropriate if offset by high-employment government saving. This does not appear to be the case; it seems likely that the Federal Government is experiencing a high-employment deficit which is not being offset by a state and local government surplus.

Given this fiscal stance, investment and high-employment total saving (private and government) can be brought into equality by policy action designed to (1) discourage investment and/or (2) encourage private saving.¹² A failure to do one or both will result in price increases.

Unless fiscal plans are changed, the aim of monetary policy should be to dampen investment plans and to encourage private saving via higher interest rates, thereby reducing inflationary pressures. Higher interest rates would also be beneficial to the balance of payments by keeping U.S. prices competitive with the rest of the world and by reducing capital outflows. While such higher interest rates may have some social disadvantages, they may be more than offset by the benefits of stable prices and an improved balance of payments.

KEITH M. CARLSON.

¹¹ This is not to imply that the Council is not aware of these shortcomings. See the testimony of Gardner Ackley, Chairman of the Council of Economic Advisers, before the Subcommittee on Fiscal Policy of the Joint Economic Committee, July 20, 1965.

¹² Administration statements in recent weeks have indicated a possible move in the direction of fiscal restraint if price pressures continue in evidence. An increase in individual and corporate tax rates would increase Government saving and tend to discourage investment.

THE OUTLOOK FOR DEFENSE SPENDING—HOW GREAT AN UNCERTAINTY?*

By WILLIAM H. CHARTENER, Economist, Goldman, Sachs & Co.

During the current business forecasting season a hedge that is fast overtaking the privet and the boxwood in popularity is the uncertainty occasioned by the war in Vietnam. This, we are told, makes the economic outlook for 1967 unusually hazardous to forecast. In some of the more tremulous analyses, the forecaster confesses disarmingly that he really has no idea what will happen—but if it does, all bets are off,

In the popular sense of the word "uncertain," this approach has some validity. Conceivable developments in Vietnam range all the way from an abrupt withdrawal of U.S. forces to a thermonuclear war with Communist China and the Soviet Union. Defense spending might, conceivably, drop \$10 billion (annual rate) by the end of 1967, or increase \$50 billion—with a comparably wide range of implications for the economy:

In a statistical sense, however, the "uncertainty" attached to the outlook for the war and for defense spending is subject to more precise and more useful definition. A forecast of defense spending through the end of 1967 made now does involve somewhat more uncertainty than a forecast of corporate depreciation, consumer expenditures for services, electric power generation, the tides, or California weather in August. But it involves *less* uncertainty—in the sense of probable relative error—than a forecast of auto sales, housing starts, inventory accumulation, the balance of payments, the stock market, or California weather in December.

Specifically, I shall put my view of the outlook for defense spending in these terms: *Defense spending on the Commerce or gross national product basis appears likely to continue increasing at an annual rate of about \$1 billion a quarter through next spring, then \$1 billion a quarter to the end of 1967. This would mean total defense purchases of goods and services of \$65 billion in the calendar year 1967, up from about \$58 billion in 1966 and \$50 billion in 1965. On the administrative budget basis, I expect defense spending (including atomic energy) to total \$66 billion in the 1967 fiscal year, as compared with the \$57.7 billion now officially estimated for fiscal 1966 and \$60.5 billion estimated for 1967 in last January's budget.*

To attach numerical though highly subjective value to the "uncertainty" surrounding these figures, my current impression is that there is a 70-percent probability—or about a one sigma range—that defense spending in 1967 will fall within \$2 billion plus or minus of the estimates on the two bases. Outside this central range, the distribution becomes quite skewed: I would assign only a 5-percent probability to defense expenditures being lower than these estimates by more than \$2 billion and the remaining 25 percent to the wide open upper range.

* Paper presented before the Annual Meeting of the American Statistical Association, Los Angeles, Aug. 18, 1966.

In quoting odds on the outlook for defense spending, I do not mean in any way to minimize the gravity of the war in Vietnam or the seriousness of its implications for the U.S. economy. My purposes are two:

(1) To observe that the business forecaster does not discharge his obligation when he characterizes an important set of determinants of his forecast as "uncertain" without providing some guide to the probable configuration; and

(2) To emphasize that, in being bemused by the less likely extreme courses the war in Vietnam and defense spending *can* take, one may lose the practical economic advantages and the psychological security that are apt to flow from confident action premised on the more probable central range.

From this point our analysis will concentrate on what seems to me to be a narrowing degree of uncertainty regarding the dimensions of the war in Vietnam and total defense spending in 1967.

THE PATTERN OF ESCALATION

Special costs of the war in Vietnam accounted for only 10 percent, or \$5.8 billion, of total budget expenditures for defense in fiscal 1966. But most of the increase in defense spending occurring in 1966 and anticipated for 1967 results from Vietnam. Both in dollar amount and in percentage of total defense spending, Vietnam outlays will probably be at least twice as great in fiscal 1967 as in 1966

Escalation of the U.S. military effort in Vietnam has been gradual, over a period of a dozen years and three presidential administrations, beginning with the assignment of military advisers and now including intensive bombing of military targets in North Vietnam and the demilitarized neutral zone. Escalation on the part of the Vietcong and North Vietnam, both on their own initiative and in response to U.S. efforts, likewise has been gradual.

Despite the gradual nature of this progression, two points in time can be identified as involving major shifts in the scale of the U.S. effort in Vietnam and major changes in the prospective magnitude and pattern of defense spending.

The first shift came in the summer of 1965, when U.S. forces assumed direct and open responsibility for combat operations in Vietnam. The President then requested a supplemental defense appropriation of \$1.7 billion and promised to return for more in January 1966. (Vietnam, incidentally, had come in for scarcely any mention at all in the January 1965 budget.) At the time of this change in scale of effort, the *outlook* for defense spending changed from essentially flat to a rise of at least a billion dollars a quarter.

The second important shift came last winter when the President and the Defense Department gained a fuller appreciation of the costs of achieving their objectives in Vietnam. The President then requested a \$12.8 billion supplemental appropriation for Vietnam and budgeted a large increase in defense outlays. On the basis of the January 1966 budget and other official statements last winter, the *outlook* for defense spending changed again, implying a rise at a rate of about \$2 billion a quarter for several quarters. It was then that the figure of 400,000 began to be mentioned as the target for deployment of U.S. military personnel in Vietnam by the end of 1966.

There appears to have been no further basic change in the scale of effort *planned* by the U.S. in Vietnam since last winter. If there has been, it is not evident in official statements nor in data on expenditures. Nor, so far as I have been able to ascertain, has information indicating any basic change in plan been communicated by the President and the Defense Department to the other vitally interested Government agencies.

I emphasize *plans* and *outlook* in discussing the Vietnam war and defense spending because these are our principal interest and because it is easy to lose perspective when actual day-to-day events change rapidly and dramatically. Each new troop buildup receives a headline; and each time an unidentifiable Pentagon employee speaks of an increase in U.S. troops in Vietnam to 400,000 by the end of the year, this also is considered news that's fit to print on the front page.

Thus the January 1966 budget—with some modifications and statistical license I shall describe presently—along with official statements issued in support of that budget remains the best source of detailed information on defense spending prospects for the period to mid-1967. And this is likely to remain the case until the fiscal 1968 budget is announced next winter.

ADJUSTING THE BUDGET

To this point most of our discussion of defense spending has been in terms of the national income and product accounts, as this is the basis on which defense spending figures enter the typical general economic forecast. The budget figures are of the same general magnitude and show the same general trend—as can be seen in the charts—but there are differences, particularly in timing.

Defense expenditures on the administrative budget basis were estimated as follows in the January budget. Preliminary actual figures for the completed 1966 fiscal year also are given.

[In millions of dollars]

	1965 actual	1966		1967 estimate
		Estimate	Actual	
Department of Defense, military functions.....	46,173	52,925	54,363	57,150
Military assistance.....	1,229	1,275	945	1,150
Atomic energy.....	2,625	2,390	2,404	2,300
Total ¹	50,163	56,560	57,700	60,541

¹ Total includes defense-related activities, which are negative in 1966 and 1967.

Considering the rapidity of the buildup in Vietnam in recent months, actual expenditures in fiscal 1966 came reasonably close to the January budget estimate. Examination of the monthly status of funds reports of the Defense Department for details on spending by broad category through the month of May bear out this observation. Much of the billion-dollar "error" can be ascribed to the expansion of number of men in uniform ahead of schedule. Military personnel had been expected to total 2,987,000 on June 30, 1966, and 3,093,000 on June 30, 1967. Actually, the June 1967 target has already been attained, and presumably some further expansion will occur.

In a harmless display of budgetary plastic surgery, the administration made the total defense spending figure for fiscal 1966 appear smaller than was indicated in the January budget—by removing the \$2.4 billion for atomic energy from the broad defense category where it had been lodged previously. The figures used in this paper include atomic energy, to preserve historical continuity of the data.

I indicated earlier that defense spending on the budget basis seems headed toward a total of about \$66 billion in fiscal 1967. You may sense some inconsistency between this figure and the official budget estimate of only \$60.5 billion, especially in view of the contention that there has been no significant change in basic plan since last winter.

Much of the discrepancy can be explained by a special feature of this year's budget. Secretary McNamara described it in these words in his statement before the House Armed Services Committee on March 8:

* * * we have had to make a somewhat arbitrary assumption regarding the duration of the conflict in southeast Asia. Since we have no way of knowing how long it will actually last, or how it will evolve, we have budgeted for combat operations through the end of June 1967. This means that if it later appears that the conflict will continue beyond that date, or if it should expand beyond the level assumed in our present plans, we will come back to the Congress with an additional fiscal year 1967 request * * *

Because of this arbitrary assumption, the budget itself, and to an even greater extent the appropriation request, imply a tailing off of orders and expenditures for items that would not be delivered or consumed until after the June 30, 1967, cutoff date. Total obligational availability proposed in the budget is actually lower for fiscal 1967 (\$60.4 billion) than for fiscal 1966 (\$64.9 billion). The 1965 figure was \$50.1 billion.

At some point in the next few months, the Defense Department must revise its program to reflect a new assumption regarding the duration of the war in Vietnam. My own expectation, as of now, is that the revised assumption will involve continuance of hostilities within the present broad framework into fiscal 1968, that a 1967 supplemental appropriation of at least \$5 billion will be requested, and that fiscal 1967 budget expenditures will also be increased by slightly more than \$5 billion.

This adjustment reflects primarily the effect of a revised assumption on the duration of the war. It also includes some allowance for the results of the faster-than-scheduled expansion of uniformed personnel, the earlier-than-expected military pay increase, the impact of general price inflation on costs of defense orders, and the unanticipated costs of fighting a war whose dimensions are not entirely within U.S. control.

As indicated in the chart showing quarterly data, defense expenditures on the budget basis tend to fluctuate more widely than on the GNP basis and to move somewhat in advance. This is because the budget figures, as charted here, are not seasonally adjusted and because they include progress payments to contractors. In a time of rising defense expenditures, orders and production are reflected in budget expenditures because of these progress payments before they

show up as purchases of goods and services by the Government. In the GNP accounts, the rise in defense production shows up first as an increase in inventory of goods in process. This process is explained in some detail, with comments on its important economic implications, in articles by Prof. Murray Weidenbaum, of Washington University (St. Louis). The chart shows defense spending on the two bases—budget and GNP—drawing together during 1967 as the rate of deliveries catches up with the placement of procurement orders and current production rates.

THE OUTLOOK FOR PEACE

The analysis presented here assumes continuance of hostilities in Vietnam through the entire calendar year 1967, in much the same general framework as at present, but with U.S. forces applying increasing efforts and spending increasing sums of money. The U.S. objective sounds modest enough. As stated by Secretary McNamara, it is "a stable and independent government free of Communist control." But perhaps the limited nature of the objective makes it all the more difficult to attain.

Because of repeated pressures on both sides in the conflict from most other nations in the world, I would expect some progress to be made during the next 16 months toward bringing the war to an end. But, in view of the pathology of the conflict over many years, it seems unduly optimistic to expect peace negotiations to reach a stage that would permit significant relaxation of the U.S. commitment in Vietnam within the horizon comprehended here.

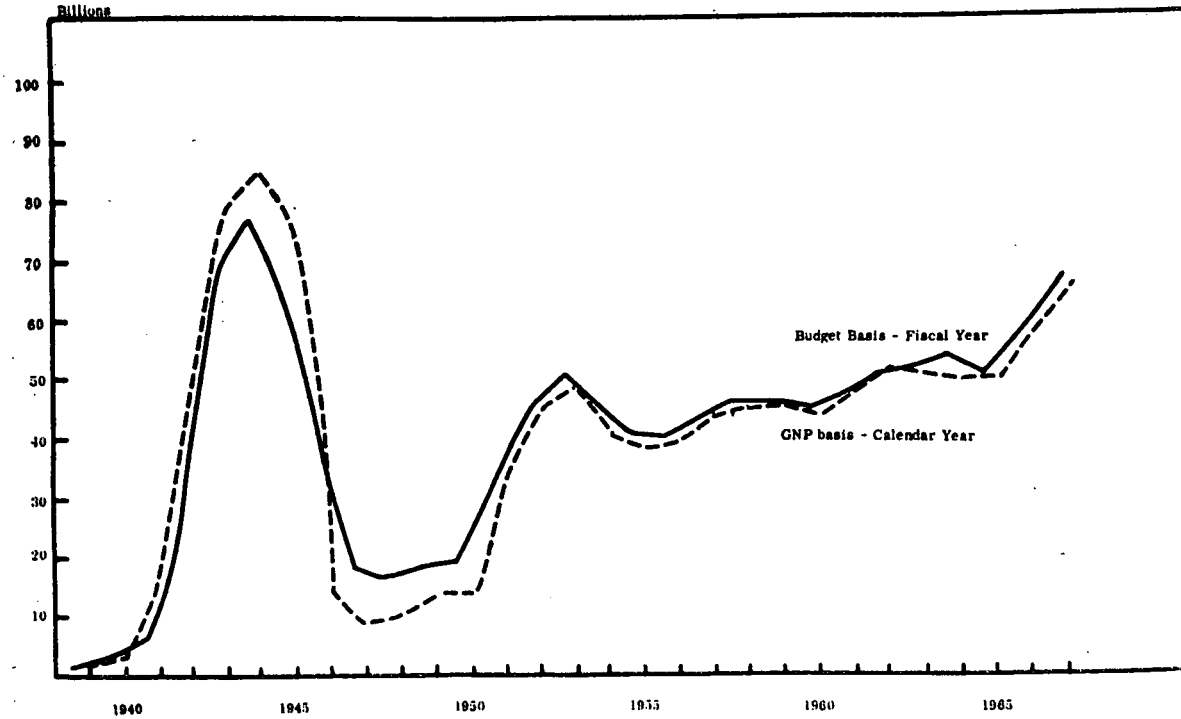
In the other direction—that is, expansion of the area of conflict—developments of the past few weeks offer strong reason to expect that Communist China and the Soviet Union will not change the essential nature of their support of North Vietnam. There has been, in response to U.S. bombing of targets in North Vietnam, an escalation of rhetoric and the boycotting of a track meet which the Russians evidently were going to lose anyway. But there is no evident disposition to convert the conflict in Vietnam into World War III.

CONCLUSION

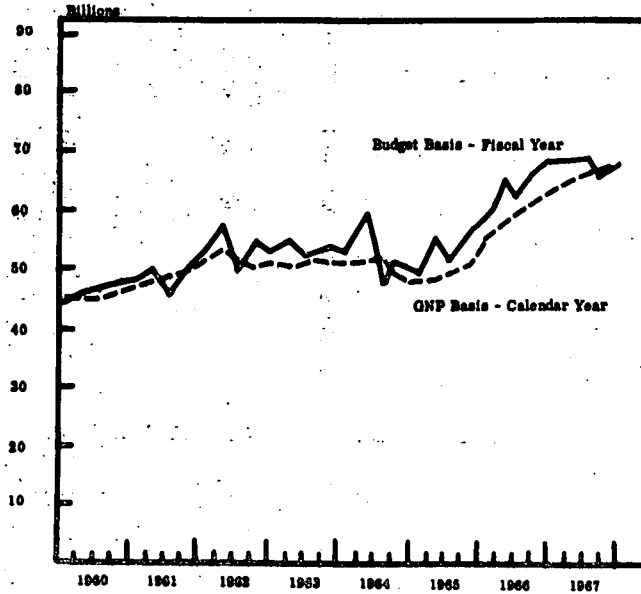
Thus we are left in this fairly narrow band of uncertainty regarding the prospective course of the war in Vietnam and of defense spending in 1967. It is an outlook that promises continuing strains on the U.S. economy, but only because other pressures on productive resources are present. As the final chart shows, the proportion of GNP going to defense goods and services will remain modest by any recent standard. The prospective magnitude of defense spending should therefore be within the capacity of the economy.

To conclude this analysis in the most practical economic terms, the increase in defense spending now in prospect for next year should not in itself require a tax increase.

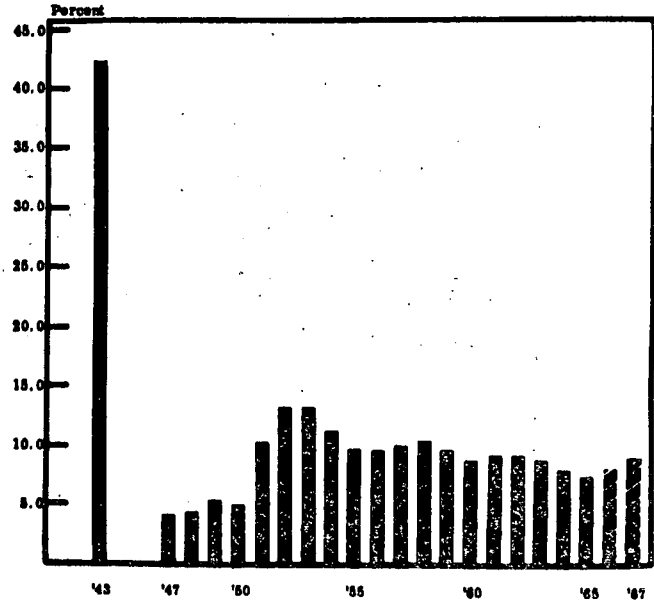
Defense Expenditures 1939 to 1967



Defense Expenditures Quarterly Basis 1960 to 1967



Defense Expenditures As Percent of GNP



NATIONAL DEFENSE AND PROSPERITY*

On July 28, 1965, the President asked the Congress for supplemental funds for defense spending in order to meet the increased requirements of our commitments in southeast Asia. That request opened up a new chapter in the annals of our economy and economic policy; and our history is still being written in that chapter.

The economy moved ahead very rapidly in late 1965 and early 1966, attaining the lowest rates of unemployment and the highest rates of industrial utilization achieved on any sustained basis since the Korean war. The Nation recorded outstanding heights of achievement in output, employment, and real incomes. But we also registered some less welcome new heights in interest rates; and we interrupted a gratifying record of remarkable price stability that had persisted through the first half of the 1960's.

The latest chapter of our economic history is marked by new episodes in the use of economic policy. Our stabilization tools were employed to achieve restraint rather than stimulus of demand. For years, promoting balance in the economy had called for strengthening demand to make it match supply. Suddenly, demand threatened to be too large. Talk and action focused on tax increases rather than tax cuts. Monetary policy occupied the center of the stage more often than ever before.

These developments occurred simultaneously with an important buildup in our defense expenditures and military manpower. None of them was independent of the developments in defense. But the interrelationships are not simple. The connections between the developments in defense and the record of our economy in this Vietnam chapter deserve careful inspection to throw light on our recent progress and problems. Such an understanding is also vital in appraising the challenges that lie ahead—in the short run, sustaining steady growth and stability during the period of active hostilities; and, over the longer term, maintaining high employment in a peacetime environment.

PRIOR TO THE DEFENSE BUILDUP

In considering the economic impact of the recent defense buildup, we might remind ourselves how well we were doing when it first began. As of mid-1965, we had enjoyed an uninterrupted economic advance for 52 months, the longest peacetime expansion in our history. Our real GNP had expanded by about one-fourth in that period, considerably faster than the growth of the economy's supply capabilities. We were able to catch up as well as keep up with our growing capacity.

The unwanted reserves of idle men and machines gradually were brought into productive use. Unemployment, which had amounted to more than 7 percent of the civilian labor force in May 1961, was down to 4½ percent. The average operating rate of our industrial

*Remarks by Arthur P. Okun, Member, Council of Economic Advisers, before the American Ordnance Association, Fort Lesley J. McNair, Washington, D.C., Oct. 12, 1966.

capacity was up to 90 percent after a substantial rise from the recession low of 78 percent in early 1961. The record of price stability was equally impressive: average consumer prices in July 1965 were only 6 percent higher than they had been in early 1961, and prices of non-food commodities had risen only 3 percent. Manufactured finished products at wholesale were selling, on average, less than 1 percent above the level at the start of the expansion.

The progress of the economy from early 1961 to mid-1965 owed much to the active use of expansionary fiscal policy. Through reform of depreciation rules in 1962, the initiation of the investment tax credit also in 1962, and the tax reductions following from the Revenue Act of 1964, earners of both corporate and individual incomes enjoyed a one-fifth reduction in their tax liabilities.

Meanwhile, Federal spending on goods and services stayed on a plateau. After mid 1962, there was little change—actually a modest decline—in the dollar total of defense expenditures. Therefore, as a share of our growing GNP, these outlays fell steadily from 9.5 to 7.3 percent. Defense spending was clearly not the fuel propelling the economy toward full employment. Rather the decline in the defense share was a lubricant that greased the wheels. It made possible reductions in taxes at the same time that important new civilian objectives of the Federal Government were being pursued through the President's Great Society programs.

The private investment share of GNP rose to make up for the decline in defense; meanwhile, State and local outlays continued to absorb a growing fraction of our real output; and, contrary to their usual behavior in a period of rapid economic expansion, consumer purchases held their own as a share of GNP.

Given the healthy economic environment in the spring of 1965, policy was aiming to provide further stimulus to complete the advance to full employment. Congress enacted a major reduction of excise taxes, and the first stage took effect in June 1965. A liberalization of social insurance benefits was enacted to take effect retroactively and was scheduled to give the economy a significant stimulus in the fall of 1965. Monetary policy continued to pursue a quiet life, meeting the credit needs of a brisk expansion and contributing to the stability of long-term interest rates that was so unusual for a period of rapid economic advance.

THE PERIOD OF SPEEDUP

The pace of economic advance quickened markedly in late 1965 and early 1966 with defense and business fixed investment leading the way and consumption close behind. GNP, which had been advancing at an average rate of \$11 billion per quarter, rose an average of \$16 billion per quarter between the second quarter of 1965 and the first quarter of 1966. The annual rate of real growth was a phenomenal 7.2 percent. Unemployment started dropping rapidly and, in February, reached what is still the low point of this expansion—3.7 percent of the labor force. But along with the important progress came some disturbing problems—accelerating prices, soaring interest rates, and a shrinking surplus in international trade.

On top of the deliberate fiscal stimuli that were coming into play and the forward momentum of a strong economy close to full employment, the \$2 billion a quarter rise in defense outlays undoubtedly

played a key role in the acceleration. It contributed to the already great and growing strength of business investment demand by generating needs for new capacity and by lifting economic expectations. Defense was the extra margin, unanticipated and economically unwanted. Yet, over this interval of three quarters, the increase in defense outlays was only \$5½ billion (annual rate) out of the \$48 billion rise in GNP. It was much smaller than the increase of \$9 billion in private business fixed investment. A little extra stimulus went a long way—but it was only a little extra stimulus.

THE WELCOME SLOWDOWN

Since the first quarter of 1966, the pace of advance has clearly moderated. The growth of industrial production and nonfarm payroll employment since March has been about half as large as the spectacular growth of the preceding 6 months. The recent expansion in the economy has proceeded essentially in parallel with the growth of capacity. Thus, the unemployment rate has been on a plateau between 3.7 and 4 percent for 9 months, and average operating rates of manufacturers have also been stable.

Thus, in a relative sense, we have witnessed a "slowdown." More descriptively, we have adjusted to a safe speed from an excessive speed that threatened to generate intolerable price and wage pressures. An economic slowdown can be worrisome or it can be welcome—our recent experience clearly belongs to the second variety. Fiscal and monetary policy since the turn of the year have aimed at bringing about such a slowdown. The recent moderation is a tribute to their effectiveness and a piece of reassuring evidence on our ability to operate flexible policies in a changing economy.

Fiscal policy, after years of expansionist aims, was shifted into reverse with the President's budget in January. Six billion dollars of private purchasing power were siphoned off through higher payroll tax rates legislated last year for medicare and social security liberalization. The President requested and Congress promptly enacted legislation to reverse some of the earlier excise tax reductions and to accelerate payments of both individual and corporate income taxes. At the same time, apart from Vietnam costs, the administrative budget for fiscal year 1967 was held to an increase of 1 percent or \$600 million, as requests for new appropriations for less essential nondefense programs were stringently pared down.

In the first half of 1966, the Federal budget on the national income accounts basis—our best measure of the economic impact of fiscal policy—was operating at a surplus of \$3 billion. In years gone by, we have always carefully made another calculation of where that budget would have been if the Nation had been operating at full employment. This year I need not offer that hypothetical calculation because the economy has come up to its statistical full employment benchmark; thus, the actual and hypothetical surpluses are essentially identical. Within the initiation of medicare benefit payments, the significant surplus will not be repeated in the second half of this year; but present prospects for revenue and expenditures do not suggest that we will be consuming red ink.

Monetary policy has played a particularly important role this year. By pursuing a strategy of active restraint, it deliberately restricted

the growth of credit supplies below the large increases that were being demanded. Declines in residential construction and in commercial building offer eloquent testimony to the potency of tight money in curbing demand.

POLICIES TO IMPROVE THE BALANCE

Thus, although defense spending kept forging ahead, the tools of general economic stabilization were able to achieve a quite satisfactory overall rate of economic advance this spring and summer. But the pattern of this deceleration was not equally satisfactory. It turned out that general monetary tools had, in fact, operated very selectively on the homebuilding industry and had barely touched business investment expenditures, apart from commercial construction. Capital spending demands moved ahead with undiminished vigor and put intensifying pressures on our machinery and equipment industries.

With administration support, Congress enacted financial legislation designed to improve the balance in our capital markets: FNMA's ability to support the home mortgage market was strengthened, and regulatory agencies were given new authority to set ceilings on the interest rates paid on savings by financial institutions. The Federal Reserve used this new authority along with its existing powers in several ways to smooth out the pressures in financial markets.

But fiscal policy was also needed to deal with the remaining imbalances. On September 8, the President announced a cutback and holddown on civilian expenditures. He also proposed to Congress two additional fiscal steps—the temporary suspension of the 7-percent tax credit for equipment and of accelerated tax depreciation on new structures. Once enacted, these measures should help to take some froth off the investment boom and thus to ease the strong pressures on financial markets and skilled labor supplies that the capital boom has generated.

As we look back over the past year, the most notable blemish on our economic record is the 3½-percent rate of price increase that we have experienced at both wholesale and retail. That rate of increase is considerably larger than we can reasonably tolerate over any extended period; in fact, a major goal of public policy for the year ahead must be to work back toward price stability.

It is important, however, to see these price increases in perspective. The fact that much of the rise has taken place in food prices offers no particular comfort to the housewife. But it is significant because, unlike some industrial prices, these prices are flexible in both directions. It is also significant because the spurt in food prices reflects several special and probably temporary circumstances within agriculture as well as the rising demands of a rapidly growing economy. Apart from farm products and foods, wholesale prices are up 2.3 percent in the past year; and the consumer price index, excluding food, shows a rise of 2.9 percent. For nonfood commodities, the increase of consumer prices was 1.8 percent.

Any objective appraisal of consumer welfare must look at both sides of the equation—the incomes people have to spend as well as the prices of the goods they buy. Such an appraisal makes clear that all major groups have recorded substantial gains over the past year. The key to consumer welfare lies in wages and salaries, which represent more than two-thirds of total family income. Total payrolls have risen 10

percent in the past year. The spurt should not be read as a major jump in wage rates. Much of this large gain comes from reduced unemployment, steadier work, job upgrading, and the big jump of employment in high-wage manufacturing industries. But the extra 10 percent is there to be spent by American workers.

Much the same performance has occurred in other forms of income—dividends, interest income, farm income per farm, and corporate profits all show increases ranging from 8 to 11 percent over the past year. The benefits of social security liberalization and medicare to older citizens are partly reflected in the 17-percent increase in Federal transfer payments over the last 12 months. Even after all the proper adjustments to these figures for the 2-percent increase in our population and labor force and the 3½-percent increase in consumer prices, it is terribly hard to turn this record into a sad story.

The price performance of recent months, moreover, has begun to reflect our more moderate pace of economic advance. The index of industrial wholesale prices (1957-59=100) stood at 105.2 in both July and August; it was 105.1 in September. It is rightly said that a large change in 1 month does not make a trend, and it follows that no change for two monthly intervals does not make a plateau. But it is welcome news. Indeed, in September, selected types of machinery and building materials were outstanding as the only manufactured items showing strong upward price movements. International trade data may also be showing some encouraging signs; the balance has not been on a deteriorating trend since April and it may actually be turning around.

DEFENSE AND ECONOMIC POLICY

The brief review of the past year reveals a number of ways in which the defense buildup has complicated the problems of managing economic policy. In particular, the sharp spurt of demand which the defense buildup triggered off late last year and early this year had serious impacts on prices. In the absence of added defense outlays, we would not have sprinted up to and beyond the 4-percent unemployment line. Many of the strains on supplies would not have arisen if we had reached the same levels of utilization on a more gradual upward movement. Supply does not adjust instantaneously; a spurt in demand therefore pushes up prices and order backlogs. Overtime, however, supplies do respond and can catch up with demand even while the demands are still growing. We have seen the responsiveness of supplies in certain basic raw materials and metals. In many types of skilled labor, too, supplies have been expanded through time-consuming recruitment and training programs.

A second complication of the defense buildup arises because my profession's skills and knowledge are imperfect. It is particularly difficult to diagnose the psychological impact of a changing defense outlook on business expectations and decision-making. An imperfect diagnosis of this issue was a key reason why economists—inside and outside of Government—underestimated the strength of demand at the start of this year. As of January, the administration recognized that demand was very strong; but we did not realize just how potent and dynamic it was, especially in the business investment areas.

The defense buildup required important shifts of resources among industries. But this task was handled primarily by our flexible

market economy rather than by Government policy. Priority systems for defense materials were, of course, important. But basically, it was the American enterprise system that met the needs of defense so magnificently. In our economic system, manpower, machines, and materials move where they are needed in response to market incentives. The economy takes major shifts in stride. It absorbed a one-third decline in housing starts in a 5-month period without creating pockets of unemployment. It generated a one-third increase—amounting to \$20 billion—in the capital goods sector in the last 2 years before the strains really began to tell. It should not be surprising that the economy adapted to the defense buildup so well.

The recent experience reflects a number of factors: the strong military position we had when the Vietnam emergency began, our use of economic policy tools, and the great size and productive capacity of our national economy. Unlike World War II or Korea, the Vietnam emergency did not require a major reshaping of America's global military strategy. Ever since the Korean war, we have maintained high levels of defense expenditures, continuously rolling over our stock of defense weapons to take advantage of the latest technology and to maintain an up-to-date arsenal. Instead of spending 5 percent of our GNP on defense as we did in 1949 and 1950, we maintained expenditures of 9 or 10 percent of our GNP on defense from 1954 through 1962. These were investments made in readiness for the contingencies that have since turned so regrettably into reality. As a result, the Vietnam conflict found us well prepared and required a relatively small buildup in total military procurement. At 8 percent of GNP, defense purchases in 1966 constitute a smaller fraction of our national output than in any year between 1954 and 1963.

In World War II, because defense expenditures ran 30 to 40 percent of GNP and absorbed such an overwhelming fraction of certain key industrial outputs, it was judged unfeasible to regulate demand entirely through fiscal and monetary policies. Huge budget deficits were tolerated, and they were financed in ways that added mightily to national liquidity. In light of this policy strategy, it was necessary to contain inflation by direct wage and price controls. In the case of Korea, the onset of the conflict was met by the American public with a wave of war hysteria and an outburst of speculation and hoarding. That initial destabilizing buying spree was the key justification for adopting direct wage and price controls.

The huge defects in both the World War II and Korean systems of direct controls were not basically the result of poor planning or inept administration. They were intrinsic to any set of mandatory regulations that enmesh the market in a web of redtape. Inevitably, such a system will often keep price tags stable only through bare shelves and low quality products. On any reasonable assessment, or even a reasonably pessimistic assessment, of the outlook for the Vietnam conflict, there is no earthly reason why we should want to or need to travel that route again.

NORMAL PROBLEMS OF PROSPERITY

Let me emphasize that I am not claiming that the task of managing economic policy in this Vietnam chapter of our history is, in any sense, easy. What I am saying is that the hard challenges that we face are

essentially those of managing a prosperous economy close to full employment—problems that will be little different when we have the opportunity to make policy for full prosperity in a peacetime environment.

In an underemployed economy, fiscal and monetary policies to expand demand can be recommended with conviction and confidence. On the other side, if there were huge excesses of demand, the case for restrictive policies would be crystal clear. But when the economy is close to a smooth path of balanced growth and when the job is to stay on the path, policy-making becomes a much more complicated and delicate task.

Still it is a path. It is not a tight rope where the tiniest misstep in either direction would result in precipitous recession or disastrous runaway inflation. The economy has shown that it can maintain its balance despite substantial swings in demand above and below the ideal rate of growth. That margin for error is the salvation of a free economy and an imperfect economic policy. If it were a tight rope, we would have broken our necks long ago.

Despite past variations, right now we are close to the growth path that we would consider sustainable. The utilization rates of our labor force and our industrial capacity cannot be described as excessive or inadequate. Policy should aim to maintain a steady growth of output, essentially parallel to the growth of our productive capacity. That would require a growth of real GNP of about 4 percent over the year ahead.

To strive for this objective effectively, we shall have to make careful use of our fiscal and monetary tools—always ready to adapt them to changing circumstances and to restrain or ease in full light of developments in private demand and defense. One clear consequence is that we cannot chart our policies far in advance; we cannot maintain an unyielding position regardless of surprises we may encounter on the way.

The uncertainties in defense are one important reason why it is impossible to blueprint the policies for the year ahead. But they are not the only reason. In any period of high employment prosperity, we should want the best information we can get before making decisions on taxes, expenditure programs, and credit policies.

A number of private observers have complained about the uncertainties of Government policy. They want answers about taxes and the budget and interest rates. So do we. But we want the *right* answers and so should they. It would be reckless and irresponsible for the Government to decide whether we are going to have our foot on the brakes or the gas when we come to the next traffic light until we can see whether that light is red or green. At the moment, there are a number of bends in the road before that traffic light will become visible.

The need for voluntary cooperation from labor and management in their price and wage decisions is also best viewed as part of the normal problems of prosperity. The basic dilemma of reconciling high employment with price stability will persist in peacetime. The most effective and wisest use of monetary and fiscal policies cannot make it vanish. Indeed, the self-discipline of business and labor will determine just how restrictive monetary and fiscal policies have to be to sustain steady noninflationary growth. Enlightened private decisions can help make the path of full employment safe and stable, and can permit a larger total of real incomes to be divided between workers and business owners.

The key current problem for the guideposts stems from the recent increases in food and service prices, which have accounted for the major part of our rise in consumer prices. The Nation is now asking the industrial sector whether owners and workers, in combination, will show the restraint to absorb these costs, as they can do without serious sacrifice. To be sure of success in moving back toward price stability, the Nation cannot afford to have the increases in the prices of food and services built into the structure of industrial costs and prices.

CONCLUSION

It should be clear that the increase in the defense budget of the past year did not make our prosperity. Nor did it break our prosperity. If we must, we can live with and adjust to growing defense requirements. We can even adjust to them without tightening our belts absolutely over time. The growth of our productive capacity makes possible an extra \$30 billion of real GNP (apart from any price changes) in the year ahead. We can clearly pay for defense out of that growth and still have more resources left to meet the urgent needs of the civilian economy.

We can certainly live even more happily without a growing defense budget. Naturally, we would all welcome an honorable peace in southeast Asia for reasons that extend far beyond the economic realm. In addition, there would be important economic benefits to be reaped from the enlarged growth of both private and public-civilian spending that would become possible if defense outlays should decline. Both the Congress and the administration would welcome the opportunity to terminate our temporary taxes, to remove some of the restraint from high priority nondefense programs, and to declare new "fiscal dividends" in the form of tax rate reductions.

Wherever the defense budget has to go, it is safe to predict that we will have problems in managing prosperity. But anyone who would label these problems insuperable has simply not read the economic record of recent years.

THE FEDERAL BUDGET AND THE OUTLOOK FOR DEFENSE SPENDING¹

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That perennial whipping boy of economic analysis—the proverbial man in the street—seems to be right once again. Sophisticated economists have been contending that Federal fiscal policy has been one of restraint in recent periods and that the inflationary pressures have arisen in good measure in the private sector, especially from rapid expansion in business capital investment. In contrast, just try asking our wandering pedestrian what is causing the present inflation. The odds are he will reply to the effect that “Don’t you know that there’s a war on, buddy?” This paper says that he is right, and has properly, although intuitively, analyzed the current economic impact of the Federal Budget.

Some perspective may be helpful. In a sense the United States is engaged in a war; but, we do not have a war economy. Ours is truly a mixed economy; we are literally concerned with social security as well as national security. We do not have the controls or runaway inflation often associated with war-time experiences. Yet, we do find an economy pressing very closely to the limits of available capacity and we are making choices somewhat analogous to guns versus butter but not quite so. In a sense, we are choosing both more guns and more butter. However, we are also choosing less private housing and fewer automobiles while we are voting for more urban redevelopment and additional public transportation—thus simultaneously increasing both the military and civilian portions of the public sector in both relative and absolute senses.

Let us first examine the impact of the Vietnam military buildup on the economy as a whole and on the Federal budget; subsequently, I will indicate the effects on various types of companies and regions and then hazard a few projections.

THE TIMING OF THE IMPACT: A MACRO VIEWPOINT

The escalation in the U.S. commitment in Vietnam can, to some extent, be translated into economic impact by looking at the changing pace of military demand. As a benchmark, let us recall that in the fiscal year ending June 30, 1965, total contracts placed, orders let and other “obligations” incurred by the Department of Defense were a shade over \$50 billion. I use the concept of obligations because it is a generic term, including both government payrolls and contracts with private firms. In the January 1966 budget, it was estimated that this rate of making new commitments would rise to well over \$63 billion in fiscal year 1966. Actually, the January budget underestimated the rise in military demand during the fiscal year which was then in progress.

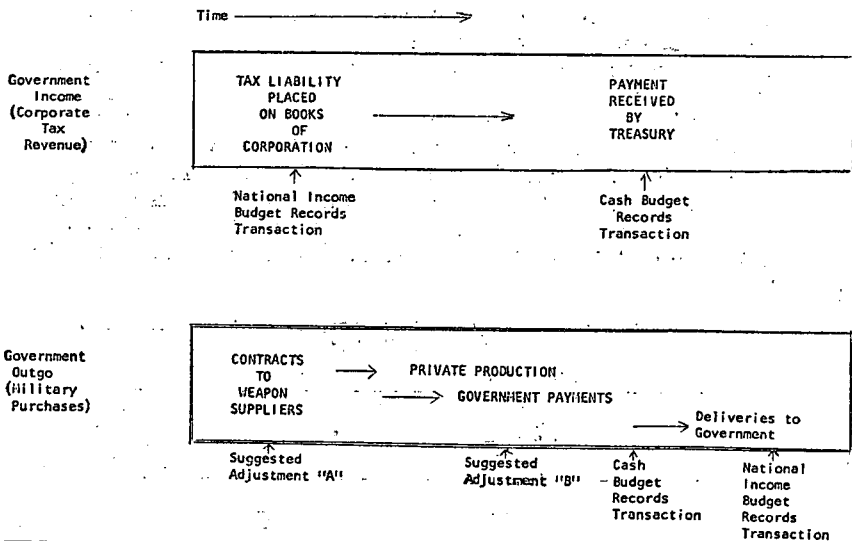
¹ Working Paper 6610, November 1966.

I wish to express my appreciation to Mr. Kenneth Galchus, my research assistant, for both the usual helpful work and for manfully reporting negative findings. I have also benefited from discussions with Harold Barnett, Keith Carlson, William Chartener, and Hy Minsky.

The actual amount of new obligations incurred during the past fiscal year was somewhat in excess of \$67 billion, or fully one-third greater than in 1965. Actual expenditures increased at only half that rate during the same period—16½ percent. In other words, obligations is the sensitive or leading indicator. Unfortunately from the viewpoint of analyzing business conditions, the supposedly most sophisticated measure of government finance, the so-called national income accounts budget, uses a concept that even lags behind expenditures—the delivery of completed military equipment.² To compound the problem, the national income accounts budget picks up government revenues on an accrual basis, which precedes the actual receipt of cash by the Government. (See fig. 1.)

On previous occasions, I have tried to point out that the impact on employment, production, and income of a military buildup may occur primarily at the point in time that budget recommendations are made, increased appropriations are enacted, and orders placed with military contractors. Although this may appear quite obvious to those acquainted with defense industries, the statement of Federal receipts and expenditures on national income account confines the measurement to the actual delivery of completed weapons and other military "hard goods." A considerable period of time often elapses between budget recommendations for military procurement and delivery of the completed items to the government and payment therefore. The primary effect on productive activity, to the extent there is any, normally occurs in advance of the actual government expenditures. Under most circumstances, the placing of orders induces private production on government account and such production remains in the private sector and does not show up as government

FIGURE 1
DIFFERENCES IN RECORDING GOVERNMENT INCOME AND OUTGO



² See my "The Inflationary Impact of the Federal Budget," *Financial Analysts Journal*, July-August 1966, and the sources cited there for detailed analysis of this point. The extent to which deliveries lag expenditures is shown graphically in William H. Chartener, *The Outlook for Defense Spending—How Great an Uncertainty?*, a paper presented before the Annual Meeting of the American Statistical Association, Los Angeles, Calif., Aug. 18, 1966.

expenditures until it is completed and the goods involved delivered to the public sector.

Conceptually, production on government order is not reflected in government purchases of goods and services at the time the work is performed. This activity, as measured by the cost incurred, is currently included, in the gross national product, in the change in business inventories. When the government contractor delivers the finished items, the transaction shows up in the national income accounts as a decline in business inventories.

It is also then recorded as a government purchase of goods and services. These two entries tend to cancel each other out, with no net effect on GNP. At the time it is recorded in the national income accounts, the government purchase does not represent payments to the factors of production; it is more in the nature of an intersectoral transfer—a reimbursement to the government contractor for his outlays during earlier periods.

It is at the order stage that the government action normally will have its initial and often major impact on the markets for labor, raw materials, and financial resources. The contribution to economic activity is made during the production period prior to the actual government "purchase." Indeed, the recording of the government purchase may coincide in time with a reduction in governmental impact on total demand and in repayment of working capital loans by the government contractors.

This may seem like a statistical tempest in a teapot (or a crackpot). However, the upshot is that the official budget and economic reports are very slow to pick up the expansionary impact of the Vietnam buildup, but very quick to take account of the deflationary impact of the revenue speedup. The net result is that the Federal Government appears to have been following a noninflationary economic policy in 1966 when actually it has been a major source of inflationary pressure in the American economy during the past year. I shall try to present some statistical support for that statement.

In table 1, I have assembled a few variations on a theme, the theme being the net Federal surplus or deficit in recent periods. On the far left, I have placed the officially reported surplus or deficit in the so-called national income accounts budget. This, we are repeatedly told from on high, is "our best measure of the economic impact of fiscal policy." On that basis, the Federal budget shifted from a position of ease in the second half of calendar 1965 (a deficit of \$1.4 billion) to some restraint in the first half of 1966 (a surplus of \$3.1 billion).

TABLE 1.—Federal surplus or deficit: Some variations on the National Income Accounts Budget

[Billions of dollars at annual rates]

Calendar year	Federal surplus (+) or deficit (-), official basis	Adjustments for defense obligations		Federal surplus (+) or deficit (-), adjusted basis	
		A	B	A	B
1964:					
1st half.....	-4.3	-0.1	-0.1	-4.4	-4.4
2nd half.....	-1.8	-4.4	-2.2	-6.2	-4.0
1965:					
1st half.....	+4.4	-2.0	-1.0	+2.4	+3.4
2nd half.....	-1.4	-5.2	-2.6	-6.6	-4.0
1966 estimated:					
1st half.....	+3.1	-8.4	-4.2	-5.3	-1.1
2nd half.....	0				

Now I shall try to muddy the waters. The next two columns on that table contain two alternative sets of rough adjustments for the fact that new contracts awarded may be a better proxy for the impact of a military buildup on the economy than delivery of completed weapons. The A series is essentially the excess of military obligations over expenditures during the period, seasonally adjusted and converted to an annual basis. One further change has been made. Over the years, about \$2 to \$3 billion worth of obligations each year do not seem to result in actual expenditures. A number of technical factors are at work here, including some double counting of contracts awarded by one military agency in behalf of another military agency. Such a case might be Air Force procurement of aircraft for the Army, which may show up as an Army obligation to the Air Force, as well as an Air Force obligation to the airplane manufacturer. In computing both the A and B adjustment series, the annual obligation figures were reduced by \$3 billion in each case to take account of the double counting. My intent, of course, is to err on the conservative side.

It can be seen, referring to the A column on the right hand side of table 1, that adjusting for defense obligations results in some significant changes in the "best" measure of Federal fiscal impact. The second half of 1965 is now seen to be a period of much more substantial ease in the Federal budget than shown on the official basis. Of greater interest, of course, is the indication that the first half of 1966 was not a period of fiscal restraint but also one with a substantial excess of outgo over income.

The B adjustment is an attempt to satisfy the more timid. It is a statistical compromise between the two approaches, the result of an arithmetic averaging of military obligations and expenditures for each period. The theoretical rationale that could be offered is that perhaps a more proper counterpart to the liability basis of the corporate revenue computations would be somewhere between the extremes of contract placement and governmental disbursement.

As would be expected, the B results are somewhat more moderate than the A series. The adjusted Federal deficit for the latter part of 1965 is rather large, but, on this basis, the first half of 1966 witnessed a deficit of somewhat reduced proportions. I would suggest that even the B series provides a very weak case for the widely made claim that fiscal restraint occurred during January-June 1966.

ANOTHER KOREA?

It has been fashionable to compare the Vietnam buildup with the Korean experiences in the hope that some parallels would provide a firmer basis for forecasting purposes. However, important differences need to be acknowledged, although they tend to balance each other out.

The first set of differences relates to the smaller relative scale of the present buildup. The current expansion of the armed forces from 2,700,000 to 3,200,000 seems modest indeed when compared to the spurt from 1½ million in 1950 to over 3½ million in 1952. Also, the defense budget doubled during the first year of the Korean war, while, as noted, the increase during the past year was about 16 percent. All this reflects the fact that this is the first time that the United States has entered a major war with a very large existing Defense Establishment.

The second set of differences relates to the fact that, unlike Korea or World War II, the present military buildup was superimposed on an economy which was rapidly approaching full employment. Using June 1950 and July 1965 as the respective beginning points, we find that unemployment was higher in the earlier period (5.4 percent versus 4.5 percent) and the operating rate of industry was lower (80 percent versus 90 percent).

Summing these two conflicting tendencies, we may conclude that even though the current defense program utilizes a smaller fraction of the Nation's resources, it is more in the nature of—but certainly not entirely—displacement of civilian demand rather than resulting in a total addition to actual production of goods and services. Hence, in the absence of direct controls over materials, wages, and prices, it would be expected that inflationary pressures would accompany the rapid shift of resources from civilian to military use.

The Korean experience showed that the strongest inflationary pressures occurred during that first year of the buildup, while the economy was initially adjusting to the new level of military demand. The actual peak in defense spending a few years later occurred shortly before the onset of recession.³ If there is any lesson to be gained from the Korean experience, it is that we particularly need to understand the timing of the impact of the different stages of a defense buildup (and subsequent cutback). Otherwise we can find ourselves fighting yesterday's inflation with a tax increase that will compound tomorrow's recessionary problems.

THE CHANGING MIX: A MICRO VIEWPOINT

Important changes also are taking place within the military budget. Such shifts in its composition are affecting the extent to which different industries and regions are participating in the defense program. The key to understanding these developments is analyzing the changing "product mix" of military spending. The fundamental change is the shift of emphasis away from developing and maintaining in being the potential capability to deal with hypothetical worldwide or general-war situations and toward operating a military establishment actually waging a difficult but limited war whose dimensions keep on evolving. Table 2 shows the extent to which funds for U.S. combat forces have been shifting from general war to limited war programs as the cold war has heated up. It is striking to note that general war forces now receive half of the share of the military budget that they received a few years ago.

However, a more detailed breakdown of the military budget is needed in order to get at the questions of regional and company impacts of this fundamental budget change. Table 3 shows the shifting product mix of military procurement (on an obligations basis). Three major shifts are taking place: (1) a more than doubling in the share of the budget going to tanks, weapons, ammunition and similar conventional battlefield ordnance; (2) a massive reduction in the relative as well as absolute importance of missiles; and (3) the reorientation of the military aircraft budget away from long-range strategic bombers and to tactical aircraft, particularly supersonic fighters and helicopters. The latter point, of course, emerges from

³ M. L. Weidenbaum, "The Economic Impact of the Government Spending Process," *University of Houston Business Review*, Spring 1961, pp. 3-47.

analyzing the details of the budgetary reports. In general, the military budget is looking much more like it did during the Korean war and less than during the more recent period of cold war confrontation with the Russians.

TABLE 2.—*U.S. military budget: General versus limited war*

[Total obligational authority; dollar amounts in billions]

Category of combat forces	Cold war (fiscal year 1962)		Vietnam (fiscal year 1966)	
	Amount	Percent	Amount	Percent
General war capability:				
Strategic offensive forces.....	\$8.9	29.8	\$5.1	13.1
Continental air and missile defense forces.....	2.3	7.7	1.7	4.4
Subtotal.....	11.2	37.5	6.8	17.5
Limited war capability:				
General purpose forces.....	17.5	58.5	30.0	76.9
Airlift and sealift.....	1.2	4.0	2.2	5.6
Subtotal.....	18.7	62.5	32.2	82.5
Total.....	29.9	100.0	39.0	100.0

¹ The remainder of the military budget is devoted to support of the combat forces, research and development, military assistance, and retired pay.

TABLE 3.—*The changing product mix of military purchasing*

[Dollar amounts in billions]

Procurement category	Korean war (fiscal year 1952)		Cold war (fiscal year 1962)		Vietnam (fiscal year 1966)	
	Amount	Percent	Amount	Percent	Amount	Percent
Sophisticated equipment:						
Aircraft.....	\$13.1	43.5	\$6.4	27.1	\$8.6	29.9
Missiles.....	.4	1.3	4.7	19.9	2.1	7.3
Electronics.....	1.3	4.2	1.5	6.4	1.5	5.2
Research and development.....	1.5	5.0	5.7	24.2	7.2	25.0
Subtotal.....	16.3	54.0	18.3	77.6	19.4	67.4
Conventional equipment:						
Ships.....	1.8	5.8	2.2	9.5	1.1	3.8
Ordnance.....	9.2	30.4	2.3	9.6	6.4	22.2
Other.....	2.9	9.8	.8	3.3	1.9	6.6
Subtotal.....	13.9	46.0	5.3	22.4	9.4	32.6
Total.....	30.2	100.0	23.6	100.0	28.8	100.0

Hence, we are witnessing a reversal of the shift that occurred in defense purchasing in the mid-1950's. Once again, the automotive, mechanical, textile, clothing, and rubber companies are becoming important suppliers of war material. The most dramatic increases have occurred in ammunition (up 270 percent during the past fiscal year), clothing and textiles (up 240 percent), tanks and vehicles (up 80 percent), and food (up 60 percent). The large aerospace and electronics firms, although still significant defense contractors, are finding their shares of the military market to be declining. Unlike the period of large weapon systems—such as ICBM's which could only be supplied by a few of the industrial giants—the demands of Vietnam result in numerous smaller contracts involving a great many and variety of medium-size firms as defense suppliers.

There is also a geographic dimension to this change in the military product mix. Large proportions of the companies working on Vietnam orders are located in the upper Midwest and in other relatively older industrial States in the East. The Far West, which had been receiving so large a share of defense orders during the past decade, is experiencing some absolute as well as relative declines. Table 4 shows the highlights of these changes.

Several States have been receiving defense contracts at rates of 40 to 50 percent above last year's levels. These include Connecticut, Illinois, Indiana, Maryland, Michigan, Minnesota, Ohio, Pennsylvania, and Texas. In contrast, Washington State, Utah, and Colorado have seen their defense contracts virtually cut in half during the past 2 years. California is now at the 1963 level, despite the substantial growth in the overall military market which has occurred since then.

TABLE 4.—*The changing geographic distribution of defense contracts*

[Percentage distribution of dollar volume]

Census region	Korean war (fiscal year 1952)	Cold war (fiscal year 1962)	Vietnam (fiscal year 1966)
Northeast:			
New England.....	8.1	10.9	11.9
Middle Atlantic.....	25.1	18.7	17.6
Subtotal.....	33.2	29.6	29.5
Midwest:			
East North Central.....	27.4	12.6	15.3
West North Central.....	6.8	6.7	7.6
Subtotal.....	34.2	19.3	22.9
South:			
South Atlantic.....	7.6	10.4	12.5
South Central.....	6.4	7.8	12.2
Subtotal.....	14.0	18.2	24.7
Far West:			
Mountain.....	.7	4.7	2.5
Pacific.....	17.9	28.2	20.4
Subtotal.....	18.6	32.9	22.9
Total.....	100.0	100.0	100.0

The economic impacts of this shift in the location of defense industry may not be as simple as would appear. The Midwestern States have large, well-diversified industrial bases and these recent increases in their defense orders, although dramatic, may be taken in stride as they will require relatively small proportions of existing manufacturing capacity. On the other hand, defense work in recent years has accounted for a proportionately large share of the total manufacturing employment of many Western States and in several cases for virtually all the growth of such employment in the major metropolitan areas. The adjustment to the changing military market may be especially difficult for those Western States that are not participating in the simultaneous expansion in the commercial aircraft market.

On balance, I would expect that the reorientation of defense spending toward greater emphasis on limited war equipment, which seems likely to outlast the current Vietnam buildup, will have important differential effects on the relative rates of growth in population, income,

and tax bases in the various regions of the country—effects which should primarily be favorable to the Middle Atlantic, Great Lakes, and New England areas.

THE OUTLOOK FOR 1967: WILL FISCAL RESTRAINT BE BIGGER ON THE INSIDE THAN ON THE OUTSIDE?

And now to my cloudy crystal ball. Ordinarily, the Federal Government would have issued by now a Midyear Review of the Budget, updating the estimates published last January. Very impressive reasons are given for the lack of a Midyear Review. As I recall, a different set of excuses were made last year. As a sometime forecaster, I will readily agree that it is always more comfortable not to have to stick your neck out.

Hence, the task at hand for us is to infer future developments from the most recent data. It is almost a situation of constructing a case based solely on circumstantial evidence. Let us begin by analyzing the pattern of military buying during the past year, the fiscal year ending June 30, 1966—which is the latest period for which data are publicly available. Because of the unique seasonal pattern of military ordering and the absence of a seasonal adjustment for earlier periods, it is useful to compare the data for a given quarter with the corresponding period in previous years. Beginning with the July–September quarter of 1965, we find that military obligations during each of the past four quarters were the highest for that respective period since the peak demands of the Korean war in 1952.

In addition, each recent quarter has been higher than the preceding quarter, with the greatest spurt occurring during April–June 1966. Because of the age-old tendency to concentrate Federal commitments in the final quarter of the fiscal year (so-called June buying), not too much can be read into the last quarter of data. However, it does seem quite clear that the upsurge of defense orders is not running out of steam.

The leadtime between ordering tanks, ammunition, and similar conventional limited war equipment is likely to be less than is the case for ICBM's, space systems, and other highly sophisticated aerospace products. Hence, the acceleration in defense buying in fiscal 1966 already has been translated into a \$4 billion annual rate of increase in defense purchases of goods and services in the July–September quarter and likely into another \$3–\$4 billion increase in the current October–December quarter. These estimates account for the first half of fiscal 1967.

Here, this swami's crystal ball begins to cloud up and you need to put some coin in his palm in order to obtain a forecast for the calendar year 1967. Hopefully, the fine print on that coin should contain the military obligation rate for the past quarter and estimates for the next quarter or so. There is little advantage to going back to the January budget; as we later learned, only some time after the document was released, it was based on the optimistic assumption that the war soon would be over. We are really on our own. Two alternative projections of defense spending in 1967 seem to be fashionable these days. The first, a Newtonian or Dow theory approach, says that the current increase in defense outlays will continue through 1967—the rationale being that if the war continues then the military buildup will need to continue.

The second or acceleration principle approach indicates that defense spending should taper off in the last half of 1967, even if the Vietnam fighting continues at its present pace, but, of course, barring another large-scale escalation. The idea here is that you can let up on the gas pedal after the vehicle attains the desired speed—in the present case, the new production lines should already have been put in place and quantity production rates achieved early in 1967. Also, to the extent that some of the recent ordering has been designed to restock military inventories, new ordering can taper off as appropriate stock levels, particularly soft goods, are reached. Because this second approach is somewhat more sophisticated, I tend to lean toward it, but with limited confidence. The assumption of no further military escalation may be too optimistic.

One view that I do hold with greater firmness may be consistent with both of these alternatives and that is that the major shock to the American economy from the Vietnam buildup already has occurred. This statement is made despite the likelihood of Federal defense purchases reaching a total of \$70 billion in 1967, a rise of 40 percent from 1965. Barring a fundamental escalation, it is unlikely that the coming year will witness the 33½ percent increase in defense orders that occurred last year. Hence, the inflationary pressures of a demand-pull nature which we have been experiencing during the past year are likely to subside somewhat, but the cost-push inflationary pressures are likely to continue.

TABLE 5.—Federal receipts and expenditures in the National Income Accounts
[In billions of dollars]

Calendar year	Receipts	Expenditures	Surplus (+) or deficit (-)
1958.....	78.7	88.9	-10.2
1959.....	89.7	91.0	-1.2
1960.....	96.5	93.0	+3.5
1961.....	98.3	102.1	-3.8
1962.....	106.4	110.3	-3.8
1963.....	114.5	113.9	+.7
1964.....	115.1	118.1	-3.0
1965.....	124.9	123.4	+1.6
1966 estimate.....	143.0	140.0	+3.0
1967 estimate.....	158.0	158.0	-----

NOTE.—See table 1 for possible adjustments to the expenditure and surplus/deficit figures.

To mollify those who anticipate a projection of the Federal budget table 5 is offered, probably as a sacrifice on the altar of convention. No doubt it should be kept out of the reach of children and appropriately labeled as to its possibly being injurious to the health, financial in this case. It can be seen that I am projecting a relatively small surplus in the statement of Federal receipts and expenditures in the income accounts in calendar year 1966 and approximate balance in 1967—on the official basis. I have used poetic license in labeling these guesses as "estimates."

A few comments on the details of the projections may be in order. On the revenue side, I have attempted to take account of the scheduled continuation of the speedup in the payment of the corporate income tax. For example, in the current year, large corporations are paying about 116 percent of their normal annual liability (42 percent of their 1965 liability and 74 percent of their 1966 liability). In 1967, the speedup continues, with these companies paying approximately 126 percent of normal annual liability (the remaining 26 percent of their 1966 liability plus 100 percent of their 1967 liability). Thus, they will be on a pay-as-you-go basis for the calendar year 1968 as a whole.⁴

On the expenditure side, the bulk of the recently enacted increases in the various Great Society programs is reflected primarily in rising transfer payments and grants-in-aid to state and local governments. Relatively small proportions of these education, housing, and anti-poverty programs result in Federal purchases of goods and services. The greater part of these purchases and virtually all of the recent increases are in connection with military and related national security programs.

On the face of it, it would appear that the trend is for a slight reduction in Federal fiscal restraint in 1967. As you must know by now, I do not believe that it will work quite that way. If we had the data to project the adjustment for defense obligations, I believe that the results would be a Federal deficit on income and product account in 1966 and a smaller deficit in 1967, thus indicating an abatement in the inflationary pressures directly resulting from the Vietnam buildup.

DEALING WITH INFLATION

Some important policy implications flow from all this. A general tax increase taking effect some time in 1967 may be too late to deal effectively with the inflationary pressures of the Vietnam buildup and of limited usefulness in dampening a wage-price or cost-push inflation. It might also coincide with some of the belated impacts of this year's tight monetary policy, especially in its effect on business investment.⁵ Thus, a tax increase now might relieve guilt feelings for not having enacted one in January, but mere confession of error might be more helpful.

Given the continued speedup of Federal revenue collections, assuming that our diagnosis of the economic impact of defense spending is approximately correct, and given the softness or slowing down in many private areas of demand, 1967 may be the year that—one way or another—they lower the boom.

⁴ Hence, *ceteris paribus*, a reduction in Federal corporate income tax receipts may occur in 1968.

⁵ Cf. John Kareken and Robert M. Solow, "Lags in Monetary Policy: A Summary," in Warren L. Smith and Ronald L. Teigen, editors, *Readings in Money, National Income and Stabilization Policy*, 1965, pp. 76-80

1966—YEAR OF EXCESSIVE DEMANDS AND THEIR CONTROL*

Nineteen sixty-six was the sixth consecutive year of expansion in spending and production. In each year since 1960 total demand for goods and services has risen rapidly enough to reduce the proportion of workers unemployed and the proportion of plant capacity unused. The year 1966 differed from the previous five, however, in several significant respects.

Aggregate demand for goods and services was excessive during most of the year. In the 1961-64 period demand rose sufficiently to bring the economy steadily closer to its potential output and, on the whole, in a moderate and orderly fashion, avoiding the creation of undue problems of resource allocation and inflationary pressures. During 1965 there was a much more rapid growth of total demand, accompanying the acceleration of activity in Vietnam, but most of the rise was matched by an increase in output. During most of 1966 the rise in demand continued to be rapid and significantly outpaced the ability of the economy to produce.

The year 1966 was one of inflation. During the first 4 years of the business expansion, sales and production rose in parallel fashion, and overall prices changed little on balance. Beginning about mid-1965 total demand rose more vigorously than real output, and rises in price indexes became notable. In 1966 demand continued to rise rapidly, and, with the economy at virtual capacity, about half of the rise was translated into higher prices.

Federal budget policy was more stimulative to total demand in the last half of 1965 and in 1966 than it had been in over a decade. From a relatively restrictive stance in 1960 budget policy became progressively more expansionary through tax cuts, additional welfare programs, and acceleration of the war in Vietnam. Such developments are believed to have been major forces in the growth of total demand from an inadequate level in the early 1960's to the excessive level of 1966.

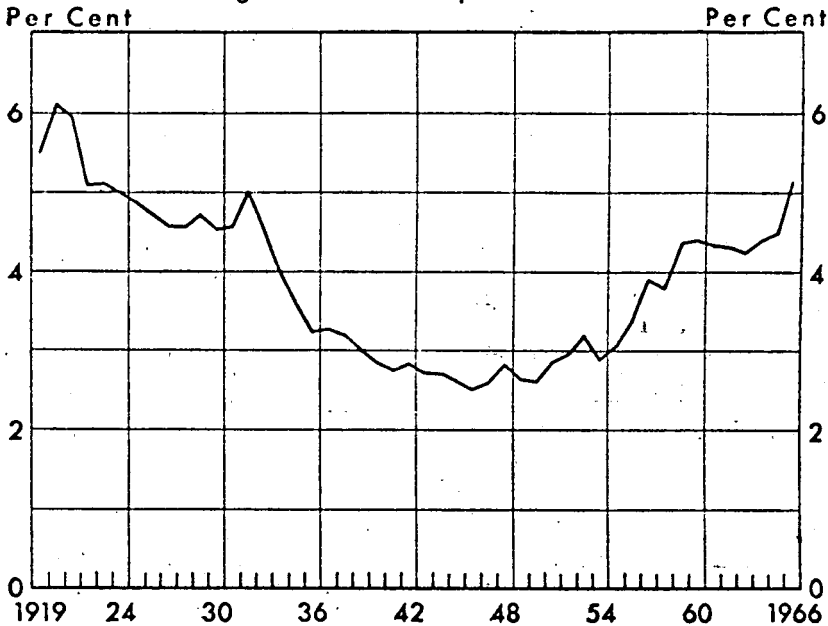
Monetary trends changed markedly during the year. In mid-1960, several months before the cyclical upturn, the money stock began rising moderately, at about a 3-percent annual rate compared with an average 2-percent rate in the previous decade, and continued to rise at this pace until mid-1964. From the summer of 1964 to the spring of 1965 money rose at an expansionary 4-percent rate, and from the spring of 1965 to the spring of 1966 it went up at a very stimulative 6-percent rate. This marked expansion was probably a significant factor in the strong rise in total demand during 1965 and 1966. From April through November money declined on balance, acting as a restraining force on total demand in the last half of 1966.

Interest rates rose rapidly from mid-1965 to the spring of 1966 and then spurted yet more rapidly until September, reaching the highest levels in over thirty years. Higher yields were reflected in a decline of bond prices and exerted a depressing influence on the value of common stocks, real estate, and other capital assets. The rise in

*Reprinted from Federal Reserve Bank of St. Louis Review, December 1966.

rates resulted primarily from a huge demand for funds accompanying Federal budget policy and the strong demand for goods and services. Since yields on market securities rose much more than interest rates offered by banks and savings and loan associations, a greater share of the public's funds than in many years flowed directly from savers to investors without passing through an intermediary.

Interest Rates Highest Grade Corporate Bonds



Source: Moody's Investors Service
Latest data plotted: 1966 estimated

The nation's balance of payments with other countries deteriorated in some major respects but improved in others. On the one hand, the strong domestic demands for goods and services, the higher prices in this country, and the shortage of some items domestically caused a jump in our imports and a marked reduction in our trade surplus. On the other hand, the higher interest rates in this country were helpful in reducing the net outflow of capital and money market funds from the United States. For a fuller analysis and some background on the balance-of-payments problems, see "1966 Balance of Payments in Perspective," on page 17 of this Review.

In late 1966 there were indications that the increase in total demand was moderating. Spending was less buoyant, credit demands were less vigorous, and interest rates receded from the peaks reached in the early fall. The abrupt shift in the thrust of monetary variables, which turned from expansion to restraint in the spring of 1966, may have been a major restraining force on total demand later in the year.

Total demand serves as a convenient theme for analyzing economic conditions. All of the above developments, together with many

others, were related to the excessive total demands for goods and services during 1966. This article examines: (1) public policy factors affecting the demands; (2) the resulting demands for goods and services and the accompanying rises in production, employment, and prices; (3) credit and interest rate developments; and (4) some economic trends, prospects, and choices developing in late 1966.

PUBLIC POLICY FACTORS AFFECTING TOTAL DEMAND

The two chief factors influencing the course of spending are fiscal and monetary developments. Some analysts see fiscal policy as dominant, while other view monetary policy as more effective. Direct Government spending and taxing are commonly thought to play more important roles in determining total demand than their size might indicate for two reasons: (1) Government spending and taxing are based largely on political, military, and welfare considerations and are not directly a function of current or expected income; and (2) a one dollar change in Government spending or taxing will generally lead to more than a one dollar change in total spending because of the effects on disposable incomes of consumers and businesses, which, in turn, influence their spending.

Monetary actions may have as great or greater impact on economic activity. Changes in the stock of money held by individuals and businesses relative to their desire to hold it as an asset influence spending. Linkages between money and spending may be through such variables as interest rates, credit availability, and liquidity.

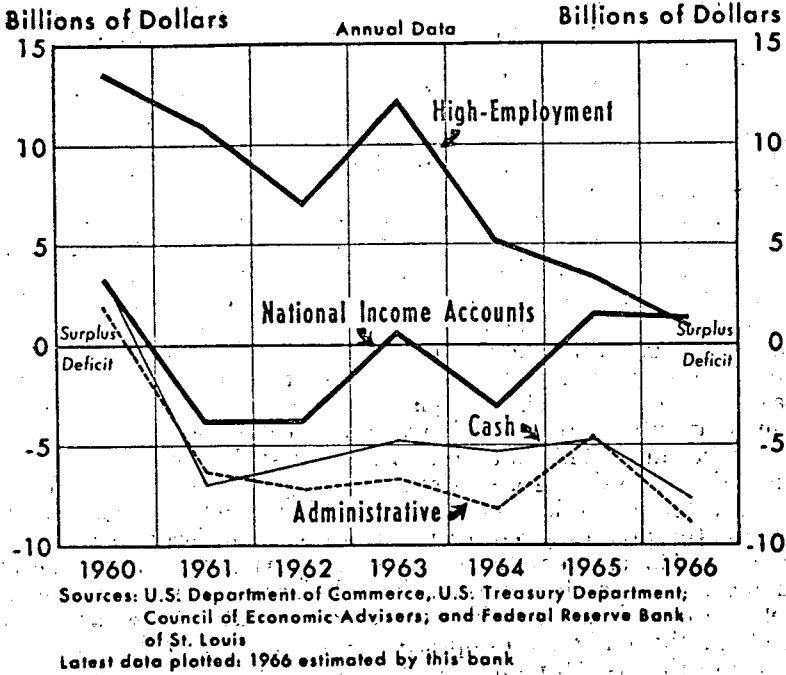
FISCAL DEVELOPMENTS

Since mid-1965 the U.S. Government, through its current taxing and spending programs, has exercised a strongly stimulative influence on total demand for goods and services. The overall relation between tax rates and the provision for expenditures has been the most stimulative in over a decade. At the same time, total tax receipts of the Government have been rising rapidly, largely because of the growth in private incomes. As a result, the total impact of the Federal budget, including the effect of the so-called automatic stabilizers, has been less stimulative than current programs alone would indicate.

Recent Federal Government fiscal developments may be examined in the light of alternative ways of measuring receipts and expenditures of the Federal Government.¹ There are four budgets of the Government in common usage. The administrative budget is the basic planning document of the Government. The cash budget measures the cash flow between the Government and the rest of the economy. The national income accounts budget summarizes the receipts and expenditures of the Federal Government sector as an integrated part of the recorded activities (i.e., the national income accounts) of all sectors of the economy. The high-employment budget is an estimate of the national income accounts budget which would prevail at a specified rate of resource use.

¹ For a fuller discussion of various budget measures, see Keith M. Carlson, "Budget Policy in a High-Employment Economy," in the April 1966 issue of this *Review*.

Federal Budgets



On an *administrative budget* basis, the deficit rose from \$4.6 billion in calendar 1965 to an estimated \$8.9 billion in 1966. (See table on p. 548.) This budget is the basic planning document of the Government but has serious shortcomings as a measure of impact on the economy (as noted below in the discussion of other budgets). Expenditures are estimated at \$119 billion in 1966, up 17 percent from \$101 billion in 1965. Spending for national defense, reflecting the acceleration of war in Vietnam, rose from about \$53 billion in 1965 to an estimated \$65 billion in 1966. Other outlays increased from \$49 billion to roughly \$54 billion, reflecting pay increases to Government employees and other price increases and new welfare programs. Net budget receipts increased from \$97 billion in 1965 to an estimated \$110 billion in 1966, or 14 percent, as incomes and profits rose, excise tax rates were increased, and tax collections were accelerated in a move toward a pay-as-you-go system.

The *consolidated cash budget* also indicated a greater net Government deficit in 1966 than in 1965, rising from \$4.5 billion to an estimated \$7.5 billion. The cash budget, which includes the activities of Government trust funds, provides a broader measure than the administrative budget of the cash flow between the Government and other sectors of the economy. Cash receipts of the Government rose from \$123 billion in 1965 to an estimated \$145 billion in 1966, 17 percent. Higher social security tax rates were a factor causing the greater rise in receipts on a cash basis than on an administrative basis. Cash payments to the public went up 19 percent, from \$128 billion in 1965 to an estimated \$152 billion in 1966. Medicare payments and more

liberal social security benefits as well as the greater outlays included in the administrative budget were chief causes of the increase.

The *national income accounts budget* is a broad measure relating the Federal Government sector to the consumer, business, state and local government, and international sectors of the national income and product accounts. It reflects the impact of current changes in tax rates and provisions for expenditure by the Government as well as the built-in stabilizing effects of existing laws as applied to changing economic developments.²

On the national income accounts basis, the budget has shown a surplus at an average annual rate of about \$0.4 billion during the past 18 months. This was less stimulative than in the period 1961-64, when the deficit averaged a rate of \$2.5 billion. This measure of Government action, which indicates about the same stance in 1966 as in 1965, is generally thought to be a better indication of the relationship of the Government to total spending than either the administrative or cash budget. The national income accounts budget is designed to include only factors which have a direct impact on the flow of current income. This is accomplished by such devices as excluding transactions in existing assets and accruing tax receipts. The somewhat greater restriction indicated by this budget for 1965 and 1966 than for the preceding 4-year period resulted in large part from the impact on Government tax receipts of the rise in economic activity and incomes—the chief automatic stabilizer. In view of the high level of economic activity and the excessive rate of increase in total spending, the budget appropriately should have registered a large surplus in the last 18 months if it were the act as a restraining force on total spending.

The *high-employment budget* indicates the influence of changes in tax rates and in provisions for Government expenditures upon the national income accounts budget and abstracts from the major built-in stabilizer effects. It is thus a better measure of changes in fiscal policy.

On a high-employment budget basis the Government operated at a surplus of about \$0.5 billion annual rate in the 18 months from mid-1965 to the end of 1966. This was the smallest surplus, and therefore the most stimulative, in over a decade. Figures presented in this budget are hypothetical, but relative levels are believed to provide the best single measure of the relative impact on the economy of current Government fiscal actions. The high-employment budget differs from the national income accounts budget primarily by eliminating the effect of changes in economic activity on Government receipts. It measures the impact of changes in tax laws and legal provision for expenditure, at an assumed rate of use of resources, rather than actual tax receipts and expenditures.

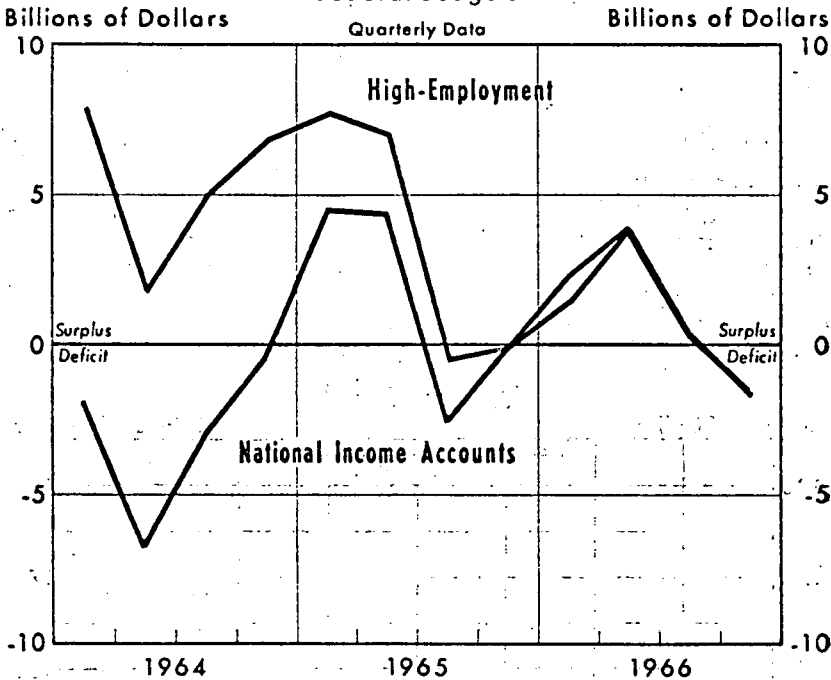
Government tax and expenditure policies as measured by the high-employment budget were a substantial drag on total spending in 1960, were moderately and on the whole increasingly stimulative

² Differences of opinion exist as to whether it is better to include or exclude the effect of automatic stabilizers in analyzing fiscal policy. There is an extensive literature on the value of the automatic stabilizers. However, since the impact of these stabilizers is chiefly determined by developments in the private sectors, others believe that these movements may be misleading. The differences of opinion are similar to those of deciding whether to use interest rates and free reserves (which are influenced by both the monetary authorities and demands for credit in the rest of the economy) or to use aggregate reserves and money (which are controlled by the monetary authorities) in measuring monetary actions.

from early 1961 to early 1965, and became very stimulative in late 1965. The marked shift in the posture of the Government since 1960 resulted from the investment tax credit and liberalized depreciation guidelines in 1962, tax cuts in 1964 and 1965, increasing expenditures for the Vietnam conflict, and greater outlays on welfare programs.

Fiscal Measures

Federal Budgets



Sources: U.S. Department of Commerce, U.S. Treasury Department, Council of Economic Advisers, and Federal Reserve Bank of St. Louis
 Latest data plotted: 4th quarter estimated by this bank

Government actions were probably even more stimulative in late 1965 and early 1966 than indicated by the high-employment budget. Government outlays are recorded in this budget when goods are delivered; yet the economic impact begins soon after orders are placed. The defense buildup was accelerating rapidly because of the war in Vietnam. Contracts were let in great volume, production increased markedly, and employment rose, but deliveries of goods were relatively small in the early months of the buildup.³

Government debt-management operations were also expansionary during 1966. Because of the legal maximum interest rate of 4¼ percent on new issues with maturities of over five years, the Treasury was forced to finance with relatively short-term issues, adding to the liquid assets of the public. Average maturity of the publicly held Federal debt declined from 63 months in 1965 to less than 59 months in the January-October 1966 period.

³ A detailed analysis of this effect was presented by Murray Wiedebaum in a paper entitled "The Federal Budget and the Outlook for Defense Spending" at the University of Michigan Economic Outlook Conference on Nov. 18, 1966.

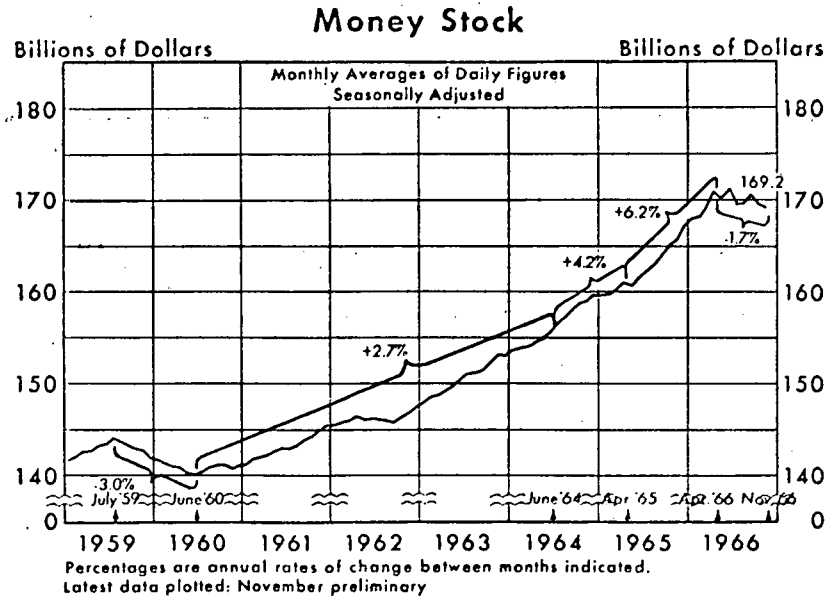
Economic analysis during the past two or three decades has generally indicated that fiscal policy is the major public policy influence on total demand. Judged by this view, public policy has been extremely stimulative during the past 18 months. Recent economic analysis has put increasing emphasis on monetary policy as a major determinant of total demand.

MONETARY DEVELOPMENTS

Monetary expansion was rapid from mid-1964 to the spring of 1966 and then came to an end. Both member bank reserves and the money stock, which had been rising sharply, showed net declines from April to November. Typically, changes in these monetary variables have had their greatest impact on economic activity after a brief timelag.

Monetary developments are measured variously by changes in the stock of money, interest rates, bank credit, and other measures. For the sake of simplicity and because it is a widely used policy indicator, particular attention is given here to changes in the stock of money.

The money stock (demand deposits and currency) has decreased at an annual rate of 1.5 percent since last spring after increasing 6 percent in the preceding year and at a 4-percent rate from mid-1964 to April 1965. From mid-1960 to mid-1964 money rose at a 3-percent rate, and in the 1950's, at a 2-percent rate.



"A NOTE ON INTERPRETING MONETARY VARIABLES"

As the Nation's central bank, the Federal Reserve System has responsibility for managing the monetary system in a way that helps achieve the broad goals of economic policy. While the general nature of the role of the Federal Reserve in monetary management is not difficult to explain, it is difficult to explain the specifics of how that role should be performed: for example, how monetary policy should be designed, how the variables to be influenced should be selected, and how the results should be measured. One fundamental and practical problem involved is the presentation, use, and measurement of basic statistical information.

The sharp expansion in the money stock from mid-1964 to early 1966 was probably a significant factor in the rapid rise of spending

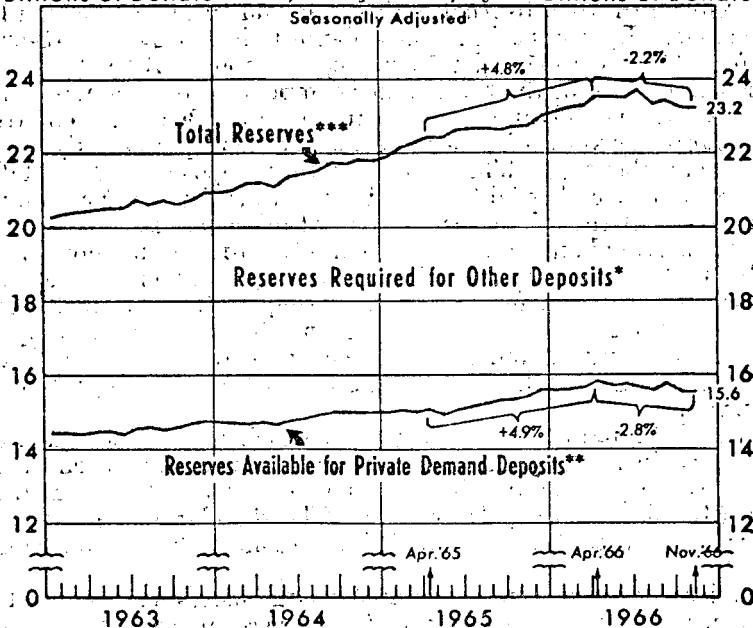
during 1965 and early 1966. To the extent that actual cash balances exceed desired cash balances, upward pressures are placed on spending. Evidence indicates that changes in the rate of spending have usually followed marked and sustained changes in the rate of growth of the money stock after a few months' lag.⁴ The decline in money since April has probably exerted a restraining influence on aggregate demand in late 1966.

The demand deposit component of money has declined at a 3-percent annual rate since spring following a 5-percent rate rise from mid-1964 to spring 1966. By contrast, the currency component has increased at a 4-percent rate since spring, compared with a 6-percent rate in the preceding period. The amount of currency held is probably related to the volume of transactions which typically utilize currency. Changes in the rate of growth of currency have tended to coincide with movements in total spending or to lag slightly behind them. Rates of growth of demand deposits have been related to changes in member bank reserves available for private demand deposits. Marked and sustained changes in the growth rates of demand deposits have usually preceded changes in economic activity.⁵

Changes in the money stock have reflected in large measure changes in member bank reserves. Member bank reserves (adjusted for

Reserves of Member Banks

Billions of Dollars Monthly Averages of Daily Figures Billions of Dollars



*U.S. Government demand deposits, deposits due to domestic commercial banks, and time and savings deposits.

**Deposits of member banks included in the usual definition of the money supply.

***Adjusted for estimated effect of reserve requirement changes.

Percentages are annual rates of change between months indicated.

Latest data plotted: November preliminary

⁴ See "Money Supply and Time Deposits, 1914-1964," in the September 1964 issue of this Review.

⁵ See "Currency and Demand Deposits," in this Review, March 1965.

changes in reserve requirements) declined at about a 2-percent annual rate from April to November this year. Reserves, which are composed of deposits with Reserve banks and cash in bank vaults, are the major determinant of the level of demand deposits. From April 1965 to April 1966 bank reserves rose about 5 percent. By comparison, reserves increased at a 4-percent rate from 1960 to 1965 and at an average rate of about 2 percent per year in the 1950's.

The rapid expansion of reserves from mid-1964 to the spring of 1966 resulted from Federal Reserve System net purchases of Government securities totaling \$6 billion and an increase of \$400 million in member bank borrowing from Reserve banks. Partially offsetting factors were a movement of currency into circulation and net sales of gold by the U.S. Treasury. The decline in effective reserves since last spring has reflected both a rise in reserve requirements on time deposits and a slower rate of net purchase of Government securities by the System.

Reserves available to support private demand deposits (total reserves less reserves required for deposits not counted as part of the money supply) have decreased at a 3-percent rate since spring after increasing 5 percent in the preceding year. These reserves rose at a 1.5-percent rate from 1960 to 1965, about the same as in the 1950's. Movements in private demand deposits and the money stock are usually more closely associated with these reserves than with total reserves.

Time deposits in commercial banks rose at a 10-percent annual rate from November 1965 to August this year and since have shown little net change. By comparison, these deposits increased at a 15-percent rate from 1960 to 1965 and a 7-percent rate from 1951 to 1960.

Growth of each of the three major components of commercial bank time deposits has followed a different course in 1966. Recent trends are most exactly known for the large banks which report weekly. These banks hold about \$88 billion of total time deposits of \$157 billion. Divergence of trends of different kinds of time deposits has probably been greater at these large banks than at other banks.

At these large banks passbook savings deposits, which now amount to about \$47 billion, have declined at an 8 percent annual rate since last December after rising 11 percent during 1965. The chief cause of the changed trend was that with higher interest rates on competing instruments banks found more difficulty in attracting and holding passbook accounts at the Federal Reserve's Regulation Q rate ceiling of 4 percent.

Large CD's (certificates of deposit), which rose 12 percent in the year ended in August and had increased about a third each year for several earlier years, have since declined at a sharp 50-percent rate to about \$15 billion in early December. The Regulation Q maximum of 5½ percent on these funds has made it increasingly difficult for banks to hold them.

Smaller, consumer-type CD's at the large banks have risen 51 percent since a year ago compared with a 20-percent rate earlier in 1965. Recently these deposits have amounted to about \$26 billion. The recent rapid growth rate of these deposits reflected increased bank aggressiveness in seeking these funds for which regulations permitted payment of effectively competitive interest rates. Since September of this year, when the maximum rate on these CD's was lowered from 5½ to 5 percent, the amount outstanding has changed little on balance.

Money stock plus time deposits at all commercial banks declined somewhat from September to November after growing at a 4-percent rate from June to September, at a 9-percent rate from March 1965 to June 1966, and at an 8-percent rate from 1961 to 1965. In the 1950's this broader measure of money went up at an average 3.4-percent rate.

A particular net stimulative or restrictive effect on the economy may be obtained with various mixes of monetary and fiscal policies. During most of 1966 the particular combination of policies prevailing was one of relatively expansive fiscal developments and relatively restrictive monetary actions. This mix required larger borrowing by the Federal Government and a lesser growth in money than a mix with more restrictive fiscal action and less restrictive monetary action and tended to place upward pressure on interest rates. The higher rates were of some benefit in keeping the country's balance of payments from deteriorating since they reduced the incentive to seek higher rates abroad. On the other hand, higher interest rates adversely affect some sectors of the economy, such as housing.

FEDERAL RESERVE SYSTEM ACTIONS DURING 1966

*Federal Reserve credit*¹

	Annual rates of change	
	December 1965-April 1966	April 1966-November 1966
	Percent	Percent
Federal Reserve credit ²	+9.3	+3.2
Federal Reserve holdings of U.S. Government securities.....	+8.0	+3.4
Total reserves of member banks.....	+6.9	-2.3
Reserves available for private demand deposits.....	+4.1	-3.1

¹ Adjusted for reserve requirement changes.
² Federal reserve credit excluding float and a few minor items.

Discount rate

	Percent
In effect Jan. 1, 1966.....	4½
In effect Dec. 20, 1966.....	4½

Reserve requirements

	Percent of deposits				
	Demand deposits		Time deposits, all member banks		
	Reserve city banks	All other member banks	Savings deposits	Other time deposits	
				Up to \$5,000,000	In excess of \$5,000,000
In effect Jan. 1, 1966.....	16½	12	4	4	4
July 14, ¹ 21, ² 1966.....					5
Sept. 8, ¹ 15, ² 1966.....					6
In effect Dec. 20, 1966.....	16½	12	4	4	6

¹ Effective date for reserve city banks.
² Effective date for all other member banks.

Margin requirements on stocks

	<i>Percent</i>
In effect Jan. 1, 1966.....	70
In effect Dec. 20, 1966.....	70

Maximum interest rates payable on time and savings deposits

	Savings deposits	Other time deposits, 30 days or more maturity	
		Under \$100,000	\$100,000 or more
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
In effect Jan. 1, 1966.....	4	5½	5½
Sept. 26, 1966.....	4	5	5½
In effect Dec. 20, 1966.....	4	5	5½

LOAN POLICY

On September 1, 1966, the presidents of the Federal Reserve banks sent a letter to all member banks regarding growth in overall bank credit, the increase in business loans, and administration of Federal Reserve credit assistance to member banks through the System's discount facilities. Excerpts from the letter are as follows:

"* * * credit financed business spending has tended towards unsustainable levels and has added appreciably to current inflationary pressures * * * [This] expansion is being financed in part by liquidation of other banking assets and by curtailment of other lending in ways that could contribute to disorderly conditions in other credit markets * * * Member banks will be expected to cooperate in the System's efforts to hold down the rate of business loan expansion * * * and to use the discount facilities of the Reserve Banks in a manner consistent with these efforts. * * *"

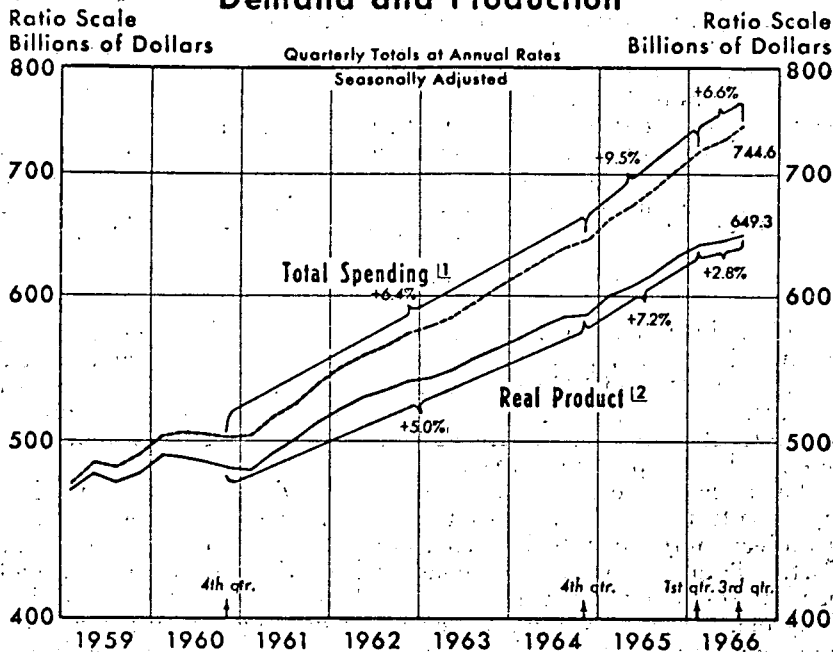
DEMAND, PRODUCTION, AND PRICES

DEMAND

The demand for goods and services was very strong in 1966, although it declined moderately from the exceptionally high 1965 rate. Total dollar spending, which had risen at a very rapid 9-percent annual rate from late 1964 to early 1966, grew at a somewhat more moderate 7-percent rate from the first to the third quarter of 1966. These rates of increase in spending were substantially above the estimated 4-percent rate of growth of productive potential. The stimulative fiscal actions during 1965 and 1966 and the rapid monetary expansion from the summer of 1964 to the spring of 1966 contributed to the large demand for goods and services of the past 2 years.

The growth pattern of spending changed markedly during 1966. Private investment, which had risen at a 15 percent annual rate from the third quarter of 1964 to the second quarter of 1966, declined in the third quarter of 1966. Outlays on housing declined from \$27.8 billion in 1965 to an annual rate of \$24.8 billion in the third quarter of 1966. Since housing is consumed over a relatively long period, current spending on new construction can be curtailed without greatly reducing the amount of housing services available. Since interest cost is usually a major portion of the total expense of owning a home, higher interest rates increase the effective price of house services more than the price of consumer goods in general. Consequently, the amount of housing demanded declines greatly.

Demand and Production



Percentages are annual rates of change between quarters indicated.
 1 GNP in current dollars.
 2 GNP in 1958 dollars.
 Source: U.S. Department of Commerce
 Latest data plotted: 3rd quarter

Inventory buying continued large in the first half of 1966 but added little to increased total demand. Net purchases of business inventories during the first half of 1966 (\$10.6 billion rate) remained close to the fourth quarter 1965 rate (\$10.4 billion). Inventory purchases rose rapidly in 1965 from \$4.7 billion in 1964, reflecting both the greater flow of goods in the private economy and the buildup of war goods for Vietnam. In the third quarter of 1966 inventory buying declined slightly, to a \$9.9 billion rate. Factors in the slowdown may have been the higher costs of credit, unavailability of some items, and the greater delivery of war goods to the Defense Department relative to production of these items.

Business spending on plant and equipment, in contrast to inventory investment, continued to rise during 1966. These outlays increased at an estimated 15-percent rate in the first three quarters of 1966 compared with an average 9-percent rate in the previous 5 years. Profit anticipations were optimistic, and demands for defense goods were great. Interest costs, although up nominally, did not impose much restraint on demand since growing inflationary pressures led to expectations that repayments would be made in cheaper dollars.

Government expenditures jumped at an average 14 percent annual rate during the first three quarters of 1966 compared with growth at about a 9-percent rate from late 1964 to late 1965 and a 5-percent rate from 1962 to 1964. Defense outlays accounted for most of the

gain, but welfare programs of the Federal Government and spending by State and local governments continued to rise.

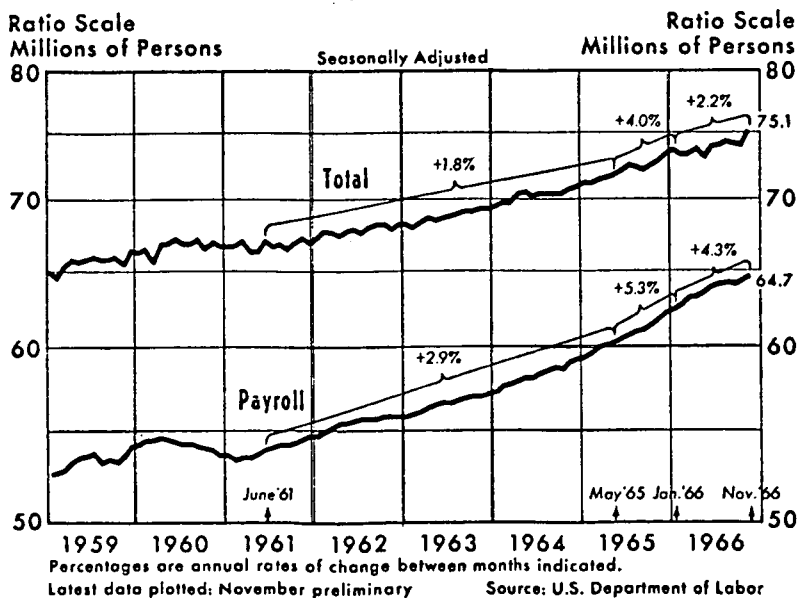
Consumer outlays, which rose at about a 9-percent rate from late 1964 to early 1966, increased at a 6.4-percent rate in the second and third quarters of 1966. The slower rate was caused primarily by a decline in durable goods purchased during the second quarter as automobile sales decreased, reflecting higher excise taxes, greater withholdings for personal income taxes, and discussions of automobile safety. Nevertheless, personal income, a measure of purchasing power, has continued to rise at about an 8-percent rate in 1966.

PRODUCTION AND EMPLOYMENT

Growth in real output of the economy slowed in 1966, trending downward from a 7-percent growth during 1965 to a 6-percent rate in the first quarter of 1966 and a 3-percent rate in the second and third quarters. By comparison, output rose at an average rate of 5 percent from late 1960 to late 1964. Productive potential is estimated to increase about 4 percent a year.

The reduced rate of growth in production during 1966 resulted in large part from resource limitations and from problems of readjustment as the economy ran into bottlenecks and shifted to greater military effort. Total demands for goods and services were strong, and spending rose about twice as fast as production, causing prices to rise. Many plants were at virtual capacity, and shortages of skilled workers were widespread. When a high rate of resource use is achieved in the economy, the rate of increase of total real product necessarily falls back to about the rate of growth of productive potential.

Employment



Total employment, after growing at about a 4-percent annual rate in the last half of 1965, rose at about a 2-percent rate in the first 11 months of 1966. This shift is accounted for by the exhaustion of the supply of employable labor and the flow of manpower into the armed forces. From 1961 to 1965 the 2-percent rate of increase of employment was much greater than the 1.3-percent rate of growth of population of working-force age (18 to 64 years). In 1966 the gain in employment approximated the 1.6-percent growth of this population group. Since the number of men in the labor force has recently increased little, growth of employment has been dependent in large measure on entrance of women into the labor force.

Unemployment was at a relatively low level during the year. Over 98 percent of the married men looking for work had jobs in the first 11 months of 1966 compared with 97.6 percent in 1965 and 95.4 percent in 1961. A large portion of married men out of work in 1966 could be accounted for by seasonal unemployment, those changing jobs, and those without skills or aptitudes marketable at prevailing wage rates.

Total unemployment was about 4 percent of the labor force in the first 11 months of 1966 compared with 4.6 percent in 1965 and 6.7 percent in 1961. The paradox of about one in 25 of those wanting a job being idle at a time of strong labor demand may be partially explained by minimum wage laws. Unemployment was greatest among those without skills or experience and with little education, particularly those in the 14 to 18 age group. The value of the product of many of these workers is less than the legal minimum wage, and incentives are great for firms to avoid engaging in activities for which these workers are fitted or to replace such workers through automation.

PRICES

Inflationary pressures erupted during 1966. More than half of the rise in total spending was translated into higher prices and less than half was matched by increases in goods and services. By comparison, in the previous year about 20 percent of the rise in spending resulted in higher prices, and 80 percent was matched by additional output.

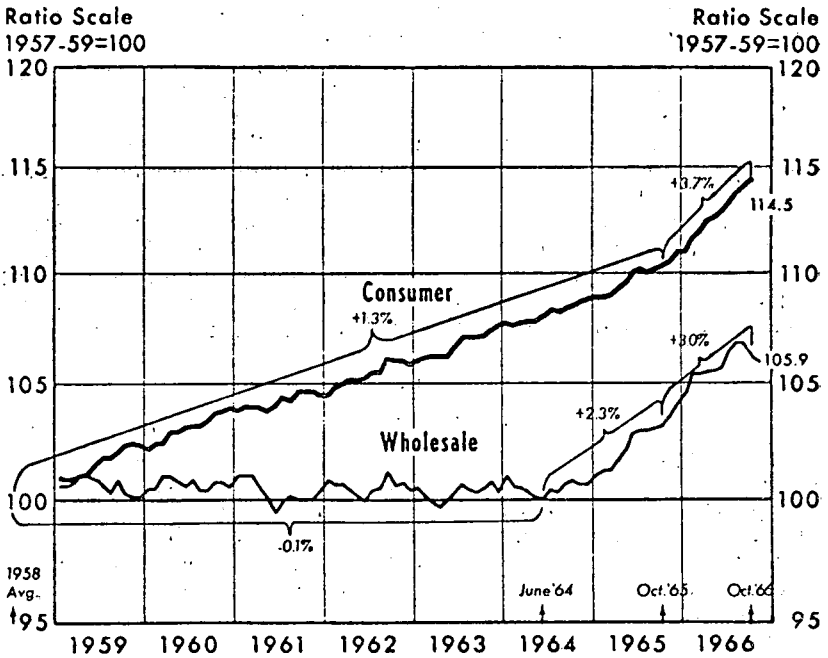
Higher prices reflected primarily demands for goods and services exceeding the economy's ability to produce with the given supply of land, labor, capital, and technology. Price rises tended to be sharpest in areas where goods and services were in shortest supply relative to demand. The transfer of resources from private production to build war supplies in late 1965 and in 1966 was accomplished primarily by bidding up wages and other prices.

Prices of consumer goods moved up sharply. From late 1965 to October 1966 average consumer prices rose at a 3.7-percent annual rate after going up at a 1.3-percent rate from 1958 to the fall of 1965. The acceleration of price increases may have been even greater than implied by these figures. In the earlier period, quality improvements may not have been taken adequately into account, and the fixed market-basket approach did not allow for gains to consumers from substitute commodities. More recently, with strong demands for goods and with shortages developing, discounts have been eliminated, and there have been deteriorations in quality which may not have been recognized in computing the index.

Prices of most consumer items rose. Food prices went up at a sharp 5.4-percent rate in the first 10 months of 1966. Fees and charges for consumer services (excluding rent) also increased at a 5.4-percent rate. Rent and prices of nondurable goods other than food increased less rapidly. Prices of durable goods crept up slightly.

Wholesale quotations rose 3 percent from the fall of 1965 to the fall of 1966. By comparison, these prices increased at a 2.3-percent annual rate from mid-1964 to the fall of 1965 after being stable from 1958 to mid-1964. Wholesale prices of farm products and processed foods rose about 5 percent from the fall of 1965 to the fall of 1966, reflecting limitations of production, exhaustion of stocks, large demands for shipment abroad, and high personal incomes. Industrial prices rose 2.3 percent.

Prices



Percentages are annual rates of change between months indicated.
 Latest data plotted: Consumer-October
 Wholesale-November preliminary
 Source: U.S. Department of Labor

CREDIT AND INTEREST RATES

Accompanying the strong demand for goods and services, a substantial volume of credit was extended in 1966. With incomes high and rising during 1965 and 1966, the amount of private savings was large, and monetary expansion was very rapid during much of this period. The demand for funds was even stronger in response to optimistic business expectations and requirements of governments. The demand for credit apparently decreased somewhat after early September, and the flow of funds contracted.

Commercial bank credit rose at a 10-percent annual rate from November 1964 to August 1966 compared with an 8-percent rate in

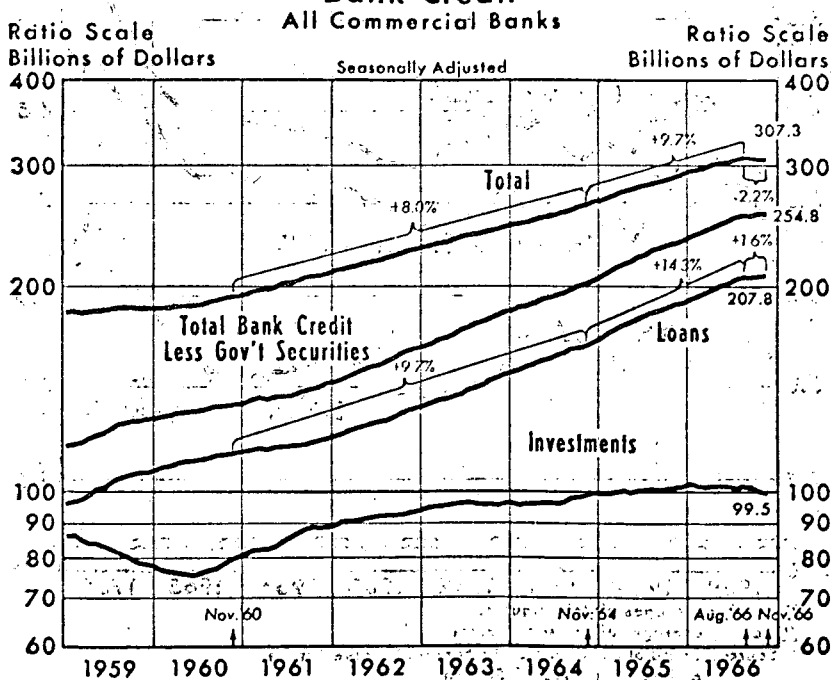
the economic upswing from late 1960 to late 1964 and a 4-percent average rate in the late 1950's. From August to November this year such credit declined at a 2-percent rate:

Strength centered particularly in business loans, which increased 18 percent from August 1965 to August 1966. From August to November these loans increased at only a 7-percent annual rate. Banks purchased municipal securities at a 12-percent rate from September 1965 to June 1966; from June to November these holdings were reduced at a 1-percent rate. Bank real estate loans increased at a 13-percent rate from January 1965 to March 1966 and then at a reduced 8-percent rate from March to November. The rate of increase of bank loans to consumers declined from 14 percent in the year ending in April 1966 to 8 percent in the April-September period and then to 4 percent from September to November.

The rate of increase of consumer instalment credit outstanding both at commercial banks and elsewhere has declined significantly since a year ago. After increasing at a rate of 12 or 13 percent a year in 1964 and 1965, this credit grew at an 11-percent rate from December 1965 to March 1966, at a 10-percent rate from March to August, and at a 7-percent rate from August to October.

The decline in the rate of increase of total installment credit reflected primarily a considerably more marked decline in the rate of increase of automobile credit. After growing about 12 percent in 1964 and 15 percent in 1965, this credit expanded at a 10-percent annual rate from December 1965 to March 1966, at a 7-percent rate from March to September, and at a 5-percent rate from September to October.

Bank Credit

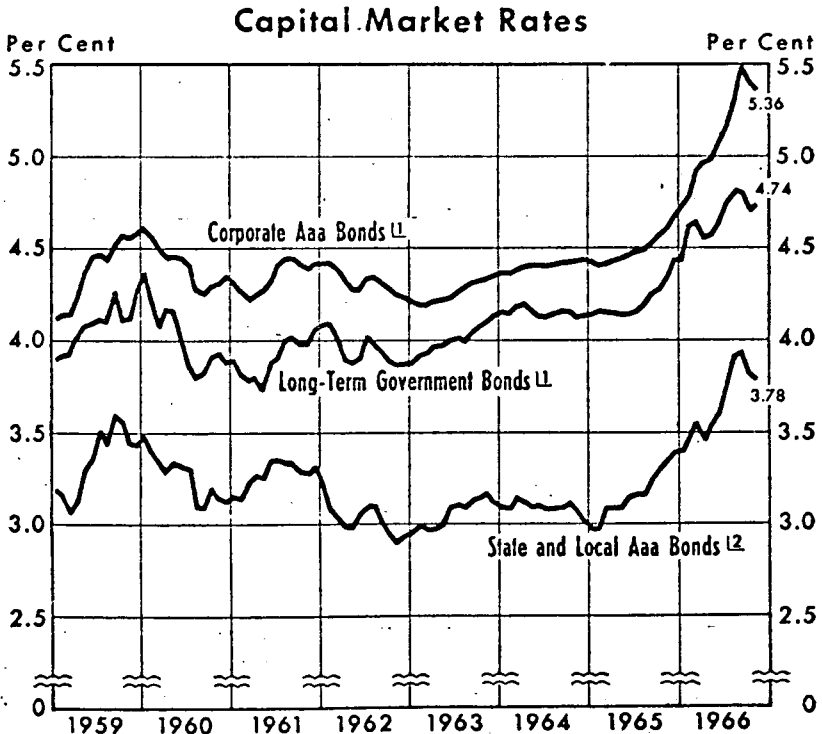


Percentages are annual rates of change between months indicated.
Latest data plotted: November

Interest rates rose markedly during the last half of 1965 and the first 4 months of 1966. After April the rate of increase accelerated, and by early fall most rates reached their highest levels since the 1920's. The rise reflected a sharper increase in the demand for credit than in the available supplies from saving and bank credit creation. The sharp upward movement in interest rates from April to September accompanied the initial period of monetary contraction.

From September 1966 to early December interest rates declined moderately. The decline in rates after September may reflect a decline in the fundamental demand schedule for loan funds. Alternatively, some of the rapid increase of the summer may have been primarily speculative because of inordinate expectations of still higher rates, and the October declines may have been of a technical nature. Responding to the high level of rates in the fall compared with the first half of the year, the declines of credit extensions may have reflected a decline in the amount of funds demanded rather than in the demand schedule.

Yields on highest grade corporate bonds, which had averaged 4.35 percent in the 1961-64 period and had risen to 4.50 percent by mid-1965, rose to 4.96 percent in April this year and then to 5.49 percent in September. Rates on Government bonds and on high-grade municipal bonds moved in a roughly parallel fashion.



Ⓛ Monthly averages of daily figures.

Ⓜ Monthly averages of Thursday figures.

Sources: Board of Governors of the Federal Reserve System
and Moody's Investors Service

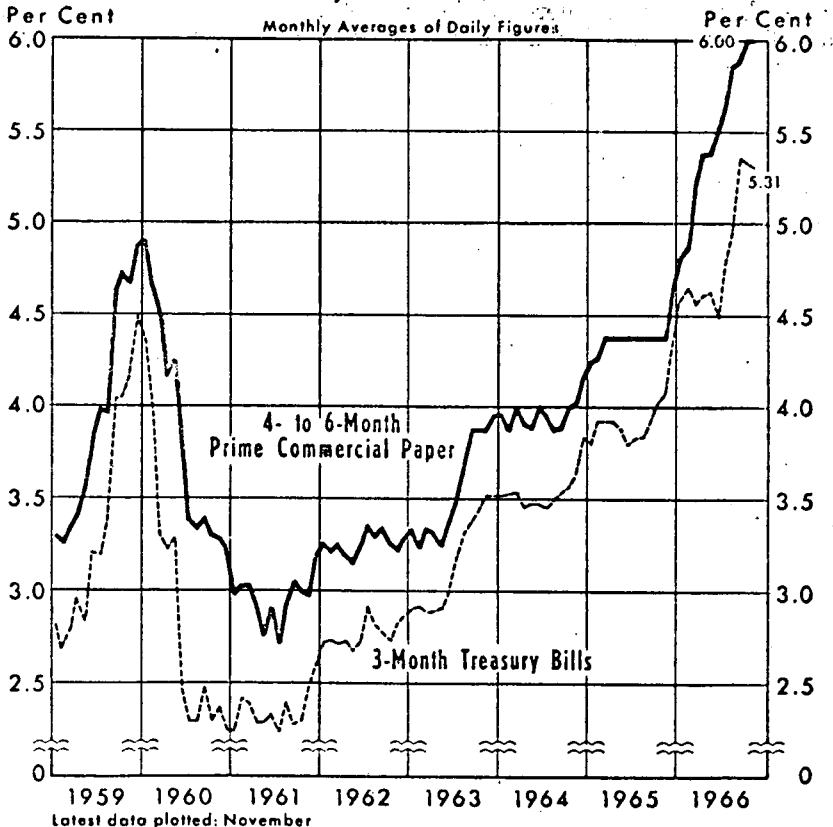
Latest data plotted: November

In the short-term market, yields on 3-month Treasury bills worked up from 2.35 percent in 1961 to 3.80 percent in June 1965, to 4.61 in April 1966, and to 5.36 percent in September. Quotations on prime 4- to 6-month commercial paper followed a similar course.

The higher interest rates were reflected in price declines for many capital assets. A rise in rates means lower prices on existing bonds and preferred stocks. A rise in rates also tends to push down the present value of a given expected return from real estate and common stocks.

Interest rates on market instruments rose more rapidly in 1965 and 1966 than did rates paid by financial intermediaries. Market yields quickly reflect changed demand and supply conditions, while rates paid by commercial banks on time deposits and dividends paid on savings and loan shares are much more rigid. Frequent moves in the latter rates are practically impossible. Since reduction of institutional rates offends customers, there is a reluctance to raise rates until it becomes clear that the higher level might be maintained for a period. Financial intermediaries have a further reluctance to increase their interest costs because new rates apply to previously obtained funds as well as to new funds and resources of an intermediary are invested in previously purchased lower yielding assets.

Money Market Rates



Supervisory authorities have used their influence to resist higher rates on funds supplied to intermediaries, fearing deterioration of lending and investing standards or responding to a public opinion that increases in such rates encourage higher general market interest rates. Maximum rates which commercial banks have been permitted to pay under Regulation Q have exercised a restraint on aggressive banks. In early September Regulation Q controls were tightened, limitations on rates paid by savings and loan associations were formalized while liberalized, and more formal restraints were placed on mutual savings banks.

An exceptionally small share of the total flow of funds went through financial intermediaries in 1966. In 1964 and 1965, 44 percent of the net sources of credit in the economy flowed through time and savings accounts of deposit-type financial institutions. In the first quarter of 1966 these institutions received 30 percent of available funds, and in the second and third quarters they received 26 percent. With market rates higher than interest rates paid by banks, savings and loan associations, and other intermediaries, there was an incentive for suppliers of funds to place them in stocks, bonds, commercial paper, and direct loans. This diversion tended to favor the larger suppliers of funds and the large borrowers, notably the U.S. Government, large State and municipal borrowers, and major businesses, which obtain funds in a national market. Smaller savers generally received lower rates than large suppliers, while less well-known borrowers, who must usually rely on local financial institutions, had fewer funds for which to compete.

Federal Government Budgets, seasonally adjusted annual rates

[Billions of dollars]

Quarters	Receipts				Expenditures				Surplus (+) or deficit (-)			
	Admini- strative budget ¹	Cash budget	National income accounts budget	High- employ- ment budget	Admini- strative budget ¹	Cash budget	National income accounts budget	High- employ- ment budget	Admini- strative budget ¹	Cash budget	National income accounts budget	High- employ- ment budget
1964:												
1	96.4	117.2	115.3	124.5	95.6	122.4	117.2	116.6	+0.8	-5.2	-1.9	+7.9
2	100.0	114.4	112.3	120.3	99.6	119.2	119.1	118.5	+0.4	-4.8	-6.7	+1.8
3	80.8	113.6	115.4	122.9	95.6	120.0	118.4	118.0	-14.8	-6.4	-3.0	+4.9
4	77.6	115.2	117.2	124.1	96.8	119.2	117.7	117.3	-19.2	-4.0	-0.5	+6.8
1965:												
1	97.2	118.9	124.0	126.9	91.6	120.7	119.6	119.2	+5.6	-1.8	+4.5	+7.7
2	117.2	130.6	125.0	127.3	102.0	129.6	120.6	120.3	+15.2	+1.0	+4.4	+7.0
3	88.8	122.4	123.8	125.6	102.8	128.4	126.3	126.1	-14.0	-6.0	-2.5	-0.5
4	84.0	122.8	126.9	126.9	109.2	132.4	127.0	127.0	-25.2	-9.6	-0.2	-0.1
1966:												
1	104.4	134.8	136.0	135.2	108.8	147.6	133.7	133.8	-4.4	-12.8	+2.3	+1.4
2	141.6	158.4	141.0	140.9	107.2	143.2	137.1	137.1	+34.4	+15.2	+3.9	+3.8
3	101.6	145.3	145.4	145.4	135.8	160.2	145.1	145.1	-31.2	-14.8	+3	+3
4	92.8	141.1	148.5	148.5	127.2	158.5	150.0	150.0	-34.4	-17.4	-1.5	-1.5
Calendar years:												
1964	88.7	115.0	115.1	123.0	96.9	120.3	118.1	117.6	-8.2	-5.2	-3.0	+5.4
1965	96.8	123.4	124.9	126.7	101.4	127.9	123.4	123.2	-4.6	-4.5	+1.6	+3.5
1966	110.1	144.9	142.7	142.5	119.0	152.4	141.5	141.5	-8.9	-7.5	+1.3	+1.0
Fiscal years (ended June 30):												
1964	89.5	115.5	115.5	124.8	97.7	120.3	116.9	115.7	-8.2	-4.8	-1.4	+9.1
1965	93.1	119.7	120.6	125.3	96.5	122.4	118.3	118.7	-3.4	-2.7	+2.3	+6.6
1966	104.6	134.4	131.9	132.2	106.9	137.6	131.0	131.0	-2.3	-3.2	+1.9	+1.2

¹ Not seasonally adjusted.

² Estimated.

Sources: U.S. Department of Commerce, U.S. Treasury Department, Council of Economic Advisers, and Federal Reserve Bank of St. Louis.

ECONOMIC TRENDS LATE IN THE YEAR

DEMAND

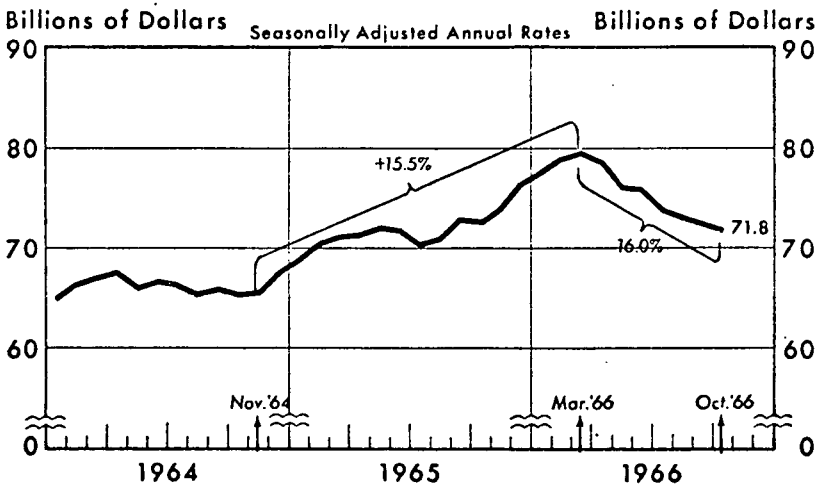
Available evidence indicates that the demand for goods and services may have moderated during the summer and fall. Total spending rose from the first to the third quarter at a 6.6-percent annual rate, down from the 9.5-percent rate of the preceding five quarters. (See chart, p. 8.) Whether, in view of resource bottlenecks and problems of shifting to more military production, there has been adequate reduction in the excessive demand of late 1965 and early 1966 remains to be seen.

Growth of several elements of total demand for goods and services has slackened considerably. The rate of growth of retail sales has declined from 13 percent in the last half of 1965 to 5 percent during the first half of 1966 and has since shown little net change. The increase in net business outlays for inventories, which was at a \$12 billion annual rate from the first to the second quarter, slowed to a \$10 billion rate from the second to the third quarter. Expenditures on new homes, which were about unchanged from the first to the second quarter, fell at an annual rate of \$5 billion from the second quarter to October. Large offsets to these declines have been provided by increasing Government outlays and by more business spending on equipment. Personal income, a measure of purchasing power, has been rising at about an 8-percent rate in recent months.

REAL OUTPUT

The rate of growth in real output has also declined. Total output, measured in constant dollars, increased 7 percent in 1965, at a 6-percent annual rate in the first quarter of 1966, and at a 3-percent rate from the first to the third quarter. Industrial production, which

New Construction



Latest data plotted: October preliminary Source: U.S. Department of Commerce
Percentages are annual rates of change between months indicated.

had risen at an 11-percent rate from September 1965 to June 1966 and at a 7-percent rate from June to August, increased very slowly in the autumn. Achievement of essentially full employment, development of bottlenecks, and problems of substantial shifts from civilian to military production have necessitated some reduction in the rate of real growth. A softening of demand also may have developed. Steel was produced at a slightly slower pace in the July-October period than in the previous 4 months. Construction put in place, after reaching a peak during the first 4 months of the year, has since fallen significantly.

PRICES

The slowing in the pace of spending also may have been reflected in price developments, though inflationary pressures remain. Since August wholesale prices have declined, after rising at about a 4-percent rate earlier in the year. The industrial price component has risen only slightly since July, after rising at a 3.4-percent rate during the previous seven months. Prices of farm products and processed foods fell from August to November but remained about 3 percent higher than a year earlier. Consumer prices have continued to rise at the disturbing 4-percent pace which has prevailed since the fall of 1965.

OTHER DEVELOPMENTS

The amounts of credit demanded and possibly the fundamental demands have lessened since early fall. Extensions of loans and net purchases of securities by financial intermediaries have slowed. In part this has reflected the lack of success of deposit-type institutions in attracting savings and the inability of banks to expand credit, caused by the decline in reserves. Since early fall there are indications that direct financing also has been less.

Some interest rates, after rising to peak levels in early September, declined moderately during the fall despite a lack of monetary expansion in the period. Yields on highest grade corporate bonds declined from 5.49 percent in September to 5.37 percent in early December. Three-month Treasury bill rates decreased from 5.36 to 5.10 percent during the same period.

CAUSAL FACTORS

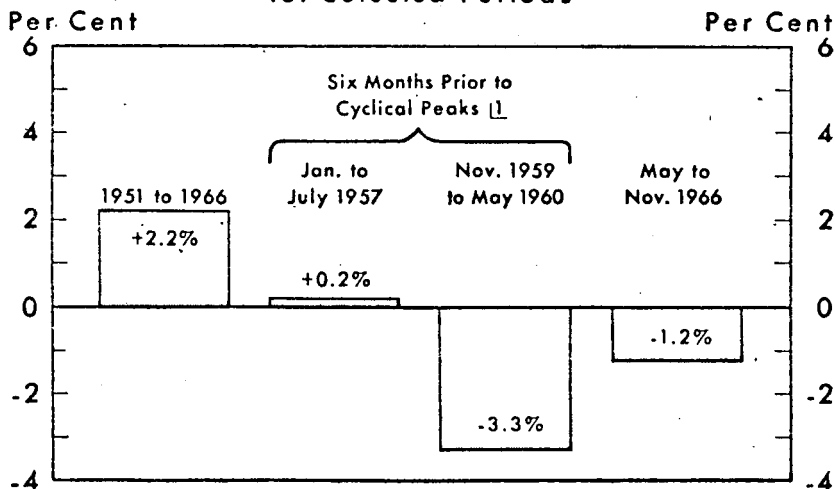
The pronounced shift in monetary trends beginning last spring may have exercised some restraint on the excessive demands for goods and services. Both bank reserves and money, which had been rising before April at the fastest rate in over a decade, have since been contracting. Usually such a marked and sustained change in the course of bank reserves and money has been followed after a brief lag by a significant slowing in spending.

Federal fiscal influence, on the other hand, has evidently continued to be expansive in late 1966. Total Government outlays have been expanding significantly, and both the national income accounts measure of total fiscal impact and the high-employment measure of current Government actions have continued to indicate stimulation.

There were some evidences, however, supplementing the formal budget measures, that the Government may have been a little less stimulative in late 1966 than in the previous year. New orders for war materials were probably not rising so rapidly relative to deliveries as in the earlier period. Late in the year the 7-percent investment tax credit and accelerated depreciation benefits were withdrawn, making private investment somewhat less attractive. In November the Treasury replaced maturing securities with 5-year obligations, reducing somewhat the liquidity of the public. At the beginning of 1967 another increase in social security tax rates is scheduled.

The nature of our productive process may have contributed to a slowing of aggregate demands for goods late in the year. During 1965 and early 1966, as demands for goods of the producers of final products expanded, derived demands on the suppliers of these concerns rose even more sharply. The suppliers not only had to produce materials for the products which were ultimately sold but also to provide the final producers with inventories and other investment goods to expand. When many final producers reached capacity operations in 1966, they had to slow their rate of expansion even though final demand continued in excess of capacity. The slower growth in real output of final producers meant an actual reduction in both dollar and effective demands for materials from some suppliers.

Changes in Money Stock for Selected Periods



[1] As defined by National Bureau of Economic Research.
Per. ntages are annual rates.

OUTLOOK

At the beginning of 1966 economic stabilization required containing excessive demands for goods and services, thereby moderating inflationary pressures. In the early months of the year, the problem was aggravated by rising contracts and expenditures for the Vietnam conflict and a reluctance either to reduce social programs or to increase tax rates. Monetary actions also were stimulative, partly because the huge demands for funds caused rapid expansion of commercial bank demand deposits even at rising levels of interest rates.

In the fourth quarter of the year the major task may have shifted from one directed primarily to restraining exuberance to one of maintaining an optimum growth in total demand. By late 1966 total demand had lost some of its strength, and concern was being expressed over whether adequate expansion of total demand and of real product would be continued in 1967.

The problem of achieving appropriate total demand in 1967 is complicated by cost-push inflationary pressures which are strong at the end of 1966 and which could be easily reinforced by excessively expansive fiscal and monetary actions. Even if total demand is one which in the long run might be considered optimal, many prices are likely to increase seriously in 1967 because of the excessive total demand and price increases for the past year. Prices do not always rise immediately in response to demand-pull forces; some have been held back because of guideposts, and others have been restrained because of contracts (including wage contracts). Many wage rates and other prices are expected to be marked up in 1967 because of the excesses of 1966 (these increases will place cost-push pressures on other prices, and it is unlikely that there will be enough offsetting price declines to prevent undesirable general price increases).

At year-end it appears that the combination of monetary and fiscal developments may not have to be so restrictive in the coming year as it has been since the spring of 1966. Total demands for goods and services have probably slowed, and a further reduction might cause an unwarranted contraction of employment and real product.

The mix of policy actions must also be selected. If lower interest rates are judged desirable in order to stimulate areas such as housing and other private investment and to foster real growth in the private economy, emphasis might be placed on a combination of restrictive fiscal policies with expansive monetary actions. If large declines in interest rates are believed undesirable because of a likelihood of increased outflows of funds from the country, reliance might be placed on a policy mix with relatively stimulative fiscal actions and quite limited monetary expansion.

STRAINS AND RESTRAINT IN A SURGING ECONOMY*

The major theme of recent economic developments is the continuation of progress. But there is also a secondary theme of problems and imbalances, many of which can be traced back to mid-1965, when the sudden increase in defense requirements for Vietnam led to a marketed acceleration in economic activity. By the time measures of fiscal and monetary restraint took hold and slowed down the economy, significant problems had developed—an interruption of price stability, a deterioration in international trade performance, acute pressures in financial markets, and sharply divergent movements among the various sectors of the economy.

THE ECONOMY IN MID-1965

As of mid-1965, the economy was advancing steadily and healthily toward full employment. GNP had risen by \$11 billion a quarter, on the average, for the preceding 2 years; the annual rate of real growth over that period had been 5½ percent. Unemployment was down to 4½ percent of the civilian labor force, and the average operating rate of manufacturing capacity was up to 89 percent. The price record showed few blemishes: average consumer prices in July 1965 were only 6 percent higher than they had been in early 1961, and prices of nonfood commodities had risen by only 3 percent. Prices of manufactured finished products at wholesale had advanced by 1 percent in 5 years.

Expansionary fiscal policy had contributed actively to the record of 52 months of advance. The reform of depreciation rules and the investment tax credit, both initiated in 1962, encouraged business to expand and modernize plant and equipment. Furthermore, as a result of these measures and the much larger tax reductions granted by the Revenue Act of 1964, both corporate and individual income recipients were enjoying an average reduction of one-fifth in their tax liabilities. Monetary policy continued to meet the credit needs of a brisk expansion and thereby contributed to the relative stability of long-term interest rates that was unusual for a period of rapid economic advance. Meanwhile, Federal spending on goods and services was essentially level after mid-1962. As a share of the growing GNP, defense purchases fell steadily from 9.2 percent in 1962 to a post-Korean low of 7.3 percent by mid-1965. Defense spending was clearly not the fuel that was propelling the economy toward full employment. But neither was the decline in the defense share permitted to retard the growth of total demand; some economic stimulus was provided by spending on new Federal civilian programs, and major reductions in taxes encouraged private spending.

New stimulative policies were being prepared in the spring of 1965 to complete the advance to full employment. Congress enacted a major phased reduction of excise taxes, in line with the President's proposals,

*Excerpted from Annual Report of the Council of Economic Advisers, January 1967, pp. 45-52.

and its first stage took effect in June 1965, cutting taxes by \$1¼ billion (annual rate). A liberalization of social insurance benefits, designed to help the aged, was enacted to take effect retroactively. The larger benefits were to be financed by a payroll tax increase at the beginning of 1966. Meanwhile the liberalization of benefits was expected to give the economy a significant stimulus in the fall of 1965 when an anticipated liquidation of steel inventories might otherwise have threatened a slowdown. The retroactive portion, which was disbursed in September, amounted to \$900 million. Thereafter annual benefits were raised by about \$2 billion.

SPURT IN ECONOMIC ACTIVITY

The economic environment was significantly changed by the expansion of defense requirements. On July 28, 1965, the President requested additional funds for defense and indicated that further increases would be required in January. Military outlays, at an annual rate, rose by nearly \$2 billion a quarter in late 1965 and early 1966 (table 3). Defense orders expanded very rapidly, spurring demands for labor and inventories by contractors.

Yet the defense buildup itself was not enough to account directly for the acceleration in the overall economic advance. Rather, it reinforced the previously planned fiscal stimuli and the forward momentum of a strong economy close to full employment. Furthermore, the expansion of defense spending contributed to a significant change in the climate of opinion. The Vietnam buildup virtually assured American businessmen that no economic reverse would occur in the near future. The impact on business attitudes was intensified by unwarranted fears that the Vietnam conflict might have consequences like those of the Korean conflict: direct controls, excess profits taxes, and a huge jump in prices of raw materials.

TABLE 3.—Changes in gross national product during 2 periods since mid-1965

[Billions of dollars, seasonally adjusted annual rates]

Expenditure category	Change	
	1965 II to 1966 I	1966 I to 1966 IV ¹
Gross national product.....	48.3	37.9
Personal consumption expenditures.....	28.8	18.8
Durable goods.....	5.9	-2
Nondurable goods.....	12.5	6.8
Services.....	10.4	12.2
Gross private domestic investment.....	10.8	3.5
Fixed investment.....	9.6	-2.0
Business fixed investment ²	9.1	4.7
Residential structures.....	.5	-6.7
Change in business inventories.....	1.3	5.5
Net exports of goods and services.....	-2.2	-1.2
Government purchases of goods and services.....	10.7	16.9
Federal.....	6.3	10.6
National defense.....	5.5	10.9
Other.....	.9	-4
State and local.....	4.4	6.3

¹ Preliminary.

² Nonresidential structures and producers' durable equipment.

NOTE.—Detail will not necessarily add to total because of rounding.

Sources: Department of Commerce and Council of Economic Advisers.

The increase in defense spending swelled an already strongly rising tide of business investment expenditures. From the second quarter of 1965 to the first quarter of 1966, business spending for new structures and equipment rose by \$9 billion. Defense, investment, and social security liberalization, in combination, speeded the growth of disposable income. Consumer spending responded strongly, growing by \$29 billion over this three-quarter interval. All in all, GNP advanced at an average of \$16 billion a quarter. Real output grew at a phenomenal annual rate of 7.2 percent, and industrial production rose at an annual rate of 9.7 percent.

Unemployment fell from 4.7 to 3.8 percent of the civilian labor force during this period. New orders for durable manufactured goods rose markedly by (12 percent), with orders for electrical machinery (20 percent) and defense products (19 percent) increasing especially rapidly.

The surge in demand for goods and labor created pressures on prices in many areas. From October 1965 to July 1966, the annual rate of advance for industrial wholesale prices stepped-up to 3 percent. Prices of industrial crude materials moved sharply upward—at an annual rate of 8 percent from October to April. At the consumer level, demand pressures raised prices of services and nonfood commodities and combined with special supply factors in agriculture to push up food prices. These price movements and their consequences are discussed in detail in chapter 2. All in all, the economy exceeded reasonable speed limits in the period from mid-1965 through the first quarter of 1966.

MODERATION IN THE PACE OF ADVANCE

After years of providing stimulus to the economy, policy changed direction at the turn of the year. Monetary policy accounted for a major share of the restraint during most of 1966. As described in detail below, the Federal Reserve restrained the growth of credit supply in the face of extremely strong demands for borrowing by business. With intense competition for funds, interest rates rose sharply. Institutions which supply mortgage funds to the home-building industry lost deposits both to the commercial banks and to the market for new corporate securities. As a result, residential construction was starved for funds, and the sharp decline in this sector was one of the principal moderating influences during the second half of 1966.

Fiscal policy also responded effectively. Although the special defense costs necessarily swelled Federal outlays and were highly stimulative, restrictive actions were taken in other areas. Increases in nondefense purchases were held to \$300 million from 1965 to 1966. Several restrictive tax measures were proposed in January 1966, and were enacted in mid-March. These included a reinstatement of some of the earlier excise tax reduction, restoring about \$1 billion to the annual rate of Federal revenues; and a system of graduated withholding for individual income taxes that drew off \$1½ billion (annual rate) from disposable income beginning in May. These new measures followed the \$6 billion increase in payroll taxes that took effect at the start of 1966. In addition, revenues were increased in the spring by unusually large payments on 1965 income tax liabilities.

The national income accounts budget for the Federal sector shifted from a deficit at an annual rate of \$1½ billion in the second half of 1965 to a surplus at an annual rate of \$3 billion in the first half of 1966. (As explained in the appendix to this chapter, Federal fiscal policy is discussed throughout this Report in terms of the national income accounts budget.)

These monetary and fiscal actions helped to bring the rate of overall economic expansion in line with the growth of capacity. After the first quarter of 1966, gains in GNP slowed to an average of \$12½ billion a quarter, no longer outstripping the growth of potential GNP. The unemployment rate leveled off, as employment gains essentially matched the growth of the labor force. Manufacturing output actually rose less than the growth of manufacturing capacity, and average operating rates at year-end were below the 91 percent that had been reached in the first quarter.

The change of pace was first clearly noticeable in the spring. Fiscal restraint appreciably slowed the growth of disposable income in the second quarter and contributed to a marked slowdown in consumer spending. During the summer, consumer demand perked up again. But homebuilding, which had declined moderately in the second quarter, was hit hard by the shortage of mortgage financing and took a sharp plunge, holding down the increase in economic activity.

Business demand for capital goods, on the other hand, continued to expand rapidly during the spring and summer. Although tight money, rising costs of machinery and construction, declining prices of common stock, and appeals for voluntary restraint had moderating effects in particular firms and industries, total business investment forged ahead. In August, both the Commerce-SEC anticipations survey and the National Industrial Conference Board appropriations survey confirmed the vigor of the capital boom. Commercial construction was the only type of business investment that showed weakness; it was restrained by the shortage of mortgage funds.

The capital boom, in fact, was proving too vigorous. In view of the growing backlogs of orders, shortages of certain types of skilled labor, rising prices in capital goods industries, and acute pressures of business credit demands on financial markets, there was a clear need to moderate investment demand. On September 8, the President asked Congress to suspend, until January 1, 1968, the 7-percent tax credit on investment in machinery and equipment and accelerated depreciation provisions on new buildings. At the same time, he initiated a program to reduce nondefense spending.

The Commerce-SEC survey in November showed that only moderate further increases in plant and equipment spending were planned through the second quarter of 1967. It also revealed that the actual increase in capital outlays in the third quarter was somewhat smaller than the planned advance reported in August; this was the first downward revision of plans in 3 years. The results of the survey no doubt reflected several factors, including the moderation of economic expansion, the financial pressures on business, and the suspension of the investment tax incentives. Even though orders for machinery and equipment continued to outrun shipments through December, there were favorable prospects that the pressures of excess demand on capital goods industries would be lessened in the months ahead.

RETROSPECT

Despite the moderation after the first quarter, expansion for 1966 was more rapid than virtually anyone expected at the outset. At the time it was presented last January, the Council's forecast that GNP in 1966 would rise strongly by \$46½ billion was somewhat above the typical forecast of private economists. Yet it turned out to be \$12 billion too low. In part, the underestimate reflected the difference between the predicted real growth of nearly 5 percent and the actual rate of 5½ percent. In addition, the overall price deflator rose by 3 percent—about 1 percentage point more than projected.

The primary sources of the underestimate were in Federal defense purchases and business fixed investment. While both had been expected to be key sources of strength they were even stronger than anticipated. As the prospective duration of Vietnam hostilities and the intensity of our military commitment exceeded those assumed in the budget, Federal spending for defense in the calendar year ran above last January's estimate by \$4 billion. Spurred in part by defense outlays, expenditures on plant and equipment topped the Council's expectations by \$2 billion to \$3 billion. State and local purchases and inventory investment also were above the projections, while homebuilding and net exports fell below the estimates.

As it became clear that public and private demand was exceeding expectations, the desirability of further increases in taxes came under public discussion. Continuing and careful consideration of this issue within the administration, sharpened by the increasing strain on financial markets, led to the fiscal program of September 8. In retrospect it is clear that, after March, monetary and fiscal policy in combination provided adequate total restraint. It may be debated whether a better balance of demands and policies would have been achieved if a program of additional fiscal restraint had been undertaken earlier in order to relieve the pressure on monetary policy. It may also be argued that the capital boom could have been cooled off sooner if the investment tax credit had been suspended earlier in the year. The question of whether a different timing or different magnitude of fiscal actions might have produced a more favorable balance in 1966 will long interest and challenge analysts of economic policy. But the main lesson is clear from the record: economic policy was used effectively to restrain the economy during 1966, much as it had been used during the preceding 5 years to stimulate demand.

THE PATTERN OF OUTPUT

In contrast to the reassuring balance of the expansion from 1961 to 1965, the advance in 1966 was uncomfortably uneven among sectors. The nature of these imbalances is illustrated by chart 2, which shows the shares of GNP absorbed by various types of expenditures since 1954.

It is striking that the portion of GNP devoted to Federal purchases in 1966 was much the same as in earlier years. Indeed, despite the sharp growth of defense outlays, Federal expenditures represented a smaller share of national product than in any other post-Korean year

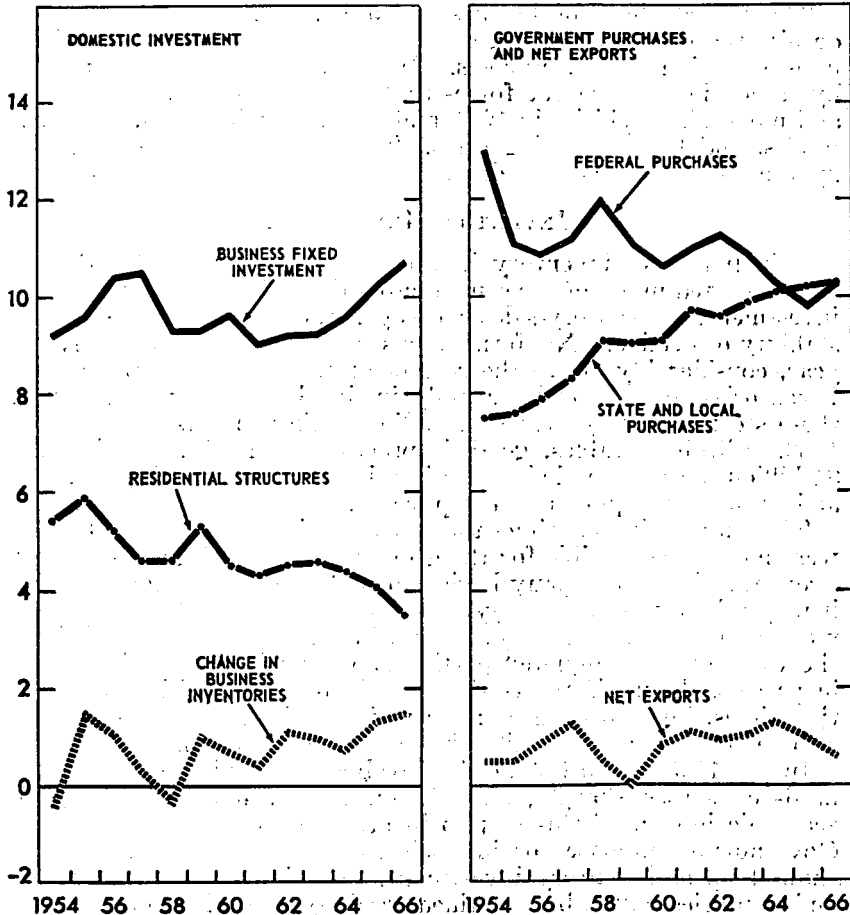
except 1964 and 1965. The share of defense purchases was 8.1 per cent, also lower than in any year from 1954 to 1963. State and local government purchases continued their secular rise as a share of GNP.

The share of private domestic and foreign investment in 1966, 16 percent of GNP, was quite typical for a full-employment year. Private investment exceeded private saving at full employment, leaving room for moderate surpluses in government budgets (national income accounts basis).

Chart 2

Selected Shares of Gross National Product

PERCENT OF GNP



SOURCE: DEPARTMENT OF COMMERCE.

UNEVEN SHARES IN INVESTMENT

Although the share of investment in GNP was normal, the pattern of the major investment components was unusual when compared with other post-Korean years. Business fixed investment was at a record high of 10.7 percent of GNP, surpassing its previous peak of 10.5 percent in 1957 and considerably above its post-Korean average of 9.8 percent. Because of the scarcity of mortgage funds, housing starts fell steadily from an average of 1.5 million units in the first quarter of the year to 1 million in the fourth; at 3.5 percent, the share of residential construction was at a post-Korean low. Inventory investment, at 1.5 percent, matched its previous post-Korean high of 1955. Excess demand at home generated a spurt in demand for goods from abroad, pulling down the share of net exports to the lowest level since 1959.

The record share of business fixed investment in 1966 occurred despite the need for a much greater volume of external financing at unusually high borrowing costs. Incentives to invest were provided by a continuation of the forces that had spurred business to expand and modernize facilities in 1964 and 1965: growing sales, orders, and profits, and high operating rates. These were further strengthened by the rise in defense spending.

INVENTORY INVESTMENT

A high rate of inventory investment in relation to GNP during 1966 reflected many of the same factors that stimulated business fixed investment. Inventory-sales ratios generally crept up after years of stability or decline. Nonfarm stocks expanded by 8 percent over the year, considerably above the rate of growth of real output or sales. Inventories rose especially rapidly in durable goods manufacturing; these stocks grew by nearly \$7 billion during the first 11 months of 1966. Within durables, goods-in-process inventories rose by about \$4 billion over the period, reflecting, in part, the buildup of defense and business equipment in the pipeline.

The long production times that are essential for many durable goods were largely responsible for the growth of stocks of goods-in-process. From the time a company begins to build an airplane or a machine, it may take 6 months or a year to produce a finished good and complete a shipment. While the piece of equipment is being fabricated, the value of the completed portion shows up in inventories of goods in process. Thus, if orders rise sharply for items with long production times, inventories grow; the ration of inventories to shipments also tends to increase until shipments can catch up.

In late 1965 and in 1966, orders for business equipment and defense hard-goods rose sharply, and shipments did not keep pace. The economic impact of this stepup in orders was not fully reflected in Government purchases or in business fixed investment; some of it showed up as inventory investment. The impact of defense orders on inventories cannot be quantified precisely. But it can be estimated by two approaches: one uses data on progress payments made by the Department of Defense, and the other rests mainly on the statistics of defense-oriented industries. Both approaches suggest that, from the beginning of the fourth quarter of 1965 through the third quarter of 1966, defense contractors and their suppliers added about \$2 billion to their stocks as a result of defense orders.

THE FEDERAL BUDGET AND ECONOMIC STABILIZATION

The President's Council of Economic Advisers forecasts 1967 gross national product at \$787 billion in current prices, an increase of about 6.5 percent over 1966. This increase consists of an advance of nearly 4 percent in real output and an increase of slightly more than 2.5 percent in prices.¹

The Council's forecast, or plan, is constructed in large measure on a Federal budget program that produces in calendar 1967 about a \$4 billion deficit on a national income accounts basis.² A 14.3-percent increase in Federal spending and an 11.3-percent rise in revenues underlie this projected deficit. The expected increase in revenues will result from several factors, including continued advance in total income and a proposed 6-percent surcharge on personal and corporate income taxes effective July 1.

The Federal budget program and the Annual Report of the Council of Economic Advisers (CEA) together can be viewed as a national economic plan in the spirit of the Employment Act of 1946. The presentation of the CEA is based, in considerable measure, on the popular theory that Federal budget policy to a major degree can control total demand and thereby exert a primary influence on changes in real output and prices. Budget policy is presumably designed to achieve an optimum level of demand compatible with the goals of high employment, real growth, relative price stability, and equilibrium in the nation's balance of payments.

In contrast with the fiscal policy theory of economic stabilization there is an alternative school of thought which places primary emphasis on control of monetary variables as a vehicle for influencing total spending. It is the belief of this school that monetary factors play a dominant role in the determination of total demand.³

The theory implicit in the following presentation is that the combination of stabilization policies, rather than fiscal or monetary policy alone, in large part determines total demand. Consequently, this discussion of the Federal budget alludes frequently to the role of monetary policy in national economic developments. The purpose of this article is to summarize the proposed Federal budget program for calendar 1967 and to examine its implications as a part of total stabilization policy.

Although the Federal budget receives considerable attention at this particular time of year, it seems that in the interest of a dynamic and effective stabilization policy, or even of a neutral policy, the budget program should be reviewed continuously throughout the year. Evaluations are made privately on a continuous basis, but an official

¹ *Annual Report of the Council of Economic Advisers* (January 1967), pp. 62-63.

² The national income accounts budget summarizes the receipts and expenditures of the Federal Government sector as an integrated part of the recorded activities of all sectors of the economy. For expanded discussion of this and other fiscal measures, see the appendix, "Budget Concepts and Definitions," p. 597.

³ The 1967 report pays considerable homage to the role that monetary policy played in restraining total demand in 1966. The appearance of such an acknowledgment distinguishes the 1967 report from previous ones, in which monetary policy was seemingly considered supportive (for fiscal policy) rather than active in affecting total demand.

midyear budget review (with revised projections) was not released to the public in 1966. To assure a free and fully informed discussion and interchange of ideas both inside and outside of Government, it would be desirable to have official revised projections frequently, possibly on a quarterly basis.⁴ A midyear review in July or August after Congress has made most of its decisions would seem more reliable for the ensuing year than the 12-month forecast made in January. The CEA report focuses primarily on the immediate 12 months, while the budget concentrates on the 12-month period beginning next July.⁵

To form a basis for a discussion of budget policy in future months, this article summarizes and evaluates economic developments, budget conditions, and monetary developments in calendar 1966. The budget program through June 1968 is then summarized and analyzed within a framework emphasizing total stabilization policy. An appendix is provided that discusses alternative budget measures.

BUDGET POLICY AND ECONOMIC AND MONETARY CONDITIONS IN 1966

Real economic activity advanced rapidly in 1966, but advances were constrained by the size of the labor force and limitations on plant capacity. Employment, production, and income all increased, though less rapidly than in 1965 when some economic slack remained.⁶ As a result of total demand pressing on available resources, prices rose significantly, particularly early in the year. In an attempt to limit excessive total demand and price increases, monetary expansion was restricted beginning in the spring. Intense demands for credit produced rising interest rates early in the year, while limitations on credit expansion accelerated the rise during the summer.

The Federal budget, on balance, was a strong force underlying the buoyant economic situation in 1966. Government expenditures grew rapidly as spending for defense and health, education, and welfare programs rose sharply. Federal revenues also increased rapidly, partly in response to rising money incomes but also in some measure because of increases in tax rates.

RESOURCE TRANSFERS IN 1966

Total income and output showed advances substantial enough to keep the economy at high employment during 1966. Real output (GNP in constant dollars) rose 4.1 percent in the year ended in the fourth quarter of 1966, with the advance most rapid in the first quarter.

The year 1966 was marked by the necessity to allocate resources to military use more rapidly than total available resources were growing. Such a transfer of resources is facilitated if there is a considerable quantity of unused resources in the economy, as was the case at the outbreak of the Korean conflict. The Vietnam war was escalated at a time when there was very little slack in the economy.

⁴ A similar recommendation has recently been made by the Joint Economic Committee of Congress. Although revised budget projections are not made available, data on realized expenditures and revenue, are readily available. See, e.g., the *Survey of Current Business*. For a brief quarterly analysis of these data see "Federal Budget Trends," a release of the Federal Reserve Bank of St. Louis.

⁵ Since there is some evidence to support the view that the budget affects economic activity with some lag, see, e.g., Albert Ando and E. Cary Brown, "Lags in Fiscal Policy," *Stabilization Policies*, research studies prepared for the Commission on Money and Credit (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), it would seem that the budget for fiscal 1968 (year ending June 30, 1968) must afford a basis for an economic plan for a year beginning in, say, October 1967 or January 1968. If the primary concern of the Economic Report is the state of the economy in calendar 1967, it would seem that the budget for the year ending June 30, 1967, is more relevant than the budget for the year ending June 30, 1968.

⁶ For an extended discussion of economic developments in 1966, see the December 1966 issue of this *Review*.

At times of high employment and near-capacity levels of output, a resource transfer from civilian use to military use is normally effected by either tax increases or a system of Government controls. Neither route was followed with respect to the Vietnam build-up in late 1965 and 1966. Instead, the price mechanism was utilized to effect the resource transfer, i.e., the Federal Government bid away goods and services from civilian use for the war effort.

Selected expenditures as a percent of GNP

Quarter	National defense	Consumer durable goods	Residential structures
1964:			
1.	8.1	9.3	4.6
2.	8.2	9.5	4.4
3.	7.8	9.6	4.3
4.	7.5	9.1	4.1
1965:			
1.	7.3	9.9	4.2
2.	7.3	9.6	4.2
3.	7.4	9.7	4.0
4.	7.5	9.7	3.9
1966:			
1.	7.6	9.7	4.0
2.	7.8	9.2	3.8
3.	8.3	9.4	3.3
4.	8.6	9.2	2.9

Source: U.S. Department of Commerce.

Overall price increases thus operated as a silent tax in the absence of more restrictive fiscal or monetary actions. The growth of real after-tax personal income slowed as prices rose faster relative to money incomes than previously. Associated with the slowdown in the growth of real spendable income was a decline in real demand for civilian goods, in particular for automobiles and housing.

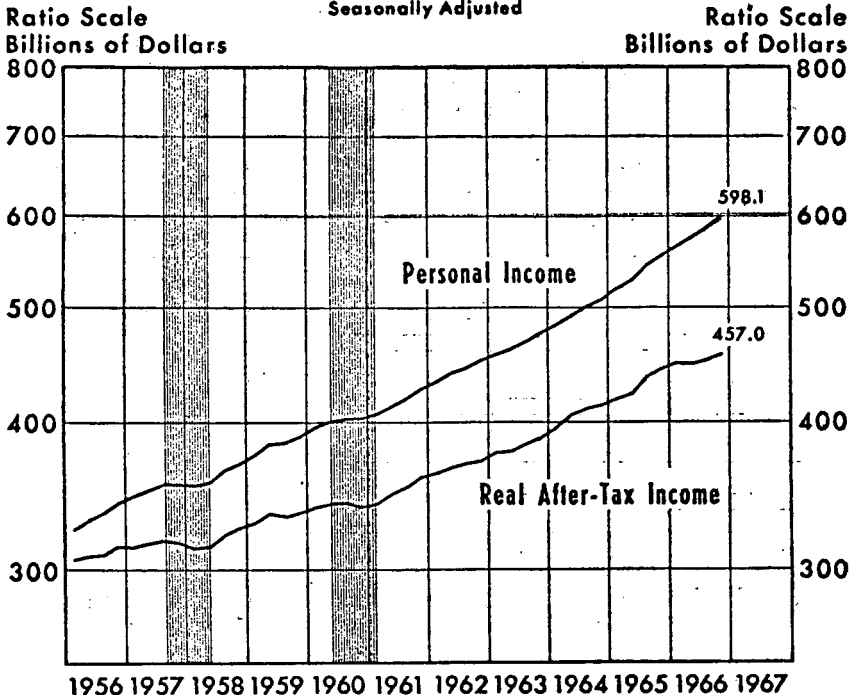
In response to excessive dollar demand for goods and services, and thereby for loan funds, and to some extent to restriction on monetary expansion beginning in the spring of 1966, interest rates rose. This increase in the price of credit helped to effect the transfer of resources by discouraging demand for those goods where capital and interest are important elements of total cost, e.g., housing and commercial and industrial buildings.

The resultant rise in interest rates affected housing more than if the resource transfer had been effected by taxes. Housing probably would have been affected if incomes had been reduced by tax increases, but the extent would probably have been less. Interest rates would not have risen so rapidly, and the cost of new housing services would not have increased as much if a more restrictive course of fiscal action had been followed.

Any transfer of resources in a high-employment economy involves a cost, and some groups gain at the expense of others. However, transfer by tax increases permits the effects to be planned and regulated while maintaining the advantages of free markets. The price inflation mechanism causes inequities that are often unpredictable

Personal Income

Quarterly Totals at Annual Rates
Seasonally Adjusted



1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967

Note: Real after-tax income is personal income adjusted for tax changes and by the implicit price deflator for personal consumption expenditures.

Source: U.S. Department of Commerce
Shaded areas represent periods of business recession as defined by the National Bureau of Economic Research.

Latest data plotted: 4th quarter preliminary

and creates distortions that may be in conflict with national goals of efficient resource allocation and equilibrium in the balance of payments.

STABILIZATION POLICY IN 1966

The fiscal actions that were supposed to restrain demand in 1966—social security tax increases, speedup in the collection of individual and corporate income taxes, and rescission of scheduled excise tax cuts—came too late to thwart the inflationary pressures of the first quarter.⁷ In fact, there is some question whether the 1966 first quarter experience could have been avoided (or offset) by budget actions as late as January and February of that year. Because of lags in the effect of stabilization policies, the stage may have been set for an inflationary period by a very stimulative fiscal situation in late 1965 supplemented by rapid monetary expansion in late 1965 and early 1966. The Vietnam buildup in the last half of 1965 was accompanied by excise tax reductions and a large retroactive increase in

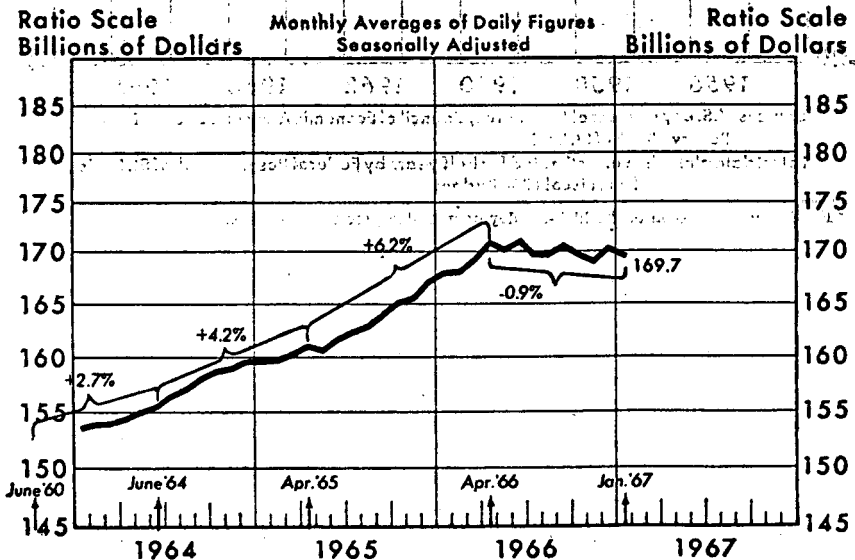
⁷ Normally a change in collection procedures is not viewed a restrictive action because individuals and firms supposedly react to changes in liabilities rather than collections. The speedup is mentioned here, however, because the 1966 CEA Report listed this action as restrictive in its effect on total demand. See pp. 53-54.

social security benefits. The money stock expanded at a 6-percent annual rate from April 1965 to April 1966. Other key monetary variables, such as commercial bank credit and member bank reserves, also increased very rapidly during the year ending in April 1966. This combination of monetary and fiscal forces may have been sufficient to cause the first quarter 1966 excesses and the carryover with respect to prices in the second quarter (even though the advance of GNP slowed substantially in that quarter).

The restrictive budget measures that were effected—increased social security taxes, accelerated tax collections, and rescinded excise taxes—may have helped to slow the economy after the unsustainable advance in the last half of 1965 and the first quarter of 1966. These fiscal actions represented restraining factors in addition to the April turnaround in monetary growth and the implicit tax increase through inflation. Although Government expenditures rose substantially in the first half of 1966, these increases were more than offset by the increase in tax revenues, and the national income accounts (NIA) budget showed a surplus of \$3.1 billion compared with a \$1.4 billion deficit in the last half of 1965.

During the second half of 1966 Federal expenditure increases outpaced the growth in receipts, resulting in a \$2.7 billion deficit in the NIA budget. Expenditures for the Vietnam war continued to rise, and some domestic nondefense expenditures also rose, particularly those related to the medicare program. No direct tax increases became effective in the second half, although in October the investment tax credit was rescinded and depreciation allowances for tax purposes were tightened. These measures probably had little effect on tax revenues in 1966, although they may have affected total demand via investment decisions.

Money Stock



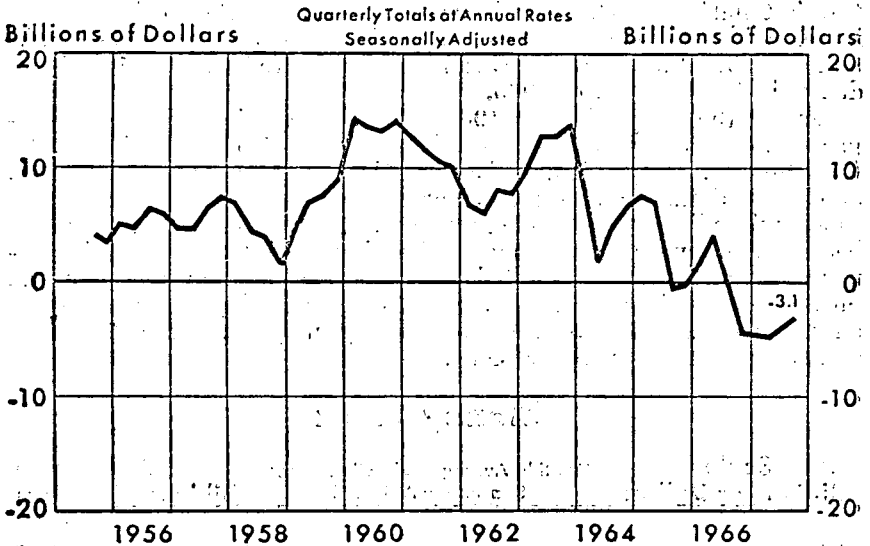
Percentages are annual rates of change between months indicated.
 Latest data plotted: January preliminary

For the year 1966 the NIA budget ran a small \$0.2 billion surplus, and since the economy was at full employment the high-employment budget showed the same result.⁸ On this high-employment basis, this small budget surplus in 1966 indicated the most stimulative budget in more than a decade. The high-employment budget ran about an \$8 billion average surplus from 1961 to 1965.

The stimulative budget situation in 1966 was accompanied by very restrictive monetary actions after April. The money stock showed little change from then to late fall. With loan demand fueled by rapid growth in total demand for goods and services, interest rates rose rapidly until September.

High-Employment Budget

(+) Surplus; (-) Deficit



Sources: U.S. Department of Commerce, Council of Economic Advisers, and the Federal Reserve Bank of St. Louis

Latest data plotted: 1967 estimated for half years by Federal Reserve Bank of St. Louis from Fiscal 1968 Budget

⁸ For further discussion of the high-employment budget, see the appendix.

BUDGET PROGRAM FOR FISCAL 1967-68

The economic outlook for 1967 depends in large measure on the course of recent, present, and future monetary and fiscal developments. Such developments in turn are influenced by the unfolding of economic events. A forecast of economic conditions and policy must take into account this simultaneity. Presumably the Council's forecast is based on this simultaneous interaction. This section discusses in some detail the budget program for the 18-month period ending June 30, 1968, and examines budget policy in light of expected economic and monetary conditions.

THE BUDGET PROGRAM: A FACTUAL SUMMARY

Budget plans for the next 18 months indicate a larger average deficit than in calendar 1966. This conclusion obtains for the national income accounts budget, considered to be the most complete and reliable measure of the Federal Government's activities and their economic impact.

The following summary of the fiscal program for the remainder of fiscal 1967 and fiscal 1968 is presented as general background and centers on the NIA budget. Fiscal year figures are given because the budget document is presented on that basis.

New obligational authority. Obligational authority on a cash budget basis, i.e., authority provided by Congress to obligate the Federal Government to pay out money, increases to an estimated \$194.2 billion in fiscal 1968 from \$190.4 billion in fiscal 1967. This fiscal measure is considered by some to be a key variable in any analysis of the Federal budget.⁹ The reason for this is that expenditures must be preceded by granting of obligational authority by Congress.

The \$3.8 billion increase in obligational authority planned for fiscal 1968 compares with an increase of \$27.3 billion in the previous fiscal year. Last year's January budget plan (i.e., for fiscal 1967) called for a \$3.5 billion increase in new obligational authority. These plans went awry, partly because of supplemental appropriations requested in January 1967 for Vietnam, but also because of larger-than-expected appropriations for housing, community development, health, education, and welfare.

Expenditures. Federal NIA expenditures in fiscal 1968 are estimated to increase 10.2 percent over fiscal 1967, which in turn is expected to be 16.1 percent above fiscal 1966. Fiscal 1967 expenditures are estimated at \$153.6 billion, 7.6 percent above the figure projected a year ago for the fiscal 1967 period.

⁹ See the writings of Murray L. Weidenbaum, e.g., "The Timing of the Economic Impact of Government Spending," *National Tax Journal* (March 1969), pp. 79-85.

Changes in obligational authority, cash budget

	Fiscal 1966 to fiscal 1967		Fiscal 1967 to fiscal 1968	
	Billions of dollars	Percent	Billions of dollars	Percent
Defense.....	8.6	12.5	2.2	2.8
International and space.....	-1.1	-10.1	0.3	3.1
Domestic.....	19.8	23.7	1.3	1.3
Health, labor, and welfare.....	10.8	27.9	3.7	7.5
Education, housing and community development, national resources, commerce, and transportation.....	6.6	36.1	-3.0	-12.1
Interest on public debt.....	1.4	11.6	0.7	5.2
Other ¹	1.1	7.7	-0.2	-1.3
Total.....	27.3	16.7	3.8	2.0

¹ Agriculture, veterans' benefits and services, general government, civilian and military pay increases.
Source: The Budget of the United States Government for the Fiscal Year Ending June 30, 1968, p. 44.

Changes in Federal spending, national income accounts budget

	Fiscal 1966 to fiscal 1967		Fiscal 1967 to fiscal 1968	
	Billions of dollars	Percent	Billions of dollars	Percent
Defense.....	11.8	20.9	5.8	8.5
International and space.....			-0.2	-2.3
	9.5	14.2	10.0	13.1
Domestic:				
Health, labor, and welfare.....	6.2	18.8	7.2	18.4
Education, housing and community development, national resources, commerce, and transportation.....	2.0	16.7	0.9	6.4
Interest on public debt.....	0.9	9.2	0.2	1.9
Other ¹	0.4	3.3	1.8	14.3
Total.....	21.3	16.1	15.6	10.2

¹ Agriculture, veterans' benefits and services, general government, civilian and military pay increases.
Source: The Budget of the United States Government for the Fiscal Year Ending June 30, 1968, p. 43.

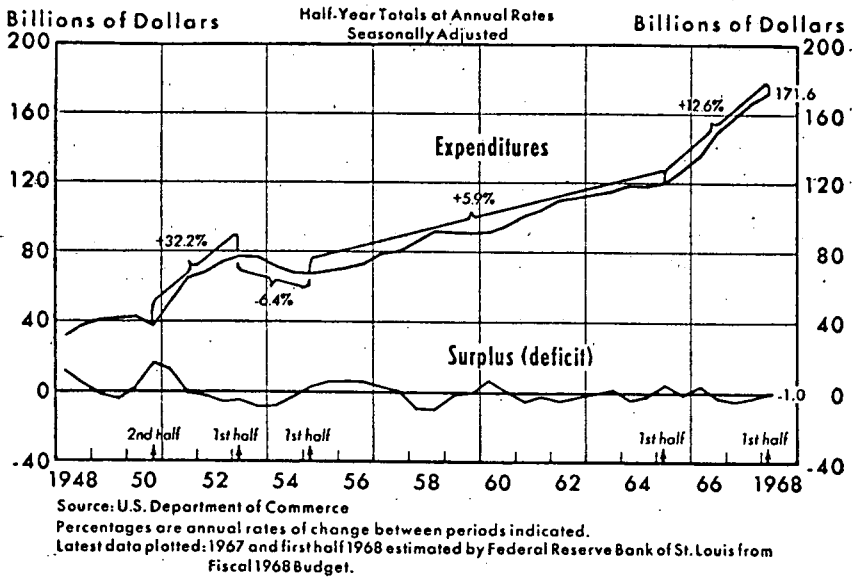
Changes in Federal receipts, National Income Accounts Budget

	Fiscal 1966 to fiscal 1967		Fiscal 1967 to fiscal 1968	
	Billions of dollars	Percent of 1966 receipts	Billions of dollars	Percent of 1967 receipts
Changes due to changes in tax law.....	7.0	5.3	5.8	3.9
Personal income.....	1.2	0.9	3.4	2.2
Corporate income.....			1.9	1.3
Excise and other.....			-5	-3
Social security.....	5.8	4.4	1.0	0.7
Changes due to growth in economy.....	10.2	7.7	11.5	7.7
Total.....	17.2	13.0	17.3	11.6

Source: Estimated by Federal Reserve Bank of St. Louis from The Budget of the United States Government for the Fiscal Year Ending June 30, 1968.

Fiscal 1968 expenditures include increases over presently estimated 1967 expenditures of \$5.8 billion or 8.5 percent for defense and \$9.8 billion or 11.5 percent for nondefense spending including expanded social security benefits. The increases in fiscal 1967 over fiscal 1966 are 20.9 percent for defense and 12.5 percent for nondefense programs.

National Income Accounts Budget



Receipts. Federal NIA receipts are expected to rise less rapidly than expenditures from fiscal 1967 to fiscal 1968, thereby increasing the deficit. Increases in receipts were large in fiscal 1966 and even larger in fiscal 1967. Such increases have resulted primarily because this was a period of rapidly expanding money incomes and inflation. Receipts were also accelerated however, by faster collections and increases in social security tax rates during this period.

NIA receipts are anticipated to increase by \$17.3 billion or 11.6 percent in fiscal 1968 over the previous fiscal year. Growth in receipts will result mainly from continued economic expansion but will also reflect the proposed 6-percent surcharge on personal and corporate income effective July 1, 1967, and a scheduled increase in social security tax rates on January 1, 1968.

BUDGET POLICY IN ITS ECONOMIC SETTING

Budget plans for calendar 1967 are predicated on a forecast of sluggish growth in private demand in the first half of the year with a resumption of more rapid growth in the second half. The purpose of this section is to examine Federal budget plans within the economic setting expected in calendar 1967.

An evaluation of the Federal budget plan at this particular time is replete with problems. The Council of Economic Advisers probably has access to more information than anyone else at the time of the budget's preparation. Consequently, this examination of the budget centers more on assumptions than on the internal consistency of the proposed total economic plan.

The economic plan, as presented in the fiscal 1968 budget and the CEA report, is to keep the economy on a full-employment growth path with relative price stability. The budget is presumably designed to provide just the right amount of fiscal stimulus or restraint at the appropriate time. The success of the proposed budget program de-

depends on the vagaries of private demand and the response of private demand to monetary and fiscal actions. Fundamental to success is whether budget policy is sufficiently flexible to move in accordance with changing economic and monetary conditions.

The budget program for the first half of calendar 1967 is essentially determined. Forces governing the course of expenditures and receipts are already in motion. The CEA indicates that the sizable stimulus of a \$5 billion NIA deficit will be appropriate in its timing and magnitude of impact on an economy characterized by weakening private demand.

Included in the budget program for the second half of 1967 is a proposed surtax which is supposed to provide restraint on strengthening private demand at that time. Such plans provide flexibility in that the surtax proposal could be dropped if economic conditions do not warrant fiscal restraint. Furthermore, if inflationary pressures intensify, the surtax rate could be increased above that which is proposed.

The 1966 experience suggests that budget policy was not sufficiently flexible to counter movements in private demand. During the first quarter of 1966, when it was quite obvious that further monetary or fiscal restraint was required, budget policy fell short as an instrument of stabilization. Fiscal restraint was not forthcoming because of the slow and cumbersome nature of the budget machinery. It was not possible to implement a tax increase because of the slowness of the Congressional process. Furthermore, most Government spending programs are of the type that cannot be slowed or speeded in accordance with the desire of the policymaker. Because of the relative inflexibility of fiscal policy, it was necessary for monetary policy to carry the burden of stabilization in 1966.

Taking these considerations into account, it appears that monetary policy may again be assigned a critical role in the total of stabilization policy in 1967. Monetary policy is flexible in its implementation, though there is a question about flexibility in its impact. Incomplete knowledge of the magnitude and timing of monetary actions on economic activity indicates that it should be used carefully as a tool of stabilization policy.¹⁰

Uncertainty about the length and variability of time lags in the implementation and effect of monetary and fiscal policy suggests that stimulus or restraint be applied in moderate doses when the economy is at high employment. Large adjustments in policy variables may cause instability, which is precisely what policymakers are trying to avoid.

The economic situation in early 1967 is believed to dictate a need for more stimulative economic policy. An indication that the fourth quarter 1966 increase in GNP contained some involuntary accumulation of inventory portends further slowing of production and attempts to reduce inventory. Since fiscal and monetary policies tend to affect total demand with lags, excessive stimulation in the next months might be too late to avert a slowdown in the first half of 1967 but might create serious inflationary problems in the second half. On the other hand, insufficient stimulation might cause the slowdown to continue well into the second half.

KEITH M. CARLSON.

¹⁰ Some evidence has recently been presented to support the view that monetary actions may affect total demand quite quickly via portfolio behavior of holders of liquid assets. See Donald P. Tucker, "Dynamic Income Adjustment to Money Supply Changes," *American Economic Review* (June 1966), pp. 433-449.

APPENDIX

BUDGET CONCEPTS AND DEFINITIONS

The fiscal activities of the Federal Government can be summarized in several ways. Some alternative budget concepts and the relationships between them are discussed in this appendix. A table reconciling these budget concepts is given, with data for fiscal 1966-68 used for illustration.

ADMINISTRATIVE BUDGET

The administrative budget is the basic planning document of the Federal Government, covering receipts and expenditures of funds that it owns. Its main purpose is to serve as a guide to executive and legislative program planning, review, and enactment. The administrative budget is in fact the only Federal "budget" in the sense of a financial plan. All other "budgets" discussed here are summary statements of receipts and expenditures classified in various ways for purposes other than administrative planning.

Those agencies for which Congress makes regular appropriations are included in the administrative budget. Public enterprises¹ are included while trust funds² and Government-sponsored agencies³ are not.

Expenditures and receipts are generally recorded on a cash basis, i.e., on the date of actual receipt or payment. Interest expense is on an accrual basis.

CASH BUDGET

The consolidated cash budget is a summary statement of cash flow between the Federal Government and other sectors of the economy. Included are activities of the regular Government agencies found in the administrative budget plus the activities of trust funds and Government-sponsored agencies. Because activities of some agencies (e.g., the post office) are recorded on a net basis, the full magnitude of cash flows between the Federal Government and other sectors of the economy is not measured by the cash budget.

The cash surplus or deficit serves as a measure of the direct impact of Federal Government spending and taxation on the financial assets of the private sector of the economy (including state and local governments). Surpluses or deficits in this budget indicate changes in the public debt and/or changes in the Treasury's cash balance.

NATIONAL INCOME ACCOUNTS BUDGET

The national income accounts budget summarizes the receipts and expenditures of the Federal Government sector as an integrated part of the recorded activities (i.e., the national income accounts) of all

¹ Commodity Credit Corporation, Federal National Mortgage Association, Export-Import Bank, etc.

² Federal old-age and survivors insurance, unemployment trust fund, highway trust fund, etc.

³ Federal home loan banks, Federal land banks, Federal intermediate credit banks, and banks for cooperatives.

sectors of the economy. Primary differences between the cash budget and the national income accounts budget are (1) on the expenditure side, spending is recorded when delivery is made to the Government, and purchases and sales of existing real and financial assets are excluded, and (2) on the receipts side, taxes are in large measure recorded when the tax liability is incurred.

HIGH-EMPLOYMENT BUDGET

The high-employment budget is an estimate of expenditures and revenues in the Federal sector of the national income accounts for a level of high employment.⁴ It is an attempt to correct the distortion introduced by the impact of the economy itself (through the effect of changing levels of economic activity on Government expenditures and tax receipts) on the realized surplus or deficit. The smaller the surplus or greater the deficit in this budget, the more stimulative is the impact of Federal fiscal activities and the less is the dependence on private demand to maintain high employment.

NEW OBLIGATIONAL AUTHORITY

Another measure of particular importance in evaluating the impact of the Federal Government on the economy is "new obligational authority." This is legislation by Congress permitting a Government agency or department to commit or obligate the Government to certain expenditures. Congress does not vote on expenditures; it determines new obligational authority. Before funds can be spent, an agency must submit and have approved by the Bureau of the Budget an apportionment request. This determines the rate at which obligational authority can be used. An agency usually incurs obligations, i.e., commits itself to pay out money, after apportionment by the Bureau of the Budget.

⁴The President's Council of Economic Advisers defines a high-employment level of economic activity as that level associated with a 4-percent unemployment rate. The high-employment budget could be computed for other budget concepts, but, for an analysis of the economic impact of the budget, the national income accounts basis seems most appropriate. For a description of techniques and procedures for calculating high-employment budget estimates, see Nancy H. Teeters, "Estimates of the Full-Employment Surplus, 1955-1964", *The Review of Economics and Statistics*, XLVII (August 1965), pp. 309-321.

Incurring obligations does not necessarily mean immediate cash expenditures. When the Government buys goods and services produced by the private sector, the lag of expenditures behind obligations may be substantial. In the case of items not usually kept in inventory, like military hardware, it usually takes time for private producers to draw plans, negotiate subcontracts, produce, and deliver the product.

Reconciliation of various measures of Federal receipts and expenditures

[Billions of dollars]

	Fiscal year		
	1966 actual	1967 estimate	1968 estimate
RECEIPTS			
Administrative budget receipts.....	104.7	117.0	126.9
Plus trust fund receipts.....	34.9	44.9	48.1
Less intragovernmental transactions.....	4.5	6.2	6.5
Receipts from exercise of monetary authority.....	.6	1.1	.5
Equals Federal receipts from the public.....	134.5	154.7	168.1
Less Cash transactions excluded from Federal receipts account (District of Columbia, financial transactions, etc.).....	1.3	1.8	2.0
Plus Items added to Federal sector account but not in cash receipts (netting differences, timing differences, etc.).....	- .6	-3.1	1.0
Equals Federal receipts, national income accounts.....	132.6	149.8	167.1
Plus adjustment for tax receipts because of deviation of econ- omy from high employment.....	.3	.2	0
Equals high-employment receipts.....	132.9	150.0	167.1
EXPENDITURES			
Administrative budget expenditures.....	107.0	126.7	135.0
Plus trust fund expenditures.....	34.9	40.9	44.5
Less intragovernmental transactions.....	4.5	6.2	6.5
Debt issuance in lieu of checks and other adjustments.....	- .4	.6	.7
Equals Federal payments to the public.....	137.8	160.9	172.4
Less cash transactions excluded from Federal expenditures account (District of Columbia, financial transactions, etc.).....	7.3	8.7	5.0
Plus Items added to Federal sector account but not in cash payments (netting differences, timing differences, etc.).....	1.8	1.5	1.8
Equals Federal expenditures, national income accounts.....	132.3	153.6	169.2
Plus adjustment for expenditures because of deviation of econ- omy from high employment.....	0	0	0
Equals high-employment expenditures.....	132.3	153.6	169.2
SURPLUS OR DEFICIT			
Administrative budget.....	-2.3	-9.7	-8.1
Cash budget.....	-3.3	-6.2	-4.3
National-income accounts budget.....	+ .3	-3.8	-2.1
High-employment budget.....	+ .6	-3.6	-2.1

Sources: The Budget of the United States Government for the Fiscal Year ending June 30, 1968 and Federal Reserve Bank of St. Louis.

Part III

MILITARY IMPACT ON THE GENERAL ECONOMY

This section consists of studies analyzing in detail the timing of the economic impact of government, and especially military spending. The leads and lags in government procurement impacts are particularly significant for the current period.

The paper, "Employment Impacts of Defense Expenditures and Obligations," is scheduled for publication in a forthcoming issue of the *Review of Economics and Statistics* and is made available through the courtesy of that journal.

THE ECONOMIC IMPACT OF THE GOVERNMENT SPENDING PROCESS*

BY

MURRAY L. WEIDENBAUM

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SUMMARY

An examination of the major phases of the Federal Government spending process reveals that the economic impact of government spending may occur during any of the phases of the process, but often prior to the actual governmental disbursements.

These phases are (1) granting of financial authorizations by the Congress; (2) placing of contracts with business firms; (3) production of goods and services; and (4) delivery of the items to the Government and payment therefore.

Under certain circumstances, the effects of the announcement of newly granted obligational authority may cause an increase in private spending in advance of the placement of contracts or of the expenditure of funds. More usually, economic activity will be affected soon after contracts or orders are let with private producers. The private contractor undertaking to fill the order will, at the time the order is placed (or perhaps even before, if intent to place the order has been expressed to him), begin to acquire the resources needed for its completion. It is, therefore, at the order stage that the governmental procurement action will have its initial and often major impact on the markets for labor, raw materials, and financial resources; a stage often several years before the procurement transaction is recorded as a government purchase or payment.

*Reprinted from *The Business Review*, The University of Houston, vol. 8, spring, 1960.

This study is based on a doctoral dissertation prepared at Princeton University. Portions have appeared in the following journals and the editors have kindly consented to the use of some of the material: *Accounting Review*, *American Journal of Economics and Sociology*, *Federal Accountant*, *National Tax Journal*, and *Public Finance*.

The writer wishes to express his deep appreciation to Profs. Paul J. Strayer and Lester V. Chandler of the Department of Economics of Princeton University for their advice and guidance in the course of the study. The writer is also indebted to his former colleagues at the U.S. Bureau of the Budget for encouragement and much necessary information.

This production on Government order will be recorded in the national income accounts as increases in gross private domestic investment (change in business inventories). This private production on Government account does not appear in any of the generally used measures of Government spending.

Only as production is completed and as finished items are delivered to the Government will the transaction appear as a Government purchase. The delivery will be treated simultaneously as a decrease in gross private domestic investment; no net effect will occur in the level of gross national product at this point. The contribution will have been made earlier, during the production period prior to the actual government expenditures. Indeed, the governmental expenditure may coincide in time with a reduction in governmental impact on total demand.

However, the mere granting of appropriations and the placement of contracts may have little effect on the level of production when resources are fully employed. Also, to the extent that government orders can be filled out of existing inventories, the effect on production may not occur until the depleted inventories are restocked. Despite these and other complications, the primary impact of government procurement on the level of economic activity usually occurs in advance of the actual government expenditure.

Government spending for other than the acquisition of goods and services may approximate more closely, or even lead, the economic impact. This ordinarily would be true for transfer and interest payments and grants to State and local governments where the contribution to economic output would be made as the funds are respent. This would also hold for lending programs, except where production is begun on the basis of the Government's commitment to lend at a later date. Purchases of existing assets merely add to the liquidity of the recipients, unless the proceeds are used to purchase or finance current output.

The generally used measures of Federal spending cover only the completion phase of the spending process, represented by disbursements or by deliveries. Measures of some of the other stages of the process can be obtained or prepared. Data on budget authorizations granted by the Congress can be secured annually from the budget document. Information on contracts led and other "obligations" incurred by Federal agencies is gathered for internal budgetary purposes. There are no current data of production on government account since reports on inventories do not reveal the amounts relating to government orders.

Measures of the early stages of the government spending process can be used for many purposes of economic analysis. They are lead series which quickly register changes in demand and indicate future trends in governmental disbursements. They can also be used to evaluate developments in the economy during periods when changes in government purchasing exercise an important role.

The possibility of economic effects occurring during the various phases of the government spending process necessitates taking measurements of the spending stream at earlier points than merely at the completion stage. What is needed is not a single measure of Federal spending but a tool kit of series, each of which is useful for certain purposes.

INTRODUCTION

The impact of government spending on the economy is generally measured at the point at which disbursements are made. However, depending on the nature of the program and the state of the economy, the economic impact may occur significantly earlier than the actual expenditures. This study analyzes the many important circumstances under which the economic impact occurs during the earlier stages of the government spending process. Because of the length of time involved in carrying out many government procurement programs, it is important to know if economic effects occur at the point where expenditures are made or if they occur also, or instead, at some other place in the process. Except for some limited treatment made with reference to other matters, this is a question which has not been dealt with in the literature.¹

The outlays of the Federal Government in recent years have constituted by far the greater part of total government spending in the United States. The Federal Government has also become a major consumer of the Nation's economic output. Moreover during this time, fluctuations in the level of government spending have often exercised a dominant influence on the course of aggregate economic activity.

The concern with the government spending process and its measurement specifically arises in connection with these fluctuations and their ramifications. For many purposes of public policy and of fiscal administration, it is essential to have accurate instruments to record present movements and to understand their relationship to future trends. An inappropriate indicator of government spending may show an upturn when, in reality, the basic force of government spending is operating in quite the reverse fashion. An insensitive indicator may show little movement when in fact a great fluctuation is taking place. A lagging indicator may only show movement with considerable delay.

As will be indicated, adequate information on the government spending process together with an understanding of its operation can be important in the formulation and administration of governmental economic policy and in the analysis of economic developments.

The increased extent to which Federal expenditures are being made to acquire privately produced goods and services has complicated the analysis even of the direct effects on the economy of governmental outlays. The public and the private sectors have become intertwined. No longer does the greater part of Federal expenditures go directly to consumers in the form of wages and of salaries of government employees, of interest payments to holders of Treasury securities; or of transfer payments to the recipients of social welfare benefits. The Federal Government is buying an increasing proportion of goods produced in the private sector, mainly in the form of armaments and of other security-related objects such as atomic energy installations and as strategic and critical materials. The payments to the factors of production for these goods are being made by the government contractors and not, as in the case of other government spending programs, by the Government itself. Such purchases of goods and services from

¹ Cf. Morris A. Copeland, "The Defense Effort and the National Income Response Pattern," *Journal of Political Economy*, June 1942, pp. 415-426; C. Lowell Harris, "Government Expenditure: Significant Issues of Definition," *Journal of Finance*, December 1954, pp. 351-364.

the private sector have risen from 31 percent of total Federal purchases in 1929 to 61 percent in 1959.

Economic literature abounds with references to government spending and its effects. Yet a full understanding of the governmental spending *process* often appears to be lacking. For example, Samuelson, in a knowledgeable article on fiscal policy, explains that the Congress does not legislate revenues, but tax rates. He then goes on to state that the Congress "legislates government expenditures."² As will be pointed out, Federal agencies and private business firms, rather than the Congress, exercise the controlling influence over the rate of government expenditures in a given period. The congressional action merely makes available funds which can be spent over an extended period.

Villard, in his important work on the contribution of government activity to income, decried as too lagging a definition of government expenditures which "would not count funds as 'spent' by the Government until the funds had been received as income by the factors of production involved in making the output bought by the Government."³ As will be demonstrated, these payments to factors usually *precede* rather than *follow* the actual government expenditures. Such a series would be a leading, rather than a lagging, indicator.

This study is rooted in an examination, theoretical as well as historical, of the entire Federal spending process and of the effects on the economy of the different phases of this process under varying circumstances. Such examination reveals the possibility of important economic impact during each of the phases of the process. It is also demonstrated that the timing and magnitude of the economic impact may vary according to the type of government outlay and the state of the private sectors of the economy.

A subsequent examination of the generally used measures of government spending reveals that they do not cover the economic impact of all of the major phases of the process, but only one—the completion stage represented by disbursements or deliveries. The study goes on to examine the potential availability of measures of other major phases of the government spending process and finds the most important and remediable shortcoming to be in the commitment stage. An attempt is made to construct a series on Federal commitments. The concluding section of the study is devoted to a discussion of the importance to economic analysis of the understanding of the operations of the government spending process generally and of the uses and limitations of this new series on spending specifically.

Because this study gives primary attention to developments and practices during the last two decades, military spending often dominates the discussion.⁴

Defense preparation and war periods have usually been the time when the Government exercises a strategic if not the dominant role in influencing the course of economic activity. It is at such times that there are large and abrupt changes in the rates of government spending. Moreover, armament programs particularly generate Govern-

² Paul A. Samuelson, "The Simple Mathematics of Income Determination" (In *Income, Employment and Public Policy*, essays in honor of Alvin H. Hansen, New York, W. W. Norton, 1948), p. 143.

³ "According to this definition, the Government would not have 'spent' all the money used to buy a battleship until part of the sum involved had been received by the iron miners who dug the ore from which was made the steel from which the battleship was built." Henry H. Villard, *Deficit Spending and the National Income*, New York, Farrar & Rinehart, 1941, p. 201.

⁴ " * * * spending for national security * * * except for brief interludes; has been the dominant type of Federal spending throughout our history." James A. Maxwell, *Fiscal Policy, Its Techniques and Institutional Setting*, New York, Henry Holt, 1955, p. 106. Cf. U.S. Department of Commerce, *Historical Statistics of the United States*, Washington, GPO, 1949, pp. 299-301.

ment orders for goods produced in the private sector and involve substantial buildup of production in the private sector prior to delivery of completed items to the Government. This latter feature will attract much of our attention in analyzing the economic impact of the various phases of the Federal spending process. However, neither the analysis nor its applications are limited to military spending and various sections deal with questions relating to nonmilitary programs.

In its attention to the need for new measurements of government spending this study is not intended to disparage the usefulness of the currently used measures but to add to the existing stock of valuable indicators which has been developed through the years. In some way, this study is written in the spirit of the following "call" issued by C. Lowell Harriss:

The call for greater clarity which this paper tries to make is by no means a call for either a single or a simple concept. Needs are so varied that no single concept of government spending can be best for all purposes.⁵

THE FEDERAL GOVERNMENT SPENDING PROCESS

Much of this study is devoted to analyzing the economic impact of the government spending process. This chapter describes the lengthy and intricate process through which Federal Government expenditures are made.

BASIC AUTHORIZING LEGISLATION

The first step in the process is the enactment of basic legislation authorizing a given agency, program, or activity. Some statute, such as the permanent authorization for the Council of Economic Advisers or the annual authorization for the mutual security program, must be on the books before an appropriation can be enacted to provide funds for the agency or program involved. This is the result of Congressional procedure rather than statutory requirement.⁶ Basic authorizing legislation of this nature does not ordinarily contain financial authorization enabling an agency to obligate government funds or to make expenditures. The request for funds is usually the next step in the spending process.

There are a number of exceptions. Some basic authorizing statutes do simultaneously grant Federal agencies financial authority of various types. The Federal-Aid Highway Act, for example, both authorizes the program of aid to the States and enables the Bureau of Public Roads to commit the Federal Government to make specific grants for highway construction.⁷ The annual appropriation request is merely to "liquidate" the obligations previously incurred.

Many government corporations and other business-type enterprises, particularly those operating lending programs, are authorized by basic legislation to spend the receipts from their operations without securing annual appropriations from the Congress.⁸

⁵ Harriss, *op. cit.*, p. 353.

⁶ The House rule provides that "no appropriation shall be reported in any general appropriation bill, or be in order as an amendment thereto, for any expenditure not previously authorized by law * * *." The Senate rule is generally similar. *Constitution, Jefferson's Manual, and Rules of the House of Representatives*, H. Doc. No. 766, 80th Cong., 2d sess., Washington, Government Printing Office, 1949, rule 21, clause 2; *Senate Manual Containing the Standing Rules, Orders, Laws and Resolutions Affecting the Business of the United States Senate*, S. Doc. No. 11, 81st Cong., 1st sess., Washington, Government Printing Office, 1949, rule XVI, clause 2.

⁷ Public Law 627, 84th Cong.

⁸ Budget and Accounting Act of 1921 (31 U.S.C. 11-16); Budget and Accounting Procedures Act of 1950 (Public Law 784, 81st Cong.).

On the other hand, the conduct of the military establishment has been sanctioned by the Constitution; and no general authorizing legislation is necessary; only appropriations enacted by the Congress are needed to enable it to spend government money for its operations.

It is important to consider the increment of legislation which is proposed each fiscal year—the extension of expiring legislation, the enactment of new legislation, and the modification or repeal of existing statutes—for this is the birth stage of new governmental spending programs.

REQUESTS FOR NEW FUNDS

In January of each year the President transmits to the Congress the budget for the coming fiscal year, the 12-month period beginning the following July 1. The budget contains the President's estimates of the Federal Government's needs for new appropriations in the coming fiscal year.

From time to time exigencies arise which were not foreseen in the preparation of the budget, and which require the President to make further requests to the Congress. The enactment of legislation not included in the budget or the necessity of unanticipated commitments of the United States in international conflicts have resulted in such supplemental requests.

CONGRESSIONAL ENACTMENT

Within the next 6 months, and sometimes over a longer period, the Congress reviews and modifies the President's recommendations and enacts the appropriation bills for the coming year.⁹ The total of financial authorizations made available to the Federal agencies for a given year is composed of a number of types of enactments.

The most prevalent type is the ordinary appropriation, which empowers Federal agencies (1) to place orders, enter into contracts, or otherwise commit or "obligate" the Government to make expenditures in the future, and (2) to make the expenditures required by such obligations. In the fiscal year 1960, 97 percent of the total amount of financial authorizations were of this type.¹⁰

Another type of financial grant is the contract authorization. This empowers the agencies only to incur obligations. In these cases, the agency has to make a later request for an appropriation to pay for or "liquidate" the obligation. Such appropriations are *pro forma* and are usually only given perfunctory review by the Congress.

Authorizations to expend from debt receipts are often used to finance lending and other government enterprises where proceeds from operations may repay the initial advances from the Treasury. These authorizations to make expenditures from borrowed money may take the following forms: (a) authorization for the Treasury to make public debt receipts available to a given enterprise, often in exchange for notes of the enterprise; (b) authorizations for a government enterprise to borrow directly from the public; and (c) cancellation of notes issued by a government enterprise to the Treasury, where the

⁹ The Constitution provides that "No money shall be drawn from the Treasury, but in consequence of appropriations made by law" (art. I, sec. 9(7)).

¹⁰ *Budget of the United States Government for the Fiscal Year Ending June 30, 1962*, Washington, Government Printing Office, 1961 (hereafter referred to as *1962 Budget*), pp. 14-15. A number of appropriations are "permanent"; that is, they do not require annual enactment by the Congress. Most trust funds operate under this form of obligational authority.

cancellation has the effect of permitting further expenditures to be made (through restoring previously used authority to borrow from the Treasury.)

The availability of obligational and expenditure authority is the same as that of ordinary appropriations. However, authorizations to expend from debt receipts need not go through the appropriations committees and are not included in the congressional tally of appropriations enacted.

Most financial authorizations are enacted for a 1- or 2-year period and expire if not obligated during that time. Because of the lags in Federal procurement, there are often requests to extend such authorizations beyond the original period of enactment. The effect of reauthorizations is generally the same as if new authorizations were voted in their place.

The total of appropriations and other financial authorizations made available to the agencies for a given year is called "new obligational authority." Table I shows the various types of new obligational authority which were enacted for the fiscal year 1960. Their common characteristic is that they empower the agencies to obligate the Government to make expenditures in the future.

TABLE I.—Types of new obligational authority, fiscal year 1960

(In millions)	
Appropriations ¹	\$76, 829
Authorizations to expend from debt receipts.....	1, 801
Contract authorizations.....	760
Reappropriations.....	184
Total	79, 574

¹ Excludes appropriations to liquidate contract authorizations totaling \$505 million.

Source: 1962 Budget, op. cit., pp. 14-15.

These authorizations are termed new obligational authority because they exclude the unobligated balances of prior-year obligational authority which are still available for current obligation. The total of funds available for obligation, which is of importance for budgetary control, includes both new obligational authority and the unobligated balances.

The granting of new obligational authority is a major control point over Federal spending. Given the grant of new obligational authority, the usual functioning of governmental operations will result in a subsequent flow of expenditures.

APPORTIONMENT OF FUNDS

After the Congress has voted funds, the control of expenditures shifts back to the executive branch. The rates at which appropriations are obligated and expenditures are made are determined by the departments and agencies, subject to the control of the Bureau of the Budget.

The Bureau of the Budget apportions to the agencies each quarter the funds appropriated to them. The apportionment power arises from the desire to prevent agencies from spending their appropriations early in the year and returning for deficiency appropriations.¹¹

¹¹ Executive order 6166, dated June 10, 1933, gave the Bureau of the Budget the authority for making, waiving, and modifying apportionments of the appropriations of the various agencies. Previously this authority had been vested in the heads of the agencies.

The apportionment process does not cover the operations of trust funds or privately owned government-sponsored enterprises.¹²

The apportionment power has been used to keep the amount of government spending for a particular item below the full limit of funds granted for it by the Congress. This use has been defended on a number of grounds, including the need to make Federal spending patterns conform to changes in circumstances and needs arising after the congressional enactment of funds.¹³ The General Appropriation Act of 1951 affirmed the legal authority of the President and the Bureau of the Budget to take such actions. The Act provided that:

In apportioning any appropriation, reserves may be established to provide for contingencies, or to effect savings whenever savings are made possible by or through changes in requirements, greater efficiency of operations, or other developments subsequent to the date on which such appropriation was made available.¹⁴

Following the making of apportionments, which is a centrally administered control, allotments are made by agency heads to administrative units within the agencies. Allotments may be made on a monthly or quarterly basis and may limit the use of obligational authority in terms of objects to be purchased, activities, or organizational units.

Gerhard Colm believes that the system of allotments and reserves could be developed into "an important instrument of fiscal policy."¹⁵ It has been used for that purpose only in rare instances. Examples of such action would be "impounding" funds during inflationary periods and freeing them for expenditure during recessionary periods.

INCURRING OBLIGATIONS

Within the limits of the apportionment of funds made available to them, the Federal agencies place orders, award contracts, buy goods and services, and take other similar actions which obligate their apportioned funds.¹⁶ This is the stage of the Federal spending process which is measured by "obligations incurred." To the extent that the goods and services needed by the Government are ordered from and produced in the private sector, this is the first stage of the process where government procurement activity directly involves private industry. It is also the last clearly discretionary step in the process which will ultimately involve government payment of funds.

Some instruments of contract are not considered as part of the total of obligations incurred. Letters of intent, interim devices by which the contractor is authorized to proceed with production before detailed contract terms are agreed upon, are no longer treated as budget obligations.

"Obligations" may be incurred for a wide variety of objects, in addition to the purchase of bonds and services from the private sector. Purchases of goods and services from the public sector itself, transfer, interest, and subsidy payments, grants to State and local governments, and purely financial transactions are also included.

¹² U.S. Bureau of the Budget, *Circular No. A-34*, Washington, 1952.

¹³ J. D. Williams, *The Impounding of Funds by the Bureau of the Budget*, Inter-University Case Program, No. 28, University, Ala., University of Alabama Press, 1955.

¹⁴ General Appropriation Act, 151 (64 Stat. 595).

¹⁵ Gerhard Colm, *Essays in Public Finance and Fiscal Policy*, New York, Oxford University Press, 1955, p. 190.

¹⁶ The law provides that "no contract for purchase is to be made except under an adequate appropriation" (41 U.S.C. 11). There are a number of specific instances where a Federal agency may place an order in advance of an appropriation (25 U.S.C. 99).

PRODUCING GOVERNMENT-ORDERED GOODS

Pursuant to the contracts and orders placed, the suppliers of government goods and services, in both the public and private sectors, produce or otherwise obtain and then deliver the items previously obligated for. Government contracts usually contain delivery schedules. In the case of heavy equipment, however, production delays and delivery date extensions are commonplace and the amount of control by the Government over the speed of work on the contract depends on the ability of the procurement officer as well as the cooperation of the contractor.¹⁷

To the extent that production is carried on in the private sector, this stage of the Federal spending process is not usually reflected in the Federal financial accounts. The fact that disbursements to factors by government contractors do not appear in the government accounts at this stage but in the private accounts will be of considerable significance in the subsequent analysis of the economic effects of the governmental spending process.

In the case of production carried on by a government agency, the actual disbursements to factors in the course of production are reflected as expenditures in the Federal accounts. In the case of expenditures which are not for currently produced goods and services, such as transfer payments, interest payments, and the acquisition of land, the lag between obligations and expenditures is usually nonexistent or at a minimum, depending upon the nature of the individual program involved. Moreover, such expenditures do not involve the long production lead times that are characteristic of hard-goods procurement.

MAKING PAYMENTS: THE CONCLUDING STEP

In accordance with private business practice, the Federal Government generally pays for the items it orders after they have been delivered, inspected, and approved. A number of agencies are authorized to make advance and progress payments.¹⁸ These are usually confined to large orders for heavy equipment in the production of which the supplier requires considerable additions to his normal working capital.

Progress payments can usually be made up to 70 percent of the costs incurred or 85 percent of direct labor and material alone.¹⁹ No interest is charged the contractor on such payments.

Advance payments are made, prior to the performance, under a contract and are expected to be liquidated from payments due the contractor as a result of performance. Unlike progress payments, advance payments are made under restrictive and selective conditions.

Only \$47 million worth of advance payments by the Department of Defense were outstanding as of December 1959. In contrast, \$2.6 billion of progress payments were outstanding on that date.²⁰ Such

¹⁷ U. S. Commission on Organization of Executive Branch of the Government, *Task Force Report on Military Procurement*, Washington, Government Printing Office, 1955, p. 34.

¹⁸ Armed Services Procurement Act of 1947, as amended, First War Powers Act, 1941, as amended.

¹⁹ Department of Defense, *Armed Services Procurement Regulation*, 1960 edition, Washington, Government Printing Office, 1960, p. E49.

²⁰ U. S. Congress, Joint Economic Committee, *January 1969 Economic Report of the President*, Washington, Government Printing Office, 1959, p. 703.

payments have been concentrated in heavy procurement where production time and hence the lag between obligations and deliveries is the longest.

THE LAGS IN THE PROCESS

As a result of the number of steps involved in the Federal spending process and because of the length of time often required by suppliers to produce the goods ordered by the Government, there is, in aggregate, a substantial lag between the time expenditures are authorized and the time they are made.

The lags in the early stages of the process are primarily administrative. It takes time for the agencies to prepare and obtain approval of their apportionment requests, for specifications to be drawn up for individual orders, and for contracts to be awarded. The length of this period has been attributed to "the time-consuming nature of planning."²¹

The lag may depend in part on the newness of the program and the necessity for establishing new procedures. The average lag of about a year between granting of new obligational authority and the placement of contracts in the 1933 Public Works Administration program was reduced to 100 days for the 1938 program.²²

A later and more important lag is technological, the lag between the letting of contracts and the beginning of quantity production. This is a period of "make ready," which may range from a few weeks to more than a year. In the typical case of a complex new military item, hundreds of additional engineers are hired and trained; hundreds and sometimes thousands of detail drawings are made; production lines are laid out; material requirements are computed; schedules are prepared for deliveries of material and components to be procured; and subcontracts are negotiated.²³

Table 2 shows an estimate of the numbers of years which may elapse between contract negotiation and quantity production for typical military items. This stage varies from approximately one-half year in the case of military uniforms to over two years for bombers and jet fighters. Following quantity production, there is the delay between delivery to the Government and payment for the goods delivered. This includes the time needed for inspection, processing vouchers, and making disbursements.

TABLE 2.—*The lag between ordering and producing typical military items*

Illustrative items:	Number of years ¹
Military uniform.....	1/2
Medium tank.....	1 1/4
Recoilless 57 mm. rifle.....	2
Destroyer DD 692.....	2
Transport plane.....	2
Bomber.....	2 1/4
Jet fighter.....	2 1/4

¹ The time shown for each item represents the span from the end of contract negotiation until the first unit comes off the production line set to deliver at the scheduled rate.

Source: Based on materials contained in *Defense Production Record*, May 15, 1952, p. 1.

²¹ Federal Reserve Bank of New York, *Selected Economic Indicators*, 1954, p. 73.

²² John Kenneth Galbraith, assisted by G. G. Johnson, Jr., *The Economic Effects of the Federal Public Works Expenditures, 1933-1938*, National Resources Planning Board, Washington, Government Printing Office, 1940, p. 28.

²³ Drawn from materials in U.S. Director of Defense Mobilization, *Second Quarterly Report to the President*, Washington, Government Printing Office, July 1, 1951, pp. 7-8.

A study of experience of the Air Force casts some light on the total lag in the Federal spending process. The Air Force is crucial in this connection because it accounts for so much of the "hard goods" purchased by the Government, the heavy equipment with long production time. Of the total new obligational authority granted to the Air Force for the fiscal year 1951, only 25 percent was spent in that year. Forty percent was spent during the following year and 28 percent was spent during the third year. The remaining seven percent was allocated between the fourth and fifth years. (See table 3.)

TABLE 3.—*Relationship of expenditures to new, obligational authority, United States Air Force, fiscal years 1951-53*

[Percent expended]

New obligational authority	1st year	2d year	3d year	4th year	5th year
1951.....	25	40	28	6	1
1952.....	23	36	30	9	2
1953.....	29	35	25	8	3
Average.....	26	37	27	8	2

Source: U.S. Senate, Committee on Appropriations, Hearings on Department of Defense Appropriations for 1953, Washington, GPO, 1952, p. 607. (Chart inserted by Secretary of the Air Force Thomas K. Finletter.)

As would be expected, purchases of "soft goods" and services do not evidence such a time-consuming lag. The Bureau of Labor Statistics examined reports on almost all Federal contracts for commodities for the calendar year 1947 distributed by both delivery date and date of award. In addition, several agencies made available to the Bureau their listings of expenses in terms of both obligations and expenditures.

As a result of analyzing this data, it was concluded that the lag between obligations and expenditures was negligible for soft goods, although often substantial for hard goods.²⁴ The Bureau of the Budget has reported a similar general finding:

In the case of salaries and wages, travel, and like items, the lag between obligations and expenditures is usually no more than a few weeks or a few months.²⁵

There are certain legal limits to the lags in the Federal spending process. Most forms of new obligational authority are available for obligation for either 1 or 2 years and are available for expenditures for no more than 2 years beyond that. Within these legal limits, the lag between the Government's embarking on a program and its execution is largely determined by private decision making. Military procurement, however, is financed largely from "no-year" appropriations, which are available until spent; most lending programs are likewise financed primarily from authorizations without specified expiration dates.

It was estimated that 68 percent of the new obligational authority requested for fiscal year 1962 would be spent in that year with the remainder (except for minor amounts of lapsing appropriations) being spent in future years. Also coincidentally, only 68 percent of the expenditures in that year would be made out of the authority granted

²⁴ Irving H. Licht, "Government," Conference on Research in Income and Wealth, *Input-Output Analysis*, Technical Supplement, New York, National Bureau of Economic Research, 1954, pp. 2-13.

²⁵ 1962 Budget, *op. cit.*, p. 10. In 1957, the Bureau estimated the lag for personal services, printing, travel, and transportation expenses at from 15 to 140 days. Michael S. March, "A Comment on Budgetary Improvement in the National Government," *National Tax Journal*, June 1952, p. 173.

in the year. The remaining expenditures would come from authority granted in prior years.²⁶

The nature of the lag between new obligational authority and expenditures makes for a changing relationship during the different stages of a buildup; new obligational authority (and obligations incurred) run sharply ahead of expenditures as orders are being placed and initial production gets underway. As the bulk of the spending program is put on order, the gap between new obligational authority and expenditures narrows. Finally, as quantity production is completed and deliveries are made, expenditures continue rising and exceed new obligational authority.

From time to time, attempts have been made to reduce the lag in the Federal spending process. Improved procurement procedures and organization are helpful. More important are steps which have been taken to reduce the technological lag. A number of states have adopted procedures which lessen the lags between authorization and expenditure. The system of "preadvertisement" of bids permits potential government contractors to get their orders to the mills well in advance of actual construction. In the case of the New York Thruway, the State called for superstructure bids for a new Hudson River crossing near Albany several months in advance of the actual letting of contracts for substructure.²⁷

REDUCING GOVERNMENTAL SPENDING

The actions which can be taken to curtail expenditures would operate in somewhat the same fashion as the actions involved in making expenditures. A reduction in government spending can be initiated at various stages in the spending process. The effects of the actions taken at each stage can be cumulative in their effects on the total of expenditures during any given period.

For example, the Congress may decide to eliminate or to reduce the scope of a particular program by changing its basic statutory authorization, or by eliminating or reducing the amount of funds authorized for it during a given period. These actions can be implemented either through eliminations or through reductions in the amount of new obligational authority being considered or in the rescision of existing obligational authority.

Independently of congressional action, the President may decide that a given agency should not spend all of its available obligational authority. This decision can be implemented by reducing its quarterly apportionment of funds and placing a portion of the appropriation "in reserve."

The individual agency can reduce the amount spent for a program by slowing down the rate at which it obligates its funds, by obtaining a slowdown in the rate at which the particular goods or service contracted for are produced and made available to the agency, or by rescinding contracts and other commitments it had previously entered into.

Most government contracts provide for their cancellation in the interests of the Government.²⁸ There are important obstacles to the reductions in expenditures which can be made through rescisions of

²⁶ *Federal Budget in Brief, 1962*, Washington, Government Printing Office, 1961, p. 58.

²⁷ *Engineering News-Record*, July 5, 1956, p. 26.

²⁸ Department of Defense, *Armed Services Procurement Regulation, op. cit.*, p. 851.

outstanding contracts, such as the payment of damages to the contractor for the unrecoverable costs which he has incurred, or the loss of interest on the part of business firms in bidding on future government contracts. This factor is a limitation both at the legislative and agency levels. In the case of such activities as public works projects, the desire to protect the government investment already made may be decisive in continuing expenditures on a going project in the face of a general effort towards curtailment of government spending. Most supply and construction contracts permit the contracting officer to order certain changes in the performance of the contract. The order of the contracting officer, so long as it is within the scope of the changes clause involved, does not require the consent of the contractor.²⁹

SUMMARY

The Federal Government spending process can be viewed as a continuous stream of activity. Four major stages may be highlighted because of their importance in terms of the impact of government spending on the economy: (1) the granting of congressional authorizations to let contracts and make expenditures; (2) the placing of contracts by government agencies; (3) production of the goods and services ordered by the Government; and (4) delivery of the finished product and the government payment.

The granting of financial authorizations by the Congress and the letting of contracts by the agencies are basic control points over the amount and rate of spending; the actual production generates the direct effect on the level of output in the economy (in those cases involving government purchases of goods and services). The flow of expenditures has important financial effects, including the use of Federal tax or debt receipts and the increase in the liquidity of the private sectors of the economy; it also measures the completion of the government spending program.

Subsequent chapters will explore the impact on the economy of each of these stages under varying circumstances and for different types of governmental spending programs.

EFFECTS ON THE ECONOMY OF AN INCREASE IN GOVERNMENT SPENDING

In this chapter four phases of the Federal Government spending process are highlighted: (1) enactment of appropriations, (2) placement of government contracts with the private sector, (3) production in the private sector to meet these contracts, and (4) delivery to and payment by the public sector.

A number of simplifying assumptions are made so that the effects on the economy arising directly from an increase in governmental spending can be more readily examined. More complicated situations are dealt with in the following chapter.

An increase in government spending is assumed which consists entirely of expenditures for goods and services currently produced in the private sector of the economy. It is assumed that these expenditures are financed by borrowing idle funds.

It is also assumed that there are sufficient idle resources and mobility in the economy to produce the goods and services ordered by the

²⁹ *Ibid.*, . 70p1.

Government without new fixed business investment or price or wage increases and without displacing any private demand. Also postulated is the availability of adequate financing for the government contractors by the private credit market. It is further assumed that this increase in government spending will generate no indirect psychological effects on consumer or business expectations nor any changes in other government programs.

PHASE I. APPROPRIATION OF FUNDS

It is assumed that the President transmits to the Congress a supplemental appropriation request which it enacts after due deliberation. Under the assumed conditions, there is no immediate effect on the economy as measured by any indicators of economic activity, such as GNP or the index of industrial production or any of the lead series, such as the volume of new orders. Neither is there yet any change registered in any of the measures of government spending.³⁰ This stage may take one to two quarters of a year, on the average.

PHASE II. PLACEMENT OF CONTACTS

The government agency to which the appropriation is made negotiates and places contracts with business firms in the private sector of the economy. The following are some of the events that would flow from the receipt of a government order by a manufacturer.

He finds that he cannot fill the order out of inventory or from existing production lines. He determines that this additional volume of production can be obtained through more intensive utilization of existing capacity, but that it will require substantial increases in inventories of materials and increased working capital which will have to be obtained outside of the firm.

On the basis of the company's past performance and the government order, the contractor obtains a working capital loan from his bank. He begins to place orders for materials, to hire additional workers, and to subcontract parts of the order to other firms. These suppliers or subcontractors will be going through a similar process at this time, in some cases involving another tier of suppliers or subcontractors.

The first effect on the volume of economic activity will now be taking place. As deliveries begin to be made on raw materials, and as wages are earned by the first of the newlyhired workers who are tooling-up, the contractor will be drawing upon his loan authorization and making small amounts of payments to the various factors of production. An increase will be registered in the outstanding loans of the commercial banks and, *cet. par.*, in the total money supply of the economy. Also, an increase will occur in gross private domestic investment. This latter item is the component of GNP which contains the inventory accumulation resulting from the increased amounts of goods in process.

The economic activity represented by contract placements is not reflected in any of the generally used measures of government spending. These contracts are included, but not identified separately, in the monthly reports by the Department of Commerce on new orders received by business firms.

³⁰ As is pointed out in ch. V, the series on budget expenditures, cash payments, and government purchases all measure essentially the payment stage of the spending process (phase IV).

That the placement of government orders ("obligations incurred" by the Federal agencies) is the phase of the government spending process which energizes private production on government account has been noted by a number of observers:

The initial stimulus to production is provided by government contracts for procurements.³¹

* * * it is the placing of a contract, or its anticipation, which leads industry to plan its acquisition of materials and labor and to schedule its production.³²

The initial impact of Government purchases results when new orders are placed * * * New orders initiate a demand for raw materials, working capital, and labor required in manufacturing the products. The flow of new orders has had an important influence on inventory policy and rate of production in certain durable goods and industries such as transportation equipment and primary metals, where defense orders represent an important part of their total business.³³

It is in the stimulus to productive activity rather than in the minor amounts of initial "make ready" production that the contract placement stage exercises an important effect on economic activity.

PHASE III. PRODUCTION OF GOODS

As quantity production gets under way on the government order, payments are made by the government contractor for wages to the employees engaged in the work, materials delivered, and the interest due on the working capital loan. He will also be accruing profits on the order.³⁴ The costs incurred by the contractor during the entire production period, i.e., the "value added," should total the amount of the order.

The outlays of government contractors are not reflected in government purchases of goods and services nor in any other government expenditures series at the time they are made. These outlays will currently show up in GNP—in the change in inventory segment of gross private domestic investment.

Inventories, as measured in the national income accounts, include the following kinds of goods: (1) all types of raw materials and supplies that must be kept in stock if production is to flow smoothly; (2) a certain quantity of goods in semifinished state, so-called work in process; and (3) stocks of finished goods. Accordingly, government-ordered production in the private sector will show up in GNP (on a value-added basis) as it goes through the above three stages prior to its receipt by the Government and its recording as a government expenditure.

The *Survey of Current Business* has explained the phenomenon quite clearly:

After work starts on government contracts, there is a considerable period, depending upon the type of goods in question, during which such production is recorded as private investment—specifically, as a component of the change in business inventories. It is only upon delivery of finished goods that government expenditures are affected.³⁵

The amount of production on government orders remaining in business inventories during a given period cannot be identified in the

³¹ Melvin Anshen and Francis D. Wormuth, *Private Enterprise and Public Policy*, New York, Macmillan, 1954, p. 530.

³² John Perry Miller, *Pricing of Military Procurements*, New Haven, Yale University Press, 1949, pp. 24-25.

³³ Federal Reserve Bank of Philadelphia, "The Budget for 1956," *Business Review*, February 1955, p. 11.

³⁴ "It is * * * a generally accepted accounting procedure to accrue revenues under certain types of contracts and thereby recognize profits, on the basis of partial performance * * * Particularly where the performance of a contract requires a substantial period of time from inception to completion * * *" American Institute of Accountants, *Restatement and Revision of Accounting Research Bulletins*, New York, 1953, p. 95.

³⁵ *Survey of Current Business*, November 1950, p. 8.

available statistics and, hence, the amount of production carried on in the private sector on government account cannot be measured. Only a general idea can be obtained from series on contracts placed and deliveries made.

On the income side, increases will be registered in compensation of employees, corporate profits, rental income and, perhaps, earnings of unincorporated enterprises. Increases in consumer expenditures also occur as a result of these income payments.

This stage may last from one quarter up to two years or more depending on the production time involved.

PHASE IV. PAYMENT FOR GOODS

During phase IV the contractor delivers the Government the goods which have been produced during phase III. Following inspection and other processing activities, payment is made by the Government. Several economic effects of this activity can be discerned.

The delivery of the equipment shows up in the national income accounts as a decline in business inventories and, hence, in gross private domestic investment. It also is recorded as a government purchase of goods and services. These two movements tend to cancel each other out with no net effect on GNP. The government purchases do not represent payments to the factors of production but are more in the nature of intersectoral transfers—reimbursements to the government contractor for his outlays during the previous period.³⁶

Following the payment by the Government, the contractor would repay the working capital loan. These actions tend to reduce the amount of private credit, reduce the Government's cash balances, and increase the cash position of the firm doing business with the Government. The contractor can now disburse dividends, or set aside funds for tax payments, future expansions or merely an improved cash position. The necessary public debt securities will be marketed during this time.

This is the period during which the government purchase shows up as a budget expenditure and a cash payment to the public.

RECAPITULATION

Table 4 is an illustrative version of the relationship through time between the four major stages of the Federal spending process and aggregate economic activity. It is assumed that in stage 1, the Congress authorizes a Federal spending program of 50, with no immediate effect on GNP. During stage 2, contracts are let with private firms which begin necessary tooling up operations. The relatively minor production activity involved is reflected in GNP. During stage 3, quantity production is carried on in the private sector on government account and this is the period during which the significant effect on GNP occurs. As yet, no government expenditures have been made.

³⁶ Cf. Samuelson and Hagen on the World War I experience: "The producer borrowed money or used his own funds to finance production; later, when the goods were delivered, the Government payment replaced the funds. The contribution to purchasing power had occurred earlier." Paul A. Samuelson and Everett E. Hagen, *After the War—1918-1920, Military and Economic Demobilization of the United States*, National Resources Planning Board Pamphlet, Washington, Government Printing Office, 1943, p. 23.

TABLE 4.—*Illustrative impact of the major stages of the Government spending process*

State of spending process	Business inventory accumulation	Government purchases	All other	GNP
1. Authorization.....				
2. Contract placement ¹	+5			+5
3. Production.....	+45			+45
4. Payment.....	-50	+50		

¹ Includes tooling-up expenses incurred prior to quantity production getting underway.

NOTES:

1. Assumes a hypothetical 1-shot Government spending program of 50.
2. Amounts shown are changes from the levels obtaining in period "0."
3. Only direct and primary effects are shown in the table.
4. Fluctuations in economic activity likely to arise from other causes are not shown here or in subsequent amplifications.

During stage 4, the government-ordered goods are completed and delivered. This is the period when government payments are made. However, while the total of government purchases of goods and services rises to reflect the payment, there is an equivalent reduction in business inventory accumulation. Hence, there is no net effect on GNP during this period.

In practice, the sequence is not always as simple as outlined above. While the Congress is considering a new appropriation for military procurement, the affected industry may be conducting preliminary discussions with the government agencies involved and may also be tooling up. Stage II may be quickened and an expansion in inventories begun as soon as the contracts are negotiated.³⁷ Also, after the initial lag between production and deliveries, there may be a steady stream of production in the private sector and deliveries to the public sector. This would result in no further need for inventory accumulation and the increases in GNP resulting from this government program would then show up in government purchases of goods and services, rather than in gross private domestic investment, as postulated above,

However, given the simplifying assumptions which have been made, the following is the sequence in which the various stages of the governmental spending process ordinarily enter into the movements of total economic activity.

1. The enactment of an appropriation indicates the size of a government spending program (for the period for which the funds are appropriated), but is not reflected in any measure of current economic activity.

2. The placing of government contracts with the private sector gives rise to the beginning of production and, hence, furnishes a measure of the early and potential impact of government spending (i.e., procurement) on the economy.

3. The actual production in the private sector on government account shows up in GNP as additions to business inventories. This is the stage when government contractors actually make disbursements for wages and materials. However, because of the lack of available statistics, we cannot measure the magnitude of these disbursements, which represent the amount of private production on government account. Increases in consumer spending also occur during this period as a result of the payments to factors.

³⁷ Gardner Ackley, "The Multiplier Time Period: Money, Inventories and Flexibility", *American Economic Review*, June 1951, p. 357.

4. The completion of production of the goods and services ordered results in deliveries from the private sector to the Government. This is the stage where the government spending program shows up as government purchases of goods and services. With the simultaneous decline in private inventories of a corresponding amount, there results no net effect on GNP during this period. However, this is the point at which the Government generally makes its expenditures for the goods and services delivered to it—when this activity is recorded as a budget expenditure and a cash payment.

OTHER TYPES OF GOVERNMENT SPENDING PROGRAMS AND PROCEDURES

Without relaxing many of the simplifying assumptions made earlier, other payment and production procedures and other types of government expenditures can be examined.

Other payment arrangements. Many government contracts provide for partial payments as the work is progressing. This is frequently done on heavy equipment orders such as aircraft, where the production time may take several years and where privately obtained working capital is not normally sufficient during this period to cover the payments to factors.

Advance and progress payments reduce the contractors' need for outside financing. To the extent that some of the benefit of these payments is passed on to the subcontractors or suppliers, their need for additional financing is diminished. Government cash balances would be drawn upon during the production period rather than after delivery of the equipment, as would occur under more usual payment arrangements. Hence, a stream of borrowing from the public might be necessary instead of a single funding effort at the final payment stage (or similar adjustments in scheduled repayment of government borrowing).

Progress and advance payments show up as budget expenditures and cash payments to the public at the time they are made. In the case of the income and product accounts, such payments in theory are included in private inventory accumulation rather than in government purchases. The customary practice, however, of the business firms which receive progress payments against partially completed work is to list the goods in process as receivables from the Government rather than as inventory.³⁸

The Department of Commerce attempts to adjust for this divergence, but does not have the necessary data in all cases. To the extent that the adjustment is made when necessary, production will be currently reported as increases in business investment; advance and progress payments, as well as completion payments, will show up as government purchases of goods and services at the time the delivery of the completed item is made.

Other production arrangements. A substantial segment of government purchases of goods and services is made directly from the public sector. Conventionally, this gross product of the public sector is taken as the compensation of general government employees.³⁹

³⁸ "Unbilled costs and fees under such (Government) contracts are ordinarily receivables rather than advances or inventory * * *" American Institute of Accountants, *op. cit.*, p. 93.

³⁹ "1954 National Income Supplement," *Survey of Current Business*, p. 53.

Where a Federal agency, to enable it to increase its staff, is granted a supplemental appropriation, or a regular appropriation larger than it received for the previous year, it can begin to hire new personnel as soon as it receives an apportionment of funds. Funds are obligated as the personal services are rendered. Limited by an initial administrative lag, usually of one to two weeks, the funds are expended as biweekly payments for services as they are rendered. Hence, the lag between obligations and expenditures is at a minimum. From the viewpoint of economic activity, the payments to factors (government employees) are recorded as government purchases of goods and services when the services are rendered and when payments are made. There is no time lag involved for intersector transfers as is the case for goods and services which the Government buys from private business firms.

However, even Government programs which are basically administrative in nature involve the purchase of supplies and other goods and transportation and other services from the private sector. The actual purchasing patterns of Federal Government agencies are characteristic of this "mixed" case. It is essentially a question of degree. In the case of the General Accounting Office, about 97 percent of the outlays for a given year were wage payments to government employees. The General Services Administration, in contrast, spent about 80 percent of its funds on supplies and materials produced in the private sector and only seven percent on wage payments to its own employees. Most government agencies fall somewhere between these two extremes.⁴⁰

In the important case of government programs involving the procurement of heavy equipment, the bulk of the production is usually carried on in the private sector. Moreover, it is precisely these programs which involve long production lead times and the consequent buildup of private inventories on government account. Military and foreign aid programs are the most important representatives of this group and it is in these areas where abrupt and large shifts in magnitude and timing are most common.

Other types of government spending programs. Many government spending programs are not for current output and do not directly enter into gross national product, although they may be part of other national income accounts. In addition to purchases of goods and services, government spending may go for the following: transfer, interest, and subsidy payments which do not constitute a government demand for output but are income to the receivers; grants-in-aid to State and local governments which primarily affect economic activity as they are utilized by the non-Federal governmental units and then would be included as purchases of goods and services, transfer payments, etc.; intragovernmental transactions which are purely internal transfers of funds and do not directly affect the public or the economy generally; and purchases of "used" assets such as land and second-hand equipment and loans to private recipients, which are on capital account for both the spender and the receiver.

The timing of the economic effects of these types of government spending programs, may differ from that of purchases of goods and services.

⁴⁰ U.S. Bureau of the Budget, *Summary of Obligations by Object, 1954.*

Normally, transfer and interest payments only affect the level of output after a lag and indirectly, as they are respent by the recipients. This is the reverse of the situation obtaining in the case of government purchases where the effect on output levels normally precedes the government expenditure. Anticipatory effects could take place under certain circumstances, such as newly unemployed workers maintaining a certain level of spending in anticipation of the future receipt of unemployment compensation.

The accruals of interest can have some economic effect in advance of the actual payment. Some bondholders report interest on an accrual basis for tax purposes. Also, the knowledge that their net worth position is growing stronger may also influence the spending decisions of some investors.

Subsidy payments, to the extent that they have favorable repercussions on the expectations of producers, may evoke a positive effect in advance of the government expenditure. The prospect of a subsidy could encourage farmers to increase production. In some cases, such as where the Government is a major purchaser of the commodity, the subsidy may be an alternative to a price rise and the total level of government spending may be reduced. There might not be any change in real output, but a rise might be averted in its monetary value. This has been experienced in wartime in conjunction with the operation of a system of price controls.⁴¹

Grants-in-aid to State and local governments normally affect economic activity as they are utilized by the non-Federal governmental units. State and local purchases of goods and services with the Federal funds would have similar results as direct Federal purchases. Likewise, State and local transfer payments financed by Federal funds would have similar results as Federal transfers. However, circumstances can arise under which the very act of the Federal Government in embarking on a new or expanded grant-in-aid program, or even its anticipation, can evoke an important stimulus in private or State and local activities in advance of any specific payment or even pledge of funds to a State.

The expansion in 1956 of the program of Federal grants for highway construction furnishes such an example. In advance of the congressional authorization of a \$38 billion program over a 16-year period, potential suppliers such as cement producers and manufacturers of road building equipment began to plan for expansions of capacity and markets. The States undertook advanced planning of highway projects with the result that every State had some qualifying projects either "well into the design stage or ready to go."⁴²

As soon as the program was enacted into law, the Federal Government acted to achieve the expansive effects. The Secretary of Commerce immediately announced, "We are starting the greatest public works program in the history of the world. * * * Its favorable impact on the economy is already felt."⁴³

The Commerce Department followed with a release claiming that 118,000 additional workers would be engaged in highway construction

⁴¹ Office of Price Administration, *Problems in Price Control: Stabilization Subsidies*, Washington, Government Printing Office, 1947, pp. 18-22.

⁴² "Can the States Meet the Challenge?" *Engineering News-Record*, July 5, 1956, p. 23. Cf. also issue of June 7, 1956 prior to passage of the bill, "Many States and cities have had their sights set on the expanded Federal highway program for the last 18 months. Speedup of existing programs will follow quickly upon enactment of the legislation" (p. 26).

⁴³ "Federal Highway Spending Termed a Quick Shot in Arm to Economy," *Wall Street Journal*, July 2, 1956, p. 4.

within 5 years and that the demand for steel for highway construction during that period would expand by 86 percent, that for cement by 79 percent, and that for explosives by 60 percent.⁴⁴

The reaction in the supplying firms was similarly optimistic. The Associated General Contractors of America stated that the program would generate \$200 million of additional highway construction during the first 2 months following its passage and an additional \$200 million during the following 4 months.⁴⁵

Federal loan programs provide a number of variations in the timing of the economic impact of government spending. The main effect of the government loan would normally rise from the subsequent purchases made by the recipient of the loan. For example, housing loans can be used to finance new private residential construction; production loans can be made to business firms and to farmers for inventory accumulation and, ultimately, for sales to consumers, to governments or to other private businesses; and loans can be made abroad for net foreign investment.

In some cases the Government may merely take over existing loans and increase the liquidity of private firms or individuals. The secondary mortgage operations of the Federal National Mortgage Association are of this nature. However, in assuring commercial lenders that there will be a standby secondary market, FNMA undoubtedly has encouraged commercial lending for housing mortgage purposes. Also, through the device of advance commitments, FNMA has at times functioned virtually as a primary lender.⁴⁶

In some circumstances, the expansive effect of governmental lending would precede the government disbursement. This would be true if private firms order goods and services, hire additional employees, and begin production on the basis of the Government's commitment to make the loan at a later date. In many instances, private production may take place soon after the making of the loan by the Government. In the case of agricultural production, the loans would be used to acquire implements, feed, and other items needed before production could get under way. Here the expansive effect on economic activity would normally follow the making of the loan by the Government.

Government purchases of land and other existing assets merely add to the liquidity of the recipients. Only to the extent that the proceeds are used to purchase current output rather than other existing assets will there be any resultant increase in the level of economic activity.

EFFECTS ON THE ECONOMY OF A CHANGE IN GOVERNMENT SPENDING: RELAXING THE SIMPLIFYING ASSUMPTIONS

Some of the possible effects on the economy of the operation of the various phases of the governmental spending process are examined under more complicated circumstances than in the previous chapter.

ANTICIPATORY EFFECTS

In the simplified situation it was assumed that the new government spending program would be neutral in its effects on consumer and

⁴⁴ Department of Commerce, Bureau of Public Roads, release dated July 25, 1956.

⁴⁵ *Wall Street Journal*, July 2, 1956, p. 4.

⁴⁶ Leo Grebler, *The Role of Federal Credit Aids in Residential Construction*, National Bureau of Economic Research, 1953, Occasional Paper 39, pp. 36-49.

business expectations. Consumers may not foresee any adverse repercussions on the availability or price of commodities, or they may believe that their stocks of hoardable commodities are adequate to meet any temporary shortages that may occur. Also, their purchasing power, including the availability of credit, may be severely limited. All of these circumstances would dampen any advance wave of consumer buying.

Businessmen may also believe that there is no need to alter their plans. The magnitude of the government program may not be very great, the duration may be limited, or the government program may be a part of a large stabilization policy. Under these circumstances, there may be no significant change in expectations, although in the absence of the governmental stabilizing action business expectations might have become less optimistic.

The Government's act of embarking on a large new program can have a positive "announcement" effect on consumer and business expectations. Such was the case in the early stages of the Korean mobilization program when memories of World War II price rises and shortages set off a wave of private ordering and buying in advance of government purchasing.

TABLE 5.—A new Government spending program, giving rise to favorable private expectations

Stage of spending process	Consumer expenditures	Business inventory accumulation	Government purchases	All other	GNP
1. Authorization	+10	+10	-----	-----	+20
2. Contract placement	-----	+5	-----	-----	+5
3. Production	+35	+45	-----	-----	+80
4. Payment	+5	-50	+50	-----	+5

NOTE.—Amounts shown are changes from the levels obtaining in period 0 and are based generally on table 4.

Table 5 shows, in an idealized fashion, how favorable expectations on the part of business and consumers resulting from the Government embarking upon a spending program can be superimposed on the direct effects of such a program. The present case includes an "announcement" effect of the government authorizations on consumer spending and business inventory accumulation. The subsequent developments are similar to those in table 4, except that the "second round" effect on consumer spending is specifically indicated here.

Private business investment may sharply accelerate in advance of any large increases in government ordering. If the Government embarks on a program to alleviate recessionary conditions, businessmen's hopes for an upturn may be raised. As Hamberg points out, under these circumstances:

* * * the marginal efficiency of capital may rise sufficiently to provide an increase in private investment independent of the immediate effects of rising current spending (public and private). The extent of this upward shift in the investment *schedule* would depend on the confidence that businessmen had in the success of the government's efforts.⁴⁷

The reaction of businessmen to this new government spending program may be negative. They may fear that such activities are a

⁴⁷ D. Hamberg, *Business Cycles*, New York, Macmillan, 1951, p. 357.

prelude to government interference and competition with private enterprise.⁴⁸ The announcement effect of government spending is too diffuse and elusive to be measurable. We simply do not know what the actions of businessmen and consumers in a given period would have been in the absence of the anticipatory effect of government activity.

Measures of the magnitude of the new government spending programs may prove helpful in gauging the anticipatory reactions of the private sector. Although there is no precise relationship between the granting of new obligational authority and anticipatory reactions, sharp and sizeable changes in the magnitude of this measure can throw light on some of the early reactions to changes in government programs.⁴⁹

AVAILABILITY OF RESOURCES

In the examination of the simplified situation in the preceding chapter, it was assumed that the placing of contracts by the Government would, in effect, start the wheels of industry turning. Resources, however, may not always be present. Substantial amounts of new investment may be necessary before production commences.

In this case, the production by private business would include additions to private plant and to equipment needed to produce the government-ordered goods as well as including actual production on the goods destined for government use.

There are several important distinctions between these two activities. Although both groups of expenditures would show up initially in gross private domestic investment, the capital expenditures would be included as additions to plant and equipment and would remain in the stock of private business assets. The production on government account, on the other hand, would initially show up as business inventory accumulation but, as the production is completed, would be transferred from this segment of business investment to government purchases of goods and services and the items produced would become part of the stock of government assets. Table 6 shows the operation of these two different types of production activities arising from government orders.

TABLE 6.—A new Government spending program requiring additional private investment

Stage of spending process	Consumer expenditures	Private fixed investment	Business inventory accumulation	Government purchases	GNP
1. Authorization					
2. Contract Placement					
3a. Investment		+10	+5		+15
3b. Production	+35		+45		+80
4. Payment	+10		-50	+50	+10

Note: Amounts shown are changes from the levels obtaining in period 0 and are generally based on Table 4.

Under a situation of relatively full utilization of resources, the letting of additional government contracts may simply result in accumulations of backlogs and unfilled orders. Given the limitation of resources, this problem cannot be remedied by additional investment

⁴⁸ Cf. Hayes' statement on the 1937 recession, " * * * who could tell where the experimenters would turn next?" Douglas A. Hayes, *Business Confidence and Business Activity: A Case Study of the Recession of 1937*, Ann Arbor, University of Michigan Press, 1951, p. 120.

⁴⁹ See ch. VII for details of recent experience along these lines.

in productive facilities. Placement of contracts by the Government would not immediately affect private production. Attempts by the Government to bid away resources from private uses could result in rises in prices. However, there would not be any real increase in the total production of the economy, except that resulting from changes in the product mix.

Where the Government resorts to material controls and allocation systems to obtain the output it needs, the backlogs may accumulate in the private sector rather than in the work on government contracts.

Table 7 illustrates the full employment situation in which the Government utilizes direct economic controls to draw resources away from private uses. As full utilization of resources is postulated, there would be no effect on the aggregate level of economic activity during any part of the government spending program. The authorization of the new spending program could not give rise to any changes in consumer and business outlays (resulting from changes in expectations) nor could the contract letting lead to any expansion in the volume of production. As a result, when production of the government-ordered goods is completed, there would be an increase in government purchases and an equivalent decline in consumer expenditure and/or business fixed investment depending on which private demands were displaced.

TABLE 7.—A new Government spending program requiring compulsory transfer of resources

Stage of spending process	Consumer expenditures	Private fixed investment	Business inventory accumulation	Government purchases	GNP
1. Authorization.....	-----	-----	-----	-----	-----
2. Contract placement.....	-----	-----	(1)	-----	-----
3. Production.....	-----	-----	(1)	-----	-----
4. Payment.....	-40	-10	-----	+50	-----

¹ Although the total level of inventories would be unaffected by the new Government spending program, the portion devoted to Government-ordered production would be increased during these periods (and decreased in the subsequent period).

NOTE.—Amounts shown are changes from the levels obtaining in period 0.

There is also the special case where the government contractor can fill the order out of existing inventory. Here production would not commence until the firm hires labor and other factors to replace the depleted inventory. The government payments in this case would initially add to the supplier's working capital and would constitute income only with a lag—when they are paid out to the factors of production for replacement of the depleted inventory.

As could be seen in the above cases, the usefulness of the measures of the early phases of the government spending process in analyzing current economic developments varies with the surrounding circumstances. The volume of government orders affords an insight into the Government's demand for current private production and future production. However, the relation between new orders and the ensuing production depends on the availability of resources. Here, unliquidated obligations (unfilled government contracts) are an indicator of future production on government account.

FINANCING PRIVATE PRODUCTION

It was assumed earlier that the government contractor can obtain financing and thus, once facilities and materials are available, can effectively carry on government-ordered production.

In a report to the Hoover Commission it was observed that the need for short- or long-term borrowing to finance current operations becomes much greater when a firm takes on government contracts:

Capital borrowings in the performance of Government contracts are frequently made necessary because of common delays in obtaining payment such as the slow processing of invoices, delays encountered in obtaining definitive contractual instruments authorizing payment, Government revisions of delivery schedules which delay or stretch out deliveries over a longer period, thereby prolonging investments in inventories, and other Government action * * *⁵⁰

Retained earnings are often a firm's prime internal source of working capital while bank credit is a major external source. Here can be seen the possible ramifications and interrelations of fiscal and monetary policies. A liberal money market would tend to quicken and ease the expansion of business credit while a tight one might tend to have an adverse effect. In this connection, taxation which impinges on savings and thus reduces the supply of loanable funds would tend to have a tightening effect on the availability of external business financing. Also, such fiscal measures as changes in the level of corporate taxation and in the treatment of undistributed profits could strongly affect the extent of internal financing.

The liberalization of advance and progress payments tends to ease the financing problems of government contractors. Other governmental devices to ease the demand of government contractors for working capital are the delivery of government-owned raw materials and of semifabricated items for processing or for assembly and the utilization of government-owned inventories. All of these methods result in increasing the current assets controlled by business firms working under government contracts. To the extent, consequently; that these financial arrangements are carried on, business concerns do not have to rely solely on their own resources to find the capital and the credit necessary to support current production.

In the absence of governmental assistance, there may be financial as well as technological limits to expansion of production on government orders. As can be seen by the large array of governmental devices designed to ease the financing problems of government contractors and by the performance of the American economy during wartime, these financial limitations have generally not been controlling.

FINANCING THE GOVERNMENT EXPENDITURES

In the simple situation examined in the previous chapter, it was assumed that the government payments to contractors would be financed by borrowing idle funds. It would be more usual for the Government to finance a large increase in the level of expenditures through raising the level of taxation or through borrowing active investment funds or by means of a combination of the two. In the short run, some increases in expenditures could be financed by drawing down the government's cash balances.

⁵⁰ National Security Industrial Association, *Report to Commission on Organization of the Executive Branch of the Government Regarding Military Procurement*, Washington, 1954, p. 57.

The economic effects of expenditures are not generally independent of the means of financing them. For example, increasing individual income taxes tends to offset the increased consumer incomes (and subsequent expenditures) resulting from the payments to the factors of production made by the government contractors. Similarly, raising the corporate income tax reduces the funds available for the payment of dividends and for internal financing. Government borrowing operations may compete with private uses of funds.

There would also be a reciprocal effect on the public sector due to the government-induced expansion in the private sector. Unemployment compensation payments tend to decrease in periods when increased production, including government-ordered production, results in a lower level of unemployment. Also, increases in consumer and business incomes tend automatically to result in greater Federal revenues, especially with the existence of a progressive tax structure.

REDUCING GOVERNMENT SPENDING

In general, the effects on the economy of a reduction in spending are the reverse of the ones traced for the expansion of government expenditures. A curtailment of new obligational authority leads to a reduction in the volume of orders placed which in turn leads to a reduction in private production on government account. The end result is a reduction in government expenditures.

In practice, complicating factors will arise analogous to the ones examined in the preceding discussion of expansion in government spending. The very act of embarking upon a contraction of government activity can have an "announcement" effect on business and consumer anticipations. The exact nature of this response will vary with the surrounding circumstances.

Under circumstances of a large pent-up private demand for goods and services the curtailment of government demand may evoke waves of private buying of both consumption and investment goods. In other circumstances, the heralded decline in government purchasing may lead to a reduction in the total demand for the goods and services produced in the economy. Under such circumstances, announced reductions in government spending (as indicated by lower annual amounts of new obligational authority) will have a dampening effect on the private sectors of the economy in the absence of any large amounts of unsatisfied nongovernmental demand.

Declines in new government orders and cutbacks and rescissions of existing contracts have an immediate repercussion on business firms heavily dependent on government demand. Ackley has shown that in the case of a contraction in demand for production the crucial factor may be the length of irrevocable commitments to suppliers and to the factors of production.⁵¹ However, if a seller has inventories which exceed what he feels to be the necessary minimum under the new circumstances, he can contract his production prior to the completion of his contracts (subcontracts from the Government's point of view) and can fill the balance out of inventory. Prompt settlement of contracts terminated by the Government helps to free working capital, to clear plants of special inventories and equipment, and to permit business to attain normal production patterns.

⁵¹ Ackley, *op. cit.*, p. 361.

A complicating factor in the analysis is the role of unexpended balances of authorizations available to Federal agencies.⁵² Unless these balances are rescinded or put in reserve, the agencies can continue to use the unobligated portions of these balances to place new orders and let contracts in the absence of any current grant of new obligational authority. Approximately 52 percent of the balances carried into the fiscal year 1962 were unobligated, primarily representing available authorizations to expend from debt receipts.⁵³

CHANGES IN RATES AND LEVELS

There are a number of situations in which the placement of new orders *per se* may not have any significant effect on economic activity or an effect different from that postulated above.

"Followon" orders, extending and maintaining existing production levels, tend to result in continued stability rather than in any net increment in total demand.

In these instances, we may be approaching some variant of the acceleration principle. The placing of additional government orders with business firms and the subsequent production and delivery to the Government may not have a particularly stimulating effect on business investment or on the economy generally when the net result is to maintain a fairly constant level of government procurement.

TABLE 8.—*Illustration of achieving a higher level of Government spending.*

	Stage of spending process	Consumer expenditures	Business inventory accumulation	Government purchases	GNP
Period 1.....	{ Authorization of program A.....	+10	+5	-----	+15
	{ Contracts for program A.....	-----	+5	-----	
Period 2.....	{ Authorization of program B.....	+10	+5	-----	+20
	{ Production A.....	+35	+45	-----	
Period 3.....	{ Contracts B.....	-----	+5	-----	+100
	{ Authorization C.....	+10	+5	-----	
	{ Payment A.....	+10	-50	+50	+110
Period 4.....	{ Production B.....	+35	+45	-----	
	{ Contracts C.....	-----	+5	-----	+110
	{ Authorization D.....	+10	+5	-----	
	{ Payment B.....	+10	-50	+50	+110
Period 5, etc.....	{ Production C.....	+35	+45	-----	
	{ Contracts D.....	-----	+5	-----	+110
	{ Authorization E.....	+10	+5	-----	

NOTE.—In this illustration, once the new level of Government spending has been achieved, payments (expenditures) are an adequate indicator of the impact of Government spending.

Table 8 shows a typical four-stage reaction to a new government spending program, with favorable advance repercussions, necessary private investment, and indirect effects on consumer expenditure. To this extent, it is consistent with the earlier discussions, such as that relating to table 5. However, it is assumed that "followon" orders are placed which maintain the level of private production achieved with the original orders. The levels achieved during period 4 (when payment is made on the first series of contracts) are merely maintained in period 5 and beyond.

Finally, the permanency of the change in the amount of government procurement is important. When businessmen and consumers believe

⁵² Cf. Gilbert and Paradiso, on the private sector: " * * * The significance of an increase or decline in new orders depends largely upon the condition of unfilled order backlogs * * * " Milton Gilbert and Louis Paradiso, "National Income and other Business Indicators" (in Philip M. Hauser and William R. Leonard, *Government Statistics for Business Use*, New York, John Wiley & Sons, 1946) p. 45.

⁵³ 1962 Budget, *op. cit.*, p. 17.

than an increase in government spending will be lasting, they may react, particularly in investment decisions, far more fully than if they regard such increases as merely transitory. In this relationship, Wallich concludes that:

* * * one probably cannot assume that an increase in government orders will induce the same amount of private investment that might be called forth by higher private demand. This will be true, at any rate as long as government demand is regarded as less permanent than private demand.⁶⁴

SUMMARY

The magnitude of changes in the various phases of the Federal spending process can have important economic effects under many circumstances; an awareness of these surrounding circumstances is essential to an adequate analysis of the changes in government spending patterns.

The very act of announcing and authorizing a new or increased spending program—the granting of new obligational authority—can sometimes give rise, by affecting expectations, to positive or even to negative changes in business and in consumer spending in advance of the actual letting of contracts or of the disbursement of government funds.

The act of placing contracts and incurring other obligations may not always signal the onset of production. The needed production facilities may not be readily available or backlogs of orders may first have to be worked off. Also additional working capital may be required. On the other hand, the government order may be filled out of inventory and no effect on economic activity would take place until some time later.

In addition to the direct effects of the government expenditure there will be the accompanying effects of the financing of this outlay. Automatic increases in personal and corporate tax collections may offset in part the effects of the rise in government expenditures, including the spendings out of the earnings from government orders. Government borrowing, likewise, may compete with private demands. Reductions in the level of government spending also work their effects through the economy in an analogous four-step process.

Although all of these complications may modify the effect on the economy of a program of government procurement from private industry, the basic relationships generally hold: The primary effect on productive activity (to the extent there is any) occurs in advance of the actual government expenditures. Under most of the circumstances that have been examined, the placing of orders induces (either immediately or after a delay) private production on government account, and such production remains in the private sector and does not show up as government expenditures until after it is completed and the goods involved delivered to the public sector.

THE GENERALLY USED MEASURES OF GOVERNMENT SPENDING

This chapter examines the measures of government spending which are generally available and currently used. The three most widely-known measures are (1) budget expenditures, based on the Federal administrative budget, (2) Federal Government payments to the

⁶⁴ Henry C. Wallich "Income-Generating Effects of a Balanced Budget," *Quarterly Journal of Economics*, November 1944, p. 89.

public, prepared on a consolidated-cash basis, and (3) Federal purchases of goods and services, computed as a part of the national income and product accounts.

BUDGET EXPENDITURES

The conventional measure of Federal spending, budget expenditures, is the central series in the annual budget document.

Coverage. This total of spending generally includes all expenditures of the Federal departments and agencies plus the net outlays of the enterprises which are wholly owned by the Federal Government. It excludes the transactions of government-sponsored enterprises and trust funds and payments for retiring, purchasing, or redeeming the Government's debt. This treatment is similar to that of many business firms, whose budgets usually exclude the company pension funds and the operations of firms in which they have only a partial interest.

For the government enterprises which are included, usually only the net expenditures—the difference between gross disbursements and gross receipts—are reported in the total of budget expenditures.

A number of exceptions exist to this "net" treatment of government enterprises. Some government agencies which are not financially organized as business-type enterprises, notably Interior Department deposit the proceeds from their operations directly into the Treasury. In such cases, these receipts do not offset budget expenditures but increase the totals of budget receipts. Either treatment has the same effect on the budget surplus or deficit.⁵⁵

Basis of measurement. Budget expenditures are generally recorded at the time checks are issued by governmental disbursing officers. A major exception is interest payments on the public debt, which are reflected on an accrual basis. Other exceptions include cases where direct or guaranteed obligations are issued to discharge certain liabilities. These include the issuance of armed forces leave bonds to veterans and of guaranteed debentures to lenders holding defaulted FHA mortgages.

Budget expenditures include, in addition to disbursements directly from the Treasury of the United States, checks issued by government enterprises, such as the Panama Canal Company, from their checking accounts with commercial banks.⁵⁶ The logic of including both types of payments is apparent with the growth of Treasury tax and loans accounts with commercial banks, for in either case government funds are carried by a private bank. In the former case, the account is in the name of a government agency and, in the other, in the name of the Treasurer of the United States. The effect on the recipient of the government disbursement from these accounts is the same.

Changes in concepts. Through the years, the items included in the budget totals have varied considerably. Although this paper is based on the classification current during the time of writing, the more important changes in recent years are mentioned as an indication of the possibilities for future changes and improvements in the concepts and measurement of Federal finance.

A number of items previously included on both the income and outgo sides have been gradually excluded, such as payments to the Treasury

⁵⁵ Some departments receive revenues from services rendered to the public, such as performing special research studies. Their expenditure totals are reported net of such reimbursements.

⁵⁶ *Treasury Bulletin*, April 1954, p. A-2.

by wholly owned government corporations for retirement of capital stock and amounts refunded by the Government, principally for overpayment of taxes. The exclusion of these items from both the receipt and expenditure totals has no effect on the budget surplus or deficit.

Types of payments included. Because budget expenditures cover such a wide variety of government agencies, many different types of payments are contained. These include purchases of currently produced goods and services, transfer payments, interest payments, grants-in-aid to State and local government, subsidies, purchases of land and other existing assets, loans and other financial exchanges, and transfers of funds between government agencies.

The budget document does not contain a tabulation showing which expenditures fall in each of these categories; however, the supplementary material in the document has been expanded to present details on some of the categories, such as interest payments, grants-in-aid, and loans.⁵⁷

Role of the conventional measure. The series on budget expenditures is generally used for purposes of political and administrative budgetary control. This series also forms the basis of other series on government spending which are more useful for economic analysis; it is the only one that is "built from the ground up," appropriation account by appropriation account. The other measures consist solely of additions to and subtractions from the total of budget expenditures. Note in this connection the description of the derivation of government expenditures for the national income accounts:

The method, in general, is to start with the budgetary totals drawn from broad fiscal reports, then to make various additions to and deductions from these totals so as to achieve as residuals the desired purchase series.⁵⁸

The reporting of budget expenditures is a method of keeping track of outlays of government-owned funds over time. Many students of public finance believe that this series, compared to the other available measures, gives a better device for aiding in the management of government use of resources, especially for the long view.⁵⁹ In studying the costs of government programs, it is not often material whether wages are paid in full or retirement deductions are made or whether interest on the public debt is paid to the public or to government trust funds.

Gerhard Colm, on the other hand, states that "Adding up these administrative accounts does not necessarily give any meaningful totals."⁶⁰ Colm may be correct from the viewpoint of economic analysis. However, the series on budget expenditures contains the transactions of the governmental programs which are amenable to control through the appropriations process and hence, it is of value for budgetary review purposes.

From a purely fiscal standpoint, it is the budget surplus or deficit, based on budget expenditures and its counterpart series, budget re-

⁵⁷ 1962 Budget, *op. cit.*, Special Analysis D, pp. 997-1007.

⁵⁸ "1954 National Income Supplement," *op. cit.*, p. 146.

⁵⁹ C. Lowell Harriss, "Government Expenditure: Significant Issues of Definition," *Journal of Finance*, December 1954, p. 354.

⁶⁰ Gerhard Colm, "Fiscal Policy and the Federal Budget," (in Max F. Millikan, ed. *Income Stabilization for a Developing Democracy*, New Haven, Yale University Press, 1953) p. 209.

ceipts, which causes changes in the total of the public debt and in the Government's cash balances. Trust account surpluses or deficits, on the other hand, merely alter the proportion of the public debt held by these accounts.⁶¹ All expenditure series, including the conventional budget measure, exclude the effects of such important fiscal actions as guarantees of private loans, and commitments or contracts to make either future payments of benefits or to purchase goods and services.

FEDERAL GOVERNMENT PAYMENTS TO THE PUBLIC

The series on Federal payments to the public is often termed the "consolidated-cash" budget because it combines budget expenditures with the expenditures of other funds and eliminates transactions not involving the flow of cash from the Government. However, this series and its counterpart, Federal receipts from the public, do not comprise a budget but are a financial statement in the budget document and are generally based on the materials available in the detail of the budget.⁶²

Coverage. The government transactions in this series include, in addition to those of government-owned agencies and enterprises (which are included in budget expenditures), the funds which the Government holds in trust⁶³ and the operations of government-sponsored enterprises (except the Federal Reserve and Postal Savings Systems).

The major funds for which the Federal Government acts as trustee are the old-age and survivors' insurance fund; the railroad retirement fund; the veterans life insurance funds; and the civilian government employees retirement funds. The disbursements of these funds are primarily transfer payments to individuals covered under the various social insurance systems.⁶⁴

The government-sponsored enterprises include those in which the Federal Government has had a share of ownership from time to time: the banks for cooperatives, the Federal home loan banks, the Federal land banks, and the Federal Deposit Insurance Corporation.

Basic of measurement. Unlike the budget expenditure series which is on a "checks issued" basis, the cash payments series is on a "checks paid" basis. This transition is accomplished through adding in the total for the clearing account for outstanding checks, which adjusts for the checks which have been issued but not yet cashed.

In determining the cash totals, the total of budget expenditures is added to trust expenditures, and a number of adjustments are made. Table 9 shows the major adjustments, including deduction of intra-governmental transfers and non-cash transactions, which must be made in arriving at the cash total.

⁶¹ Certain other factors affect changes in the public debt and cash balances, such as direct borrowing from the public by Government enterprises and changes in the trust funds uninvested working balances.

⁶² 1962 Budget, *op. cit.*, "Special Analysis A," pp. 979-982.

⁶³ Note the comment of the Committee for Economic Development: " * * * if we want to weigh the effects of the budget upon private purchasing power, total demand, employment and prices, the budget must include these important collections and payments." *Taxes and the Budget*, New York, CED, 1947, p. 18.

⁶⁴ The Federal-aid Highway Act of 1956 established a highway trust fund to which receipts from designated highway-related excises are deposited and from which grants to the States are made. The extent to which these funds are not government-owned but are held in trust is rather questionable. The operation of this trust fund is closer to that of programs financed by earmarking budget receipts.

TABLE 9.—*Derivation of Federal Government payments to the Public, fiscal year 1960*

Description	[In billions]	Amount
Budget expenditures		\$76.5
Trust fund expenditures		21.8
Expenditures of government-sponsored enterprises .....		.5
Less:		
Intragovernmental transactions		4.1
Non-cash debt transactions (net) .....		.4
		94.3
Federal Government payments to the public		94.3

Source: 1962 Budget, *op. cit.*, p. 981.

Major intragovernmental transfers which are eliminated are budget and trust payments to Treasury, such as interest paid by government corporations; budget payments to trust funds, such as the interest paid on United States securities held by trust funds; and trust payments to other trust funds, such as the payment made by the District of Columbia to the civil service retirement fund.

Accrued budget expenditures in the form of increases in public debt are also eliminated. The most important such adjustment results from the savings bond program where semiannual increases in redemption value occur during the life of the bonds and are currently reflected in budget expenditures. A single cash payment of interest is made when the bond is redeemed, involving no additional budget expenditures. A cash payment, however, is then recorded for all of the interest earned.

Changes in concepts. No major conceptual revisions have been made in this series since 1947. A few changes have been made to reflect similar changes which have been made in the concept of budget expenditures such as in the method of handling refunds of receipts.

A companion series prepared by the Treasury Department, cash income and outgo, has undergone extensive revision. Prior to the 1954 change in Federal reporting, cash outgo was identical with cash payments, and cash income differed from Federal receipts from the public only by seigniorage on silver, which is cash income from the viewpoint of the U.S. Treasury but is not a receipt from the public.

Since the change, the Treasury cash series has been titled "Cash Deposits and Withdrawals" and is computed from the viewpoint of the Treasurer of the United States. Under this concept a transfer of funds from the Treasurer's account to the account of a government corporation with a commercial bank is recorded as a cash withdrawal. A payment by a government corporation to a private individual or to a business firm from such "outside" checking account is not included in cash withdrawals. In contrast the Budget Bureau series refers to payments to the public regardless of whether these transactions are carried on through accounts of the U.S. Treasury or through government agency accounts with commercial banks. The net difference between these two series is slight. Payments to the public in 1960 were \$94.3 billion compared to cash withdrawals of \$93.5 billion.⁶⁵

Types of payments included. Despite the various adjustments made in converting from the conventional to the cash basis, the measure of payments to the public is still essentially just as heterogeneous in coverage. From the viewpoint of gauging economic effects, the

⁶⁵ 1962 Budget, *op. cit.*, p. 982.

two main improvements over the conventional series are the elimination of intragovernmental and non-cash transactions and a more complete coverage of transfer payments through inclusion of the trust funds.

Role of the cash series. It is generally agreed that the series of Federal payments to the public is the most useful available measure of the total flow of money, excluding borrowing, from the Government to the public. Harriss concludes that "For studying the effects of fiscal action on the economy in the short run, the cash figures are most significant."⁶⁶

The difference between the Government's cash position and its budgetary position varies from year to year, the cash position usually appearing more favorable. The gap between the two methods arises largely from the operations of the trust funds. The largest trust funds are social insurance accounts which are currently accumulating reserves to meet future benefit payments and are expected to do so for many years.

The value of the cash payments series in analyzing economic impact is subject to similar limitations as budget expenditures, as pointed out in the official explanation of the cash statement:

* * * many Government activities besides receipts and expenditures have a bearing on the economy. For example, a rapid expansion in new appropriations and in Government orders could stimulate a rise in business activity long before the authorized funds were paid to the public. Federal guaranties and insurance of private loans may also affect activity in the economy, even though they normally entail relatively small Government expenditures.⁶⁷

FEDERAL PURCHASES OF GOODS AND SERVICES

The Federal Government component of the gross national product is Federal purchases of goods and services.

Coverage. The various agencies of the Federal Government are included in this measure, to the extent that their expenditures are for the acquisition of current output. The current accounts of government enterprises, however, are included in the business sector, and are shown as a deduction from GNP in computing national income.

Only the capital formation of government enterprises is included in government purchases of goods and services. The main reason for this treatment is to avoid classifying current business-type expenses of the Government as final purchases. It is admitted that this is "not more than a convenient means" of disposing of this conceptually indefinite but quantitatively small item in the income accounts. An indication of basic dissatisfaction with this *ad hoc* solution is the Commerce Department's conclusion that if government enterprise operations were to assume greater importance in the United States economy, "it is entirely possible that some modification of their treatment in the national income accounts would be called for."⁶⁸

The definition of government enterprises in the income accounts differs from that used in the other series that have been discussed. Included here as government enterprises are business-type activities whose expenditures are reported gross in the budget document and whose receipts from operations are included on the receipts side. On

⁶⁶ Harriss, *op. cit.*, p. 354.

⁶⁷ 1963 *Budget, op. cit.*, p. 982.

⁶⁸ "1954 National Income Supplement," *op. cit.*, p. 49.

the other hand, the Federal land banks are excluded because the Federal Government no longer has any financial interest in the banks.

Basis of measurement. Except for the treatment of government enterprises considered above, all purchases of currently produced goods and services by government agencies are considered to be final products and hence enter into the final output of the economy. The reasoning rests mainly on the fact that the general government is an ultimate buyer in the sense that it does not buy for resale in the market and, accordingly, its purchases are not elements of cost in the value of other output produced for the market.⁶⁹

This rationale omits any reference to the extent to which government goods and services actually do enter into the final product which business firms produce. According to Hicks, some part of the government output is not final product but "plays its part in production by facilitating the production of other goods (maintenance of law and order, roads used for business purposes, and so on). To reckon this as well as the goods whose output is facilitated would involve double counting."⁷⁰

To report government transactions consistent with the corresponding payments and receipts recorded for the business sector an adjustment is made to an accrual basis to reflect generally the time of delivery rather than the time of payment. This adjustment represents the net increase in accounts payable to business, less the net increase in outstanding advances and prepayments by the Federal Government, as computed from a number of sources including the surveys of corporate working capital by the Securities and Exchange Commission.

Charges in concepts. Until 1946, both government and private interest payments on debt were considered to be income according to the concepts underlying the official national income statistics of the United States. In that year, Federal interest payments on the public debt were excluded from government purchases of goods and services and treated as transfers.

The reasoning behind this change was that the Federal debt has come into existence primarily in connection with the financing of wars and the interest payments therefore do not reflect the acquisition of current output. The earlier treatment considered these payments as return to government bondholders for the use of their money, paralleling the treatment of interest on private indebtedness.⁷¹

A number of students of public finance have questioned the change. Earl Rolph states that it is "not obvious" that the differences between government debt and private debt are such that they justify such a radically different treatment of interest payments.⁷² Rolph shows that there is an inconsistency between treating government interest expenditures as transfers and the usual definition of what constitutes a transfer payment:

The crucial negative feature of the definition—that transfer income is not in return for services or products—appears to be generally held, whether the definition is stated as "no contribution to social product", "no specific quid for the specific quo rendered", or a failure to "enhance the production of economic values".⁷³

⁶⁹ Milton Gilbert and others, "Objectives of National Income Measurement: A Reply to Professor Kuznets," *Review of Economic Statistics*, August 1948, p. 183.

⁷⁰ J. R. Hicks, "The Valuation of the Social Income," *Economica*, May 1940, p. 118.

⁷¹ Gilbert and others, *op. cit.*, pp. 192-193.

⁷² Earl R. Rolph, *The Theory of Fiscal Economics*, Berkeley and Los Angeles, University of California Press, 1954, p. 59.

⁷³ *Ibid.*, p. 58.

Proponents of the change claim the practical value of not increasing the Federal component of GNP simply because the government borrows funds to finance its operations and, in the opposite instance, of not decreasing Federal purchases of goods and services whenever the Government retires debt (and hence reduces the volume of its interest payments).⁷⁴

Types of payments included. Federal purchases of goods and services consist of the output of the Federal Government sector and that part of the output of the private sectors that is purchased by the Government. The output of the government sector is measured by the wages and salaries of general government employees plus certain supplements paid by the Government as employer. The category of general government employees includes both military and civilian personnel but excludes the employees of government enterprises, whose current transactions are covered in the business sector. Supplements to wages and salaries cover such items as the Government's contributions to the retirement funds for its employees.

A number of significant types of government spending are not included in Federal purchases of goods and services. Some of them, however, are included in other parts of the national income accounts. For example, grants-in-aid to State and local governments are included with the outlays of those lesser jurisdictions; transfer and interest payments are included in personal income; and subsidies (including the current deficit of government enterprises) is an adjustment item used in computing national income from GNP. A total of Federal expenditures "on income and product account" can be built up using all of these components of government spending. (See table 10.) Although such a tabulation may be helpful for certain limited purposes, it is not as generally used a measure of government spending as are Federal purchases of goods and services.

TABLE 10.—Federal expenditures on income and product account, fiscal year 1960

Description	[In billions]	Amount
Purchases of goods and services.....		\$54.0
Transfer payments.....		21.9
Interest.....		6.1
Subsidies plus the current deficit of government enterprises.....		3.5
Grants-in-aid to state and local governments.....		6.5
Federal expenditures.....		92.0

Source: U.S. Congress, Joint Economic Committee, *Hearings on January 1959 Economic Report of the President*, Washington, Government Printing Office, 1959, p. 148.

There are other types of Federal spending which do not appear in any of the income accounts, such as transfers of funds between different government agencies, financial exchanges, and purchases of existing assets. An exception to this treatment is the price support loans made by the Commodity Credit Corporation. These are counted as purchases for inventory under the assumption that the loans are a preliminary step to the subsequent purchase.

Role of the series on Federal purchases of goods and services. The value of this series is derived primarily from its being a component of GNP. As used in analyses showing what constitutes the composition of demand for the final output of the economy, Federal purchases

⁷⁴ Gilbert and others, *op. cit.*, pp. 192-193.

of goods and services indicate the portion taken up by the Federal government. This is similar to personal consumption expenditures which represent the proportion of final product (other than housing) going to consumers and gross private domestic investment which represents the amount going to the business sector.

THE RELATIONSHIPS AMONG THE THREE SERIES

Table 11 shows the interrelationships among the series on budget expenditures, Federal payments to the public, and Federal purchases of goods and services. As can be seen, purchases by general government agencies of currently produced goods and services are included in all three series. The bases of measurement differ somewhat. The budget series is essentially on a checks-issued basis, the cash series on a checks-paid basis, and the purchases on a delivery basis.

TABLE 11.—Types of Federal Government spending included in 3 currently used series

Type of spending	Series in which included		
	Budget expenditures	Cash payments	Purchases of goods and services
Purchases of goods and services by general Government agencies	X	X	X
Wholly-owned Government enterprises:			
Capital outlays	X	X	X
Current outlays	X	X	
Transfer payments (including interest):			
From budget accounts	X	X	
From trust accounts		X	
Grants-in-aid	X	X	
Subsidies	X	X	
Purchases of existing assets	X	X	
Financial exchanges	X	X	
Intragovernmental transfers and noncash transactions	X		
Expenditures of government-sponsored enterprises:			
Federal land banks		X	
FHLB's, FCID, banks for cooperatives		X	X

The following categories are included in both the budget and cash measures but excluded from the Federal component of GNP; transfer payments from budget accounts, grants-in-aid to State and local governments, subsidies, current outlays of wholly owned government enterprises, purchases of existing assets, and financial exchanges, such as loans.

Transfer payments from trust accounts and the expenses of the Federal land banks are only included in the cash series. Intragovernmental and noncash transactions are only included in budget expenditures.

Common shortcomings of the three series. Despite the differences in the scope of transactions covered, all of the three series are closely connected. They are all variations of budget expenditures and generally measure the flow of the government spending process at its completion, when production is finished and delivery or payment is made.

Contrasted to this general uniformity of measurement, Federal spending is, as has been demonstrated in earlier chapters, a process, a flow of financial activity; "expenditures" or "payments" or "purchases" represent just one point among many in an often lengthy

series of actions. Under some circumstances, attention should be focused on the earlier phases of the spending process in order to adequately gauge or understand the economic impact of a government spending program, particularly one involving goods and services produced in the private sector.

Aside from the availability, one of the main reasons why the three "expenditure" measures can be so generally employed is that during a period of stability or little change in government operations, they are quite satisfactory. When the composition and level of government programs are stable, the length and complexity of the Federal spending process can usually be safely ignored. The current levels of authorizations granted, contracts let, production performed on government account and Federal expenditures incurred are all approximately the same for a given procurement program and any expenditure series is generally adequate to measure the impact on the economy.

As noted earlier, none of the measures of the early stages of the Federal spending process—such as the granting of spending authority or the making of commitments to spend—are among the economic series or indicators in current usage. It is the thesis of this study that such measures are of distinct importance to economic analysis and that their current absence is a gap in our knowledge. The following chapter is devoted to methods of preparing such series.

MEASURES OF THE VARIOUS PHASES OF THE GOVERNMENT SPENDING PROCESS

It is the purpose of this chapter to examine the availability of series on the government spending process and on the problems involved in filling existing gaps.

NEW OBLIGATIONAL AUTHORITY

The annual budget document shows new obligational authority for 3 years: the fiscal year most recently completed, the current fiscal year, and the following fiscal year. The latter two figures are, by their very nature, *ex ante* estimates. No estimates are prepared on a monthly or quarterly basis.

The absence of monthly or quarterly totals of new obligational authority may not be very important ordinarily due to the annuality of the appropriation cycle. The bulk of the funds for a given year are appropriated within a period of a few months around the beginning of the fiscal year and, hence, it is the differences in the annual totals for consecutive years or between the amount requested and the amount approved which are significant. In case of sudden and large changes in government spending programs, however, the timing of specific grants of authority may be important, particularly in gaging the impact on business and consumer anticipations.

The reported figures on new obligational authority exclude the operations of the trust funds and the government-sponsored corporations, whose transactions are not included in budget expenditures. However, they include all major changes in government spending programs affecting current output. The trust funds primarily disburse transfer payments and the sponsored enterprises primarily engage in banking and in insurance activities. These activities do not require annual congressional grants of new obligational authority, and they give rise to little anticipatory effects on the economy.

OBLIGATIONS INCURRED

There is no currently available, regularly issued series on the total obligations being incurred by Federal agencies. Since January 1958, this information has been made available annually in the budget document. The reporting lag is quite serious. Actual figures for a given year are not available until more than 6 months after the close of the year. Also, no monthly or quarterly breakdowns are prepared.

Annual series. Table 12 contains the figures for this series, as well as the series on new obligational authority and expenditures. Not all the obligations incurred will result at a later date in budget expenditures. The obligations of business-type enterprises such as the Post Office, which are reported "gross," are offset in good measure by the receipts from the sale of postage stamps, etc.; only a portion of the obligations actually result in net expenditures.

TABLE 12.—*Measures of the Government spending process*

[In billions of dollars]

Fiscal year	New obligational authority	Obligations incurred	Expenditures
1950.....	49.3	44.1	39.5
1951.....	82.9	83.1	44.0
1952.....	91.4	104.6	65.3
1953.....	80.3	85.6	74.1
1954.....	62.8	65.7	67.5
1955.....	57.1	74.7	64.4
1956.....	63.2	80.3	66.2
1957.....	70.2	69.0	69.0
1958.....	76.3	73.9	71.4
1959.....	81.4	80.6	80.3
1960.....	79.6	75.3	76.5

Source: 1962 Budget and earlier budget documents, and U.S. Bureau of the Budget, tabulations of obligations by object.

Although the relationship is not precise, it can be seen that often increases in the amount of new obligational authority granted by the Congress from one year to the next may lead to significant increases in the level of obligations incurred in that year or the next year and in actual expenditures in the following year. The experience during the period 1950-53 is a case in point which will be elaborated in the following chapter.

Quarterly series. Federal agencies furnish reports, generally at monthly intervals, showing the cumulative amount of obligations incurred under each appropriation account since the beginning of the fiscal year. These reports are received by the Bureau of the Budget on an individual appropriation account basis. No attempt currently is made to review this measure of the progress of government programs on an aggregate rather than a piecemeal basis. In earlier years, the Treasury Department issued monthly report, popularly known as the "White Book,"⁷⁵ showing the total amount of obligations incurred by Federal agencies. This publication was discontinued after the June 30, 1949, issue.

On the basis of a number of available sources, the writer has prepared a rudimentary series showing Federal Government obligations incurred, by quarters. This series is presented essentially for illustrative purposes. More exact series could be prepared by the Govern-

⁷⁵ U.S. Treasury Department, *Financial Statements Relating to the United States Government, Obligations, Expenditures, and Balances under Appropriations and Contract Authorizations*, Washington.

ment, provided that the agencies involved are directed to do so. The derivation of the quarterly obligations series is as follows:

1. *Department of Defense (military functions) and foreign military assistance.* The obligation figures for this category were obtained from the Department of Defense release, *Monthly Report on Status of Funds*. Although the concept of "obligations" used in the *Status of Funds* report is not precisely the same as that in the budget document, the annual totals are fairly close and the conceptual differences are relatively minor.⁷⁶ This report covers almost half of the total annual obligations to the Federal Government in recent years.

2. *Interest.* The figures for this category were obtained by using the data on budget expenditures for interest reported in the monthly *Treasury Bulletin*. This could be done because interest payments on the public debt are recorded both as budget expenditures and as obligations when the payable interest accrues rather than when cash actually is paid. This category covers approximately 10 percent of the total annual obligations at the present time.

3. *All other programs.* For historical periods, the annual obligations figures (other than interest and defense) can be converted to quarterly estimates by reference to the seasonal patterns which Federal procurement activities have generally followed through the years.

There is usually a high rate of obligating during the first few months of the fiscal year as the agency commits its new funds for the programs which it has already planned. A downturn in ordering usually takes place in the fall and carries through until the spring. A sharp increase in obligations occurs in the closing months of the fiscal year, due in part to the desire of agency officials to fully obligate their funds by the close of the fiscal year to avoid "losing" unobligated funds. Ordinary prudence would dictate to an administrative official that he maintain, in effect, an emergency fund for unforeseen contingencies by holding up until the end of the fiscal year outlays for certain desirable but postponable items.

This assumed seasonal pattern of Federal purchasing has been affirmed by the limited studies which have been made on the subject. An analysis of government purchasing for the Temporary National Economic Committee noted the concentration of government purchase orders in the latter part of the fiscal year 1938.⁷⁷

In his study of military procurement during World War II, John Perry Miller noted the tendency for the award of contracts to be "heavy" in the second quarter of each calendar year (the last 3 months of the fiscal year). He states that this was clearly a reflection of the desire of the agencies to commit funds before the end of the fiscal year to avoid the lapse of unobligated amounts.⁷⁸

The monthly obligation series for the last several fiscal years reported by the Treasury *White Book* also generally support the hypothesis. An analysis of the *White Book* renders the following

⁷⁶ For example, the *Status of Funds* report list obligations incurred by the Department of Defense (military functions) in the fiscal year 1954 as \$30 billion, while Budget Bureau worksheets indicate \$32 billion for the same period.

⁷⁷ Clem C. Linnenberg and Dana M. Barbour, *Government Purchasing—An Economic Commentary* Temporary National Economic Committee, Monograph No. 19, Washington, Government Printing Office, pp. 144-146.

⁷⁸ Miller, *op. cit.*, p. 25.

quarterly distribution of the non-defense, non-interest obligations of the Federal Government.⁷⁹

	Percent
1st quarter.....	28
2d quarter.....	18
3d quarter.....	25
4th quarter.....	29
Total.....	100

The above percentages have been applied in order to obtain a quarterly distribution of non-defense, non-interest obligations for the fiscal years 1951-1956. The results are contained in Table 13.

TABLE 13.—Obligations incurred by the Federal Government, by quarters

[Fiscal years; in billions of dollars]

Year and quarter	Defense	Interest	Other	Total
1951:				
1st.....	8.6	1.1	7.8	17.5
2d.....	8.7	1.3	5.0	15.0
3d.....	16.1	1.2	7.0	24.3
4th.....	16.3	2.0	8.1	26.3
Total.....	49.6	5.6	27.9	83.1
1952:				
1st.....	13.0	1.1	10.3	24.4
2d.....	13.0	1.7	6.6	21.3
3d.....	15.3	1.1	9.2	25.6
4th.....	20.6	2.0	10.7	33.3
Total.....	61.9	5.9	36.8	104.6
1953:				
1st.....	16.8	1.1	9.1	27.0
2d.....	10.4	1.9	5.9	18.2
3d.....	10.8	1.1	8.2	20.1
4th.....	8.5	2.4	9.4	20.3
Total.....	46.5	6.5	32.6	85.6
1954:				
1st.....	6.5	1.0	8.2	15.7
2d.....	6.0	1.8	5.3	13.1
3d.....	6.9	1.2	7.4	15.5
4th.....	10.5	2.4	8.5	21.4
Total.....	29.9	6.4	29.4	65.7
1955:				
1st.....	8.0	1.1	9.2	18.3
2d.....	8.7	1.9	5.9	16.5
3d.....	8.5	1.1	8.3	17.9
4th.....	10.1	2.3	9.6	22.0
Total.....	35.3	6.4	33.0	74.7
1956:				
1st.....	6.4	1.7	9.2	17.3
2d.....	9.4	1.7	5.9	17.0
3d.....	10.7	1.8	8.2	20.7
4th.....	14.0	1.7	9.6	25.3
Total.....	40.5	6.9	32.9	80.3

Source: Table 12; Office of the Comptroller of the Department of Defense, table dated August 26, 1953; Monthly Report on Status of Funds by Budget Category, June 30, 1956, p. 33; Treasury Bulletin, August issues, 1951-1956, p. 3.

Although different assumptions as to the precise quarterly distributions would have yielded different figures, the orders of magnitude and the direction of movement would be essentially similar. However, the important movements—both expansions and contractions—

⁷⁹ U.S. Treasury Department, *op. cit.*, issues for June 30, 1946-June 30, 1949.

during this period were taking place in the defense programs. In future periods, movements in non-defense programs may be the dominant feature in Federal spending patterns, and the rough approximations used here might not suffice so readily.

PRODUCTION ON GOVERNMENT ACCOUNT

In order to measure the production in the private sector on government account, a breakdown is needed in the current reports on business inventories showing how much relates to private orders and how much to government orders. Such information is not now available.

It would be difficult to obtain a breakdown of inventories between "government account" and others. Large amounts of equipment ordered by the Government are made in the same plants as producers' equipment and often from similar parts or materials. Many goods purchased by the Government are similar to or identical with civilian goods and are often made alongside them, with orders sometimes filled with common stocks. Problems would also be encountered in connection with subcontractors who are not always aware of the nature or destination of the final products into which their output is incorporated.

A limited attempt at measuring the amount of government-ordered production can be made through the use of the quarterly reports on the financial position of American corporations, which are jointly prepared by the Federal Trade Commission and the Securities and Exchange Commission. These reports, in presenting a consolidated balance sheet of corporations, show the amounts receivable by business from government and the amounts advanced by government, usually in the form of progress payments. These figures can be taken as a rough indication of the amount of production which has been completed and not yet paid for.

A number of companies do not list receivables from the Federal Government separately in their report.⁸⁰ Second, the receivable items measure a later stage of the process than is desired. They represent the completion of a certain amount of productive effort from the accountant's viewpoint of liability while the ideal measure would be the actual amount of production being carried on and the actual amounts being paid to the factors of production. Finally, in the case of continuing or "follow-on" orders, the levels of inventories add receivables remain fairly constant over an extended period, although considerable amounts of production are carried on and completed.

Nevertheless, this series provided a helpful indication of the amount of production currently being performed on government account in World War II. For example, at the outset of the defense program in December 1939, receivables from the Federal Government of 1,228 registered corporations were only \$21 million. On December 1941, the time of the attack on Pearl Harbor, these receivables were only \$525 million. However, by December 1943, the peak period of war production, they had risen to \$4.1 billion. As of December 1944, these receivables totalled \$3.8 billion and by June 1945 they had declined to \$3.3 billion.⁸¹

⁸⁰ Many companies have complained that they have difficulty in obtaining reports from the Government as to what their receivables are (accounts payable on the Government's books). Carman G. Blough, "Confirmation of Government Receivables," *Journal of Accountancy*, October 1955, p. 69.

⁸¹ Securities and Exchange Commission, *Working Capital of 1228 Registered Corporations*, released dated Dec. 5, 1945, Washington.

The fluctuations in this series in recent years have been on a smaller scale. For example, this series shows, to a limited extent, the buildup of private work on government orders during the Korean mobilization. Net receivables from the Federal Government increased by \$800 million during the fiscal year 1952 and by an additional \$300 million during the following year. In the fiscal year 1954, the trend was reversed and those receivables declined \$300 million. An additional decline of \$300 million was registered during the following year.⁸² These movements correspond to the general sequence of the Korean military procurement cycle, but the amplitude of the fluctuations registered are so small as to make the series of very restricted usefulness.

PAYMENTS FOR GOVERNMENT GOODS AND SERVICES

The measures of the final stage of the government spending process are the most highly developed and most frequently employed. The series on budget expenditures is reported in the *Monthly Statement of Receipts and Expenditures*, issued by the Treasury Department. Estimates, on a fiscal year basis, are contained in budget documents and midyear budget reviews. Historical data are contained in the budget document and in the monthly *Treasury Bulletin*.

The Treasury version of the cash-consolidated statement appears each working day in the *Daily Statement of the United States Government*. The Budget Bureau series, Federal payments to the public, appears monthly in the *Treasury Bulletin*. Estimates on a fiscal year basis are contained in the budget document and in the midyear review of the budget. Historical data are contained in the *Statistical Abstract of the United States* for the Budget Bureau series and in the *Treasury Bulletin* for the Treasury series.

Federal purchases of goods and services are reported quarterly by the Department of Commerce. The more inclusive measure, Federal expenditures on income and product account, appears in the annual national income number of the *Survey of Current Business*. Historical data for these series are contained in the "1954 National Income Supplement" and the national income numbers of the *Survey*.

Compared to the indicators of the earlier stages of the government spending process, the various measures of government payments are readily available and, hence, widely used and analyzed. Although there undoubtedly are a number of refinements which would be helpful to the analyst, these measures have been used over a comparatively long period of time and many of the "bugs" have been worked out and the uses and limitations identified as reasonably as could be expected. Accordingly, the present study has focused on filling the major gaps in the measures of the government spending process, rather than on developing minor improvements in the "expenditure" series.

AN ANALYSIS OF HISTORICAL EXPERIENCE, 1950-1954

The defense mobilization program upon which the United States embarked at the outbreak of fighting in Korea in 1950 furnishes an excellent example of how the responses to the various phases of a new government spending program work themselves out through the economy.

The Korean incident began in June 1950, as the American economy was recovering from the recession of 1949. An indication of the

⁸² U.S. Securities and Exchange Commission, releases on working capital of U.S. corporations.

outlook immediately prior to the Korean outbreak is furnished by a contemporary analysis:

Expansion in economic activity continues to be reflected in the major economic series, with rising production requirements tending to advance prices of many important industrial raw materials in recent weeks. Employment has continued to move ahead in response to the basic trend of business * * *. The fundamental characteristic of the current uptrend in the business cycle continues to be the sharp expansion in investment.⁸³

RAPIDLY EXPANDING ECONOMIC ACTIVITY: FISCAL YEAR 1951

The first year of the Korean effort—the fiscal year 1951—proved to be a period dominated by anticipatory actions of consumers and businessmen, engendered by a military campaign whose ultimate scope they could only dimly guess. On the military production front itself, this was a period of formulating strategy and plans, making ready, and tooling up.

In the first phase of transition to the defense program, a sharp and abrupt shift upward in business and consumer expectations began concurrently with the international developments which gave rise to the change of military policy. “* * * the public reacted very much as if in expectation of a World War III.”⁸⁴ Consumers bought most heavily commodities which had suffered quality deterioration in World War II. The larger volume of consumer buying contributed to increased demand all along the line.

Distributors' orders mounted as they attempted to maintain or build up stocks. Manufacturers' orders for raw and semifinished materials also rose substantially. Because there was little slack in the economy at the time, the effect upon prices and retail trade was prompt and vigorous. The Bureau of Labor Statistics wholesale price index jumped from 100.2 in June 1950 to 103.2 in July, and to 107.1 in September. Similarly, the consumers' price index rose from 101.8 to 104.4 during this period.⁸⁵

With the exception of the decontrol period following the close of World War II, this was described as “the most rapid and the most widely pervasive inflationary movement” in recent American history.⁸⁶ The general inflationary movement which gripped the economy during the quarters immediately following the Korean outbreak was unaccompanied by any significant increase in the volume of actual production on defense orders. Although near capacity operations were maintained in industries producing raw and semifinished materials, “on the whole defense output continues to represent a small fraction of the volume of total production.”⁸⁷

In July 1950, the President requested supplemental defense appropriations of \$10.5 billion.⁸⁸ The figure was increased by early August to more than \$15 billion to provide for heavier expenditures under the Mutual Defense Assistance Program and for additional naval aircraft. There was much speculation at the time as to the ultimate levels of defense spending. The following is an example of the more restrained reaction:

⁸³ *Survey of Current Business*, June 1950, p. 1.

⁸⁴ J. Frederick Dewhurst and Associates, *America's Needs and Resources: A New Survey*, New York, Twentieth Century Fund, 1955, p. 15.

⁸⁵ “1955 Statistical Supplement,” *Survey of Current Business*, pp. 26-27 (base of 1947-49=100).

⁸⁶ U.S. Congress, Joint Committee on the Economic Report, *Inflation Still a Danger*, Washington, Government Printing Office, 1951, pp. 12-13.

⁸⁷ *Survey of Current Business*, November 1950, p. 3.

⁸⁸ Message to the Congress of July 19, 1950.

(The rate at which we rearm) will obviously be greater than the \$31 billion that, as of mid-August, the administration has asked for fiscal 1951. Would it come to \$50 billion? Probably * * * In any case, a rearmament program of much greater proportions than the President had announced by the middle of August was clearly needed and is probably coming.⁸⁹

The *Harvard Business Review* contained a guess of "\$50 billion or \$60 billion" as the ultimate rate for military expenditures.⁹⁰

In September, supplemental military appropriations of \$17.8 billion were enacted and, on the same day, the Revenue Act of 1950 was passed, forecasted to yield an additional \$5.8 billion in Federal receipts at calendar year 1951 income levels.⁹¹ Also in September the Congress approved the Defense Production Act which authorized a broad program of production and stabilization controls.

A contemporary report illuminated the impact on the economy of government action during this period:

Since the Korean attack, the stepped-up defense program has been the basic influence in the expansion of business activity. For the most part the principal effects have been anticipatory, growing out of the projected expansion in Government spending in the year ahead.⁹²

Federal expenditures remained fairly stable during the fiscal year 1951. The automatic stabilizers tended to have the immediate effect of reducing nonmilitary Federal spending. Also, receipts increased substantially as a result of higher incomes and tax rates. The administrative budget yielded a \$3.5 billion surplus in 1951 while on a cash basis the surplus was \$7.6 billion. In contrast, the total amount of new obligational authority granted for the fiscal year 1951 increased 68 percent, rising from \$49.3 billion in 1950 to \$82.9 billion.⁹³

The amount of military orders and contracts let was virtually unchanged until the third quarter when it almost doubled, rising to \$16.1 billion. Contract letting was maintained at that rate for the final quarter of the year. The total amount of contracts let and other obligations entered into by the Federal agencies almost doubled in the first year of the Korean mobilization program, rising from \$44.1 billion in 1950 to \$83.1 billion.

The interplay during fiscal 1951 of the opposing tendencies of the various phases of the Federal spending process was clearly brought out in the following comment on this period by the Joint Committee on the Economic Report:

The ineffectiveness of the governmental cash surplus, normally a deflationary force, was, in large part, attributable to anticipatory forces on the inflationary side arising from the current or expected placement of orders for future deliveries.⁹⁴

GNP rose each quarter of fiscal 1951, for a total increase of 19 percent over 1950. Consumer expenditures declined in the second quarter, subsequent to American victories against the North Koreans. Consumer spending rose again in the third quarter during the buying spree following the adverse turn of events in Korea in December 1950 when the Chinese Communists entered the conflict. Inventory accumulation continued through the year while total private fixed

⁸⁹ *Fortune*, September 1950, pp. 69-70.

⁹⁰ Ernest A. Tupper, "Guideposts to Industrial Mobilization," *Harvard Business Review*, November 1950, p. 41.

⁹¹ U.S. Secretary of the Treasury, *Annual Report on the State of the Finances for the Fiscal Year Ended June 30, 1951*, Washington, Government Printing Office, 1952, pp. 44-45.

⁹² *Survey of Current Business*, November 1950, p. 1.

⁹³ *Budget of the United States Government for the Fiscal Year Ending June 30, 1954*, Washington, Government Printing Office, 1953, p. M6. (Hereafter referred to as *1954 Budget*.)

⁹⁴ U.S. Congress, Joint Committee on the Economic Report, *National Defense and the Economic Outlook or the Fiscal year 1955*, Washington, Government Printing Office, 1952, p. 49.

investment remained steady. After a slow start, Government purchases also began moving upward.

The fiscal year 1951 furnishes an example of the possible economic importance of the early steps in the Federal spending process. In the face of a budgetary surplus, the announcement of and authorizations and contracting for the Korean mobilization program set off the tremendous expansions in the economy that occurred during the year. As will be shown, the following year—the period of the actual major increase in Federal defense expenditures—was one of comparative stability in the American economy. By the time the peak in expenditures actually occurred, the necessary production facilities had already largely been put in place and had produced much of the output contracted for. The long awaited boom in Federal spending was in good measure discounted in advance—mainly in the fiscal year 1951.

RISING MILITARY PRODUCTION: FISCAL YEAR 1952

The second year of the Korean war—the fiscal year 1952—was a time of rapid increase in defense outlays. This was the period when the newly built production lines began to turn out completed military items in significant quantities. However, as the military situation in Korea greatly improved, consumers soon realized that the supply and price situation was not worsening either as much or as rapidly as they had originally feared. It was apparent that world war III was not in the offing.

Personal saving rose to 9 percent of disposable income in the first half of the year from a low of 2.7 percent in the first quarter of fiscal 1951. Retail sales slackened off appreciably. Continued expansion in defense outlays tended to be offset in part by declines in private investment.

Gross national product continued its quarterly rise, although at a slower pace than the previous year. The net expansion was primarily in the defense sector, as civilian output (GNP excluding defense purchases of goods and services) fluctuated between \$290 billion and \$293 billion a quarter at seasonally adjusted annual rates. Defense purchases increased almost 20 percent from the first to the fourth quarter of the year.

New obligational authority granted by the Congress for major national security programs totaled \$72.7 billion in 1952, an increase of 14 percent over the previous year.⁹⁵ Also the peak in contract letting and other forms of obligating defense funds was reached in 1952. Although the military obligation rate was lower in the first three quarters of the year than in the record second half of fiscal 1951, the yearly total of \$61.9 billion was the high for the entire Korean effort.

The beginning of fiscal year 1952 saw the industrial economy emerging from the "tooling up" stage on many military items and crossing the threshold of the period of volume production of hard goods. At the end of the first quarter, the Director of Defense Mobilization declared:

Military production is entering a new stage—a period when, on many of the new weapons, assemblyline production is beginning and the major problems will be in finding and breaking the bottlenecks that may be holding up the flow of arms off the lines.⁹⁶

⁹⁵ 1954 *Budget, op. cit.*, p. 1090.

⁹⁶ U.S. Director of Defense Mobilization, *Third Quarterly Report to the President*, Washington, Government Printing Office, Oct. 1, 1951, p. 1.

In general, the period following the Federal-Reserve-Treasury accord of March 1951 was one of credit restraint and price stability. On the fiscal side, the budget surplus in 1951 was converted into a budget deficit of \$4 billion in 1952. The provisions of the Revenue Act of 1951 were in effect during the last 8 months of fiscal 1952. Although the rise in personal income leveled off after the first quarter of the year, tax receipts in each of the first three quarters were about \$3 billion higher than the corresponding period in 1951. The increase in military deliveries was even greater. As a result, Federal expenditures rose each quarter, reaching the height of \$18.4 billion in the fourth quarter of the year.⁹⁷

The total of new obligational authority enacted for the year increased 10 percent over the 1951 figure, compared to a 68 percent rise the previous year. The total for 1952, \$91 billion, was the high point for the Korean mobilization. A similar dampening occurred in the obligations rate. Contrasted to an increase of 92 percent in the previous year, total obligations incurred by Federal agencies in the fiscal year 1952 rose 25 percent over the 1951 total to a record height of \$105 billion.

The governmental trust funds continued to accumulate reserves and, on a cash basis, Federal receipts from the public in 1952 were in approximate balance with Federal payments to the public. According to this measure, the financial operations of the Federal Government for the year tended to have a neutral effect on the economy.

Gerhard Colm points out that most of the rise in national security spending during this period occurred after prices had roughly stabilized.⁹⁸ That is, the actual higher level of Federal spending followed the strong expansion in the economy rather than accompanying it. However, the rapid rise in defense expenditure may at least have supported the increased level of prices.

According to an analysis prepared in the spring of 1952:

"It could be argued * * * that the direct effects of defense production now being felt are not nearly so upsetting to the economy as were the anticipatory effects a year or so ago * * *. The shortages failed to appear, prices declined, and inventory congestion plagued industry throughout most of the past year. In part, this reversal * * * stemmed from widespread misapprehensions about the impact and timing of the defense program."⁹⁹

This misapprehension may be a serious indictment of the data available to the Government and private analysts for gauging the economic impact of government spending and also of the lack of ability to interpret properly the data that were available.

PEAK LEVELS OF OUTPUT: FISCAL YEAR 1953

The fiscal year 1953, the third year after the outbreak of hostilities in Korea, was the peak period of the Korean cycle. All sectors of the economy reached record highs.

GNP for the year was \$358 billion, an increase of \$21 billion over fiscal year 1952. The level of consumer prices held extremely steady during the year, rising to 114.5 in June, only four-tenths of a point higher than at the start of the year. After declining 2.2 points in the

⁹⁷ *Treasury Bulletin*, August 1952, pp. 1, 7.

⁹⁸ Gerhard Colm with Marilyn Young, *Can We Afford Additional Programs for National Security?* Washington, National Planning Association, 1953, p. 9.

⁹⁹ "Production in a Defense Economy," *Monthly Review of the Federal Reserve Bank of New York*, March 1952, p. 39.

first half of the year, the wholesale price index was fairly constant in the last 6 months of 1953, fluctuating within a range of six-tenths of a point.¹⁰⁰

In transmitting the budget for the fiscal year 1953, President Truman pointed out that "the smaller amount of new obligational authority which I am recommending indicates the substantial portion of the financial requirements of our military buildup that has been met in the appropriations already made by the Congress."¹⁰¹

The 1953 total of \$80 billion in new obligational authority was \$11 billion or 12 percent less than the peak year of 1952. Similarly, the total amount of obligations incurred by Federal agencies was \$86 billion, a 6 percent decline from the previous year. Budget expenditures for the year, on the other hand, reached their Korean peak at \$74 billion—the largest total annual outlay by the U.S. Government since 1945.

The rise in military production and deliveries and, hence, expenditures leveled off during the year. Budget expenditures increased \$7 billion over the previous year compared with the rise from \$20 billion to \$40 billion from the 1951 to 1952 fiscal years. In his October 1952 report, the Director of the Defense Mobilization pointed out the causes for this trend:

The rise in total production will be gradual because it will be selective. Each item in the military program has its own productive curve—a period of acceleration, a period of level sustained production, and a period of decline prior to terminating production. * * * or a large proportion of the items in the program, the sustaining rate has been reached.¹⁰²

Revenues reached a high of \$64.8 billion in the fiscal year 1953, reflecting the full impact of the higher Korean rates. Nevertheless, the Federal Government had a cash deficit for the first time since the beginning of the Korean fighting. This resulted from the fact that the primary impact of the Korean program on government expenditures was being experienced at the time.

DECLINE IN ECONOMIC ACTIVITY: FISCAL YEAR 1954

Reductions in inventory accumulation and in defense outlays in the fiscal year 1954 resulted in the first significant quarterly declines in GNP since 1949. The reductions in new obligational authority and obligations that occurred in 1953 were translated into reduced Federal expenditures in 1954.

The slackening rate of military production was apparent in the decline of deliveries for security programs and, hence, expenditures, in every quarter of the fiscal year 1954. Total deliveries declined by approximately \$7 billion at annual rates from the last quarter of fiscal 1953 to the last quarter of the 1954 fiscal year.¹⁰³

The decline in obligations incurred by the Defense Department, which began in the previous fiscal year, continued through the first half of fiscal 1954. The obligation rate stayed at a low level for the rest of the year. Some military contracts were canceled after the Korean truce, which was signed in July, 1953, the beginning of the

¹⁰⁰ "1953 Statistical Supplement," *op. cit.*, pp. 26-27.

¹⁰¹ *Budget of the United States Government for the Fiscal Year Ending June 30, 1953*, Washington, Government Printing Office, 1952, p. M6.

¹⁰² U.S. Director of Defense Mobilization, *Eighth Quarterly Report to the President*, Washington, Government Printing Office, January 1, 1953, p. 10.

¹⁰³ "Treasury Financing in Fiscal 1954," *Monthly Review of the Federal Reserve Bank of New York*, August 1954, p. 108.

fiscal period. Obligations for hard goods procurement averaged \$500 million a quarter for the first 9 months of the year, compared to expenditures on these programs at the rate of \$4.2 billion a quarter.

Reductions in Federal tax rates, continued operation of the "automatic stabilizers," increases in State and local outlays, and high levels of business investment all served to cushion the decline. At the year's end, there were indications that the downturn would be a limited one. Continued low levels of new obligational authority and obligations, however, presaged no significant rise in Federal spending in the near-term future, barring an abrupt shift in the international situation.

By June 1954, the economy had generally adjusted to the impact of the military and economic mobilization program that the Nation had embarked upon 4 years previously. The Korean cycle had to a large extent worked itself out. From a comparatively "normal" position in the 1950 fiscal year, the economy had been in an expansive stage in 1951 and 1952. After reaching peak levels in 1953, economic activity declined in fiscal year 1954. Toward the end of 1954, there were indications that the bottom of the recession had been reached and an optimistic mood prevailed in business and government circles generally.

SUMMARY

Table 14 shows the relationships of the major phases of the Federal spending process to the overall trend in the American economy during the Korean mobilization period. It should be noted that the primary volatile component of all of the measures of Government activity was the national defense program.

TABLE 14.—*Relationship of measures of Federal spending to changes in economic activity*

[Percent changes from previous period]

Fiscal year	GNP	New obligational authority	Obligations incurred	Budget expenditures
1951.....	+19	+68	+92	+11
1952.....	+18	+10	+25	+15
1953.....	+4	-12	-6	+14
1954.....	+1	-24	-23	-9

Source: Table 12; Survey of Current Business, "1954 National Income Supplement," pp. 222-223; July 1956, pp. 26-27.

As can be seen, the large, initial increases in new obligational authority and in obligations were accompanied by a sharp rise in GNP, but there was a much smaller change in the government expenditure level at that time. In the absence of any other important developments, the rapid expansion in economic activity was based largely on anticipations arising from the early stages of the new government spending program.

As the expansions in new obligational authority and in obligations incurred slowed down, a similar reaction occurred in GNP. On the other hand, the expenditure rate accelerated somewhat akin to the increases in the other series during the earlier period.

Economic activity, as measured by GNP and other indicators, reached a peak in the third year of the Korean mobilization program,

although the rate of increase was slower than during the earlier periods. Actual decreases were recorded in the annual totals of new obligational authority and obligations. Expenditures reached their peak during this period, although they were rising at a reduced rate.

GNP and other indicators of economic activity were declining through most of the fourth year of the Korean mobilization program. However, the annual total of GNP was approximately the same as that of the previous year, indicating that GNP fell in the fiscal year 1954 at about the same rate as it was rising during 1953. Heavy declines in new obligational authority and in obligations were recorded at this time, together with a slight reduction in Federal expenditures.

Several interesting points emerged from this examination of the Korean mobilization program:

1. The major expansion in economic activity occurred at approximately the same time as the announcement and authorization of the program, and while many of the defense orders were being placed.

2. The expansion in economic activity slowed down at about the same time that the rise in new obligational authority slowed down.

3. The declines in new obligational authority and in obligations occurred prior to the declines in economic activity and in government spending.

4. The major rise in government expenditures occurred after the major expansion in new obligational authority and after substantial defense ordering had taken place.

5. The major expansion in economic activity occurred prior to the major rise in government expenditures.

The reader should be cautioned against generalizing simply on the basis of the Korean experience. The events during the Korean mobilization period did show that the main expansive effect of this new program of purchases of privately produced goods and services occurred at the early stages of the spending process rather than at the terminal stages when the government disbursements are made.

A number of situations have occurred where the responses to a new governmental spending program are quite different than was the case during the Korean mobilization program. The Government's embarking on a new spending program could have, as during the 1930's, a negative effect on business confidence. Also, the level of economic activity might have risen instead of declining when the tempo of military spending was slowed. This was the response during the reconversion following World War II.

The unavailability of resources would have prevented the rapid translation of government contracts into business investment in expanded capacity and production on government account. Finally, different types of government spending programs—such as transfer or interest payments—may have had a more subdued effect on the economy generally.

The following special factors contributed to the exact timing and extent of the economic effects of the Korean mobilization program:

1. The American participation in the conflict and the initial defeats, which engendered the fears of a World War III.

2. The recent experience of a global war, with the attendant inflation and shortages of materials.

3. The partial rather than total mobilization of the economy, so that there was generally an ample supply of civilian goods and services.

4. The strong financial position of American consumers and businessmen so that they could make effective the resultant demands.

5. The excess capacity in the economy, so that much of the military demands could be added to rather than supplant civilian demands.

6. The slowing of the tempo of hostilities and, subsequently, the signing of an armistice, so that declines in military production were made possible.

7. The fact that nondefense government programs were not sharply increased when the declines occurred in military spending.

8. The lack of understanding of the timing of the economic effects of the mobilization, so that while experiencing the peak effects of the program the public (if not the Government, too) believed that the worst was yet to come.

EVALUATION AND CONCLUSION

In general, the application of this study for purposes of economic analysis and governmental administration are twofold: (1) a proper understanding of the operation of the Federal spending process is important in analyzing economic developments and government activity during periods of fluctuations in government purchasing, and (2) the measures of the early stages of the spending process are lead series which often quickly register changes in governmental demand and indicate future trends in actual governmental disbursements.

ANALYSIS OF ECONOMIC CONDITIONS

Because the early stages of the government spending process often show up in the private sector rather than in the public sector, it is a temptation, during periods characterized by sharp increases in government purchasing, to conclude that private rather than government demand is contributing the inflationary pressures. The following is an example of this shortcoming which often mars otherwise cogent analyses. The author is discussing the first year of the Korean mobilization program.

This great increase in private demand took place at a time when the federal budget was running at a surplus, and when the direct increase in expenditure for security programs was quite small. Thus most of the inflation in the year after Korea can be said to have been caused by the large volume of private spending * * * *The important point is that Federal fiscal policy cannot be held directly responsible for the inflation* * * * A major part of the remedy must be found in more effective monetary policy to curb private credit spending through curtailing money and credit creation.¹⁰⁴

It is not meant to single out the author of the above statement, because similar analyses were made by A. J. Brown and others.¹⁰⁵

Maintaining that Federal fiscal policy was not inflationary during a year when the rate of military orders was doubled and only a comparatively minor tax increase was enacted ignores the operations of the Federal spending process. To go on and state that the remedy

¹⁰⁴ W. Glenn Campbell and others, *Economics of Mobilization and War*, Homewood, Ill., Richard D. Irwin, 1952, p. 75.

¹⁰⁵ A. J. Brown, *The Great Inflation: 1939-1961*, London, Oxford University Press, 1955; U.S. Congress, Joint Committee on the Economic Report, *National Defense and the Economic Outlook for the Fiscal year 1963*, Washington, Government Printing Office, 1952.

simply exists in curbing private spending and credit creation ignores the very reason for a good share (the nonspeculative share) of the expansions in economic activity. It was government policy of the time to encourage private spending for and financing of the production on government account and the necessary supporting investment.¹⁰⁶ General credit curtailment might have seriously interfered with the needed expansion in private production and investment. To be sure, the inflationary effects of consumer and business spending not directly related to the defense production program should not be ignored, nor need the pegging of the government bond market be defended.

An understanding of the operation of the Federal spending process can be useful in business cycle analysis, interpretation of current economic conditions, and evaluation of future economic developments, especially where changes in governmental activities play a dominant role in the period being covered.

In a more specific way, lead series on the government spending process can be used in a way similar to the lead series which have been developed for private economic activity. The lead series in the Federal spending process are new obligational authority and obligations incurred while series on expenditures are lagging, or at best, coincident measures. There is an intimate functional relationship between these series:

Expenditures are merely the inevitable result of incurring obligations in the form of contracts and other commitments which are based on the appropriations and other authorizations granted by the Congress.¹⁰⁷

This relationship seems quite clearly to meet the test of lags in economic developments—when certain developments are related to other developments as cause and effect, but the effect follows the cause with some time delay. Thus, the lead series are a form of “exceptional” statistics. Their similarity in use to statistics on business plant and equipment expectations can be seen in a study of the latter field by a group headed by George Terborgh:

The importance of measuring plans and expectations, as distinguished from expenditures themselves, arises from the lead time involved. Capital goods have a long production cycle, especially buildings and structures * * * Here the lag of actual expenditures behind the commitments to undertake the project * * * must average several months * * * It follows that figures on expenditures run far behind the flow of commitments.¹⁰⁸

This similarity between “expectational” statistics on private and government spending can also be seen in an analysis of the uses of the series on private new orders:

* * * changes in new orders reflect directly or indirectly fluctuations in demand from producers and consumers. Long before a change in business activity, new orders will reflect the changed demands and will point to coming developments.¹⁰⁹

The lead series on government spending may be of special value in forecasting the general levels of economic activity at times when

¹⁰⁶ Cf. Director of Defense Mobilization, *First Quarterly Report to the President*, Washington, Government Printing Office, 1951, p. 5.

¹⁰⁷ A statement by “a representative” of the Bureau of the Budget U.S. House of Representatives, Committee on Government Operations, *Limitation of Federal Expenditures, Report to Accompany H.R. 2*, Washington, Government Printing Office, 1953, p. 3.

¹⁰⁸ Committee on Business Plant and Equipment Expenditure Expectations, *Statistics on Business Plant and Equipment Expenditure Expectations*, Washington, Board of Governors of the Federal Reserve System, 1955, p. 2.

¹⁰⁹ Gilbert and Paradiso, *op. cit.*, p. 43. “In any given business organization, the current and future business prospects are judged on a much broader base than production statistics. Order backlogs, incoming orders, and market opportunities which will produce a continuing flow of such orders receive much attention; the company's own production figures are given scant attention.” Herbert V. Prochnow, editor, *Determining the Business Outlook*, New York, Harper & Bros. 1954, pp. 152-153.

changes in governmental spending patterns are the decisive factors in the economy. Gerhard Colm, who has prepared many studies and forecasts of economic conditions, has pointed out that economic forecasting is safest to the extent that it can be based on decisions which have already been made and that studies of "what is in store" in the government sector can be among the most important building blocks for constructing an economic forecast.¹¹⁰

Series on new obligational authority and obligations incurred might well be added to the "leading" series of statistical indicators used by the National Bureau of Economic Research. It has been pointed out that the existing National Bureau series, limited to measures of the private sector, can be misleading when the important developments in the economy are in the government sector. Lempert has demonstrated that the National Bureau's lead series indicated a slowing in the rate of economic activity throughout the calendar year 1950, despite the tremendous expansive influence of the Korean mobilization during the second half of the year.¹¹¹

The obligation series may also be helpful in preparing interindustry models where obligations for long leadtime programs are taken into account in the calculation of the "bills of goods" for consumer expenditures, private producers' durables, and business inventories.¹¹²

FORMULATING AND EVALUATING GOVERNMENTAL ECONOMIC POLICIES

Attention to the early phases of the government spending process can be useful in formulating public policy by indicating the initial effects on the economy of governmental action and where that action would lead over time. Kenneth Roose, in his analysis of the 1937-38 cycle, claimed that because such knowledge was not available most policy makers and economists were not aware that the net effect of governmental action throughout 1937 was deflationary.

Roose points out that "Thus there must be a continual awareness of the extent to which the government is acting in its role of tax collector and public disburser to depress or to stimulate the level of income and production."¹¹³

Expenditure policy. The knowledge of the lags in and the nature of the government spending process is of particular importance in gauging a proposed spending program for countercyclical purposes. For example, if a \$5 billion decline in GNP (annual rate) has been experienced in period 1 and a \$10 billion decline is being assumed in period 2, it may be of little avail (aside from effects on expectations) in countering the immediate recessionary tendencies to embark upon a large construction program for which contracts could not be let until period 3 and production gotten underway until period 4. In such case, recourse to actions which involve shorter "leadtime" may be more appropriate. A step up could be ordered in the rate of production of equipment previously contracted for. With programs of military defense, foreign aid, stockpiling, and atomic development

¹¹⁰ Gerhard Colm, *The Economic Outlook for 1955*, abstract of an address before the Conference on the Economic Outlook, University of Michigan, Ann Arbor, Nov. 12, 1954, p. 2.

¹¹¹ Leonard H. Lempert, "Current Implications of the 21 Statistical Indicators," *Illinois Business Review*, December 1956, p. 6.

¹¹² Irving H. Licht, "Government" (in conference on Research in Income and Wealth, *Input-Output Analysis, Technical Supplement*, New York, National Bureau of Economic Research, 1954), p. 2-13.

¹¹³ Kenneth D. Roose, *The Economics of Recession and Revival, an Interpretation of 1937-1938*, New Haven, Yale University Press, 1954, p. 257.

totaling many tens of billions of dollars a year, an actual acceleration of \$2½ billion in a quarter (\$10 billion at an annual rate) in deliveries might be more effective.

The literature seems to have emphasized almost exclusively possibilities of embarking on new programs to the neglect of the ready possibilities of altering the obligation, production, and delivery rates on existing programs.

In these latter instances, there are not the problems of getting advance Congressional authorizations and appropriations such as occur in the traditional anticyclical program—new public works. Moreover, the danger of overcompensating is not as great. Particularly if the economy were heading up again as the combined result of monetary and other government action, a slowdown could then be instituted in the obligation, production, and delivery rates to keep the activity within the overall level programed for the year or longer period involved. The apportionment, reserve, and allotment techniques described in chapter II could be utilized in this connection.

An example of the administrative stepup in government spending to counter deflationary tendencies occurred in the third quarter of 1954. Secretary of Commerce Weeks announced a policy of speeding up government purchasing within the limits of the budget to give "the economy a little nudge." He cited the distribution of highway grants to the States 6 months earlier than normal, a fast start on procurement of new army uniforms, and a policy of pushing aid to airport construction within the limits of the funds appropriated by the Congress.¹¹⁴

No study has yet been made of the effectiveness of the 1954 speedup, nor could one be adequately made without access to the procurement plans and records of the major spending agencies. Some insight may be obtained from a similar experience in the 1937-38 recession. In November 1937, the President requested the various government agencies to accelerate procurement orders wherever possible so that government demand might serve as a partial offset to the then current sharp decline in private demand. A study of this period concluded:

Existing records are not definitive, but it does not appear that the President's request resulted in any considerable volume of advance procurement.¹¹⁵

A number of explanations were offered: (1) inadequate information as to current purchases and future requirements, especially among departments with decentralized procurement systems; (2) insufficient funds to make large advance purchases, particularly in the case of agencies which were uncertain as to whether they would obtain deficiency appropriations; (3) insufficient storage space; (4) administrative difficulties on the part of purchasing officers in concentrating the year's work; and (5) contractual obligations already entered into, particularly on construction projects calling for delivery throughout the remainder of the fiscal year.¹¹⁶

A more recent study of the attempted administrative speed up in government procurement in 1958 yielded similarly disappointing results and somewhat similar explanations. Long-term commitments, lack of storage space, and insufficient time were listed as reasons for

¹¹⁴ "Weeks Outlines U.S. Policy to Boost Economy, Speed in Spending Planned to Bring Upswing," *Philadelphia Inquirer*, July 30, 1954, p. 2.

¹¹⁵ Linnenberg and Barbour, *op. cit.*, p. 118.

¹¹⁶ *Ibid.*, p. 119.

the inability to achieve a significant speed up in procurement to combat the recessionary conditions in 1958.¹¹⁷

The Bureau of the Budget concluded that the governmental actions that have the largest and promptest economic impact are transfer payments such as unemployment compensation that constitute outright additions to private purchasing power, rather than programs tied to construction or the production of goods.¹¹⁸

Tax Policy. Understanding the time sequences in the Federal spending process is also important in formulating tax policy. The administration leaders were in a difficult position in the fiscal year 1951. The inflationary pressures that had been rampant in the economy since the Korean outbreak were unaccompanied by any immediate Federal deficit. Under the principles of "sound finance" and balancing of receipts and expenditures, there was no need for added taxation during the year. However, the administration was partially successful in coupling the need for increased revenue with recently enacted appropriations and the high levels of procurement—rather than with the low contemporaneous level of expenditures. This resulted in sufficient additional revenues to yield a surplus in 1951, although not in the later years when the high projected expenditures materialized.

The following statement made by the then Secretary of the Treasury John Snyder to the House Ways and Means Committee clearly illustrates the importance for fiscal policy of taking account of the economic impact of the early stages of the Federal spending process.

In considering the additional revenue required, we should not be misled by the fact that, temporarily, the budget deficit is moderate. Since an important part of defense preparation entails production operations extending over two, three, or even more years it is inevitable that obligations incurred now will be fully reflected in expenditures only at some time in the future. * * *

Under present conditions, expenditures for defense exert an inflationary pressure on the economy substantially in advance of the actual disbursement of funds. Demands for materials, labor, and capital outlays occur very soon after the Government contracts are let, well in advance of the time when the Government pays for that production. This explains in part why scarcities and inflationary pressures have developed even though a large portion of the increased defense funds appropriated by the Congress after Korea have not yet been reflected in Government expenditures.¹¹⁹

A comparable policy might be adopted toward tax reduction when a decline in government purchasing occurs. In fact, such action took place after the hump in the Korean mobilization program had been passed. The sizable decline in obligations which occurred in the fiscal year 1954 was accompanied by reductions in individual income taxes, by the elimination of the excess profits tax on corporation income, and by other modifications in the tax structure which resulted in immediate losses in revenue. These tax reductions may not have been directly motivated by the concurrent declines in government orders. However, the administration policy at the time was to reduce government demands, both on output and income, so as to allow increased private demand and personal disposable income.

Direct controls. The inflationary (or deflationary) effects of changes in the early phases of the Federal spending process are of importance in the administration of price, wage, and materials controls. Anshen

¹¹⁷ U.S. Bureau of the Budget, *Federal Fiscal Behavior During the Recession of 1957-58*, Washington, 1961, p. 18.

¹¹⁸ *Ibid.*, p. 21.

¹¹⁹ U.S. Secretary of the Treasury, *Annual Report on the State of the Finances for the Fiscal Year Ended June 30, 1951*, Washington, 1952, p. 406.

and Wormuth, in their discussion of World War II controls, conclude that, because of the failure to properly take into account the leadtime factors in Federal procurement, controls are likely to be applied later than an "objective and imaginative analysis" of the facts would dictate. Also, these controls are likely to be more limited in scope than is required to deal promptly and effectively with the necessary adjustment of the economy's resources. They point out that the economic setting increased the natural disposition to ignore the lag between the making of defense production plans and the actual output of munitions and related items at mass production levels.¹²⁰

Although beyond the general scope of this study, it would appear that the general phenomena of inflation and deflation need to be explored, not only in terms of the two poles of psychological expectations and actual cash flows, but also the intermediary stages during which plans are formulated and decisions are made.¹²¹ What may appear to be actions based merely on anticipations (such as buying sprees in advance of heavy war expenditures) can be really the early stages of the war expenditures themselves—such as necessary tooling up and business inventory accumulation.

ADMINISTRATIVE GOVERNMENTAL USE

The measurements of the early stages of the Federal spending process lend themselves to administrative use in forecasting future levels of expenditures, in gauging the progress made in the execution of Federal programs, and in controlling expenditures.

Forecasting expenditures. Forecasts of government expenditures can be prepared by making assumptions as to the availability of funds (new obligational authority and unused obligational authority granted in prior years), the extent to which they will be committed during the period under study, and expected delivery or expenditure rates resulting therefrom.

Algebraically, the relationship can be described in terms of a difference equation as follows:

$$X(t) = aA(t) + bA(t-1) + cA(t-2) + \dots + nA(t-n),$$

where

$X(t)$ = expenditures for a given year (from current as well as prior year appropriations).

$A(t)$ = appropriations and other new obligational authority granted for a given year.

$A(t-1)$ = appropriations for the previous year, etc.

a = the proportion of appropriations for year (t) to be spent in year (t).

b = proportion of appropriations for year ($t-1$) to be spent in year (t), etc.

As the Government prepares estimates of appropriations for future periods, the major question involved is the extent to which the lead time coefficients— a , b , c , . . . n —remain constant over a period of time. Unfortunately, lead times vary for different types of programs and under different economic conditions. Hence, in the absence of a general degree of stability in government spending patterns, expenditures in a future period cannot be predicted simply by examining the total of new obligational authority.

¹²⁰ Anshen and Wormuth, *op. cit.*, p. 526.

¹²¹ Cf. Brown, *op. cit.*, " . . . the expenditure approach to the phenomena of inflation, so enlightening in most circumstances, turns out to be sadly inadequate during the period under review" (p. 71).

Leadtimes will vary as the product mix of governmental purchasing fluctuates with changing needs and conditions. Studies of inter-industry economics have revealed that even technological leadtimes in specific industries are not invariant over time or with respect to changes in the level of activity. More distant sources of materials, the employment of less efficient labor, and variations in the precise nature or quality of the product may tend to increase the leadtimes.¹²²

Egle states that the so-called output lag is relevant in this connection (the lag of output behind a change in the volume of orders). He concludes that, for purposes of fiscal policy, this output lag will probably always defy reliable measurement because of the problem of determining the length of the lag with variable governmental outlays in goods.¹²³

The Navy Department has found that, in recent years, expenditure rates for the major categories of long-range procurement have many characteristics of the normal growth pattern—the logistics or S curve. By knowing or estimating the availability of funds for a given program and the expenditure rates experienced on similar programs in recent years, expenditure forecasts can be made for the next several years.¹²⁴

The rationale for the S curve is that production on long lead-time items is slow in getting started, then hits its stride with quantity production, and finally tapers off as the order nears completion. Such a method is more useful for procurement categories for which there is experience, rather than for such new items as missiles and space vehicles.

In a more general way, changes in the level of new authorizations and/or new commitments can be used to gauge the future course of expenditures in a somewhat similar manner that fluctuations in new orders are used by business analysts to estimate future sales trends. This is brought out in the following discussion of private orders.

When new orders have been received for several months at a rate exceeding sales, the indications are strong that sales will rise in the future. If, on the other hand, new business has been running below sales, a downward sales trend is indicated, except when backlogs are unusually high in relation to sales. Of course, in this case also sales must ultimately drop unless demand is stimulated, but with many months of unfilled orders on hand, a cut in output can be deferred for a considerable period. Finally, when incoming orders are about in line with sales and backlogs are normal, it is likely that sales will not be altered much for several months.¹²⁵

Similarly, when the current level of new obligational authority and/or obligations incurred exceeds the level of expenditures the indications are strong that expenditures will rise in the future and that if the lead series are lower than the level of payments, future expenditures will be lower. Unexpended balances play a role analogous to that of unfilled orders, because even during a cutback in new

¹²² Leadtime in input-output analysis covers only the time necessary to transform the input of an industry to an output. Leadtime in government spending refers to the entire period from ordering an object to delivery and payment. Jean Bronfenbrenner, *Lead Times in Interindustry Models: Concepts and Computations*, Washington, Department of Commerce, 1952, p. 3.

¹²³ Walter P. Egle, *Economic Stabilization: Objectives, Rules and Mechanisms*, Princeton, Princeton University Press, 1952, p. 193.

¹²⁴ For example, about 85 percent of the funds available for naval aircraft procurement in any one year will be spent over the next five years. U.S. Department of the Navy, *Statistical Approach to Forecasting Expenditures*, NAVEXOS P-1571, undated, pp. 2-3.

¹²⁵ Jacobs and Wimsatt, *op. cit.*, p. 20. "When a change in the trend of defense expenditures takes place, it nearly always results from a prior change in the same direction in appropriations and contracts. As was to be expected after the outbreak of the Korean conflict, appropriations and contract-letting initially expanded more rapidly than expenditures." Federal Reserve Bank of New York, *Selected Economic Indicators*, 1954, pp. 72-73.

authorizations and new commitments; it is possible for expenditures to hold steady or even rise if they are made out of preexisting balances.

Evaluating progress. It is the belief of the writer that the failure to aggregate the current information on obligations is an important shortcoming of the budgetary process. It is an indication of the concentration on the minutia of detailed accounting rather than on the major trends and developments. Current reports on total government obligations incurred during a given period and amounts of outstanding obligations at the end of a period would provide a valuable indicator of the total progress being made on government programs.

The aggregation and publication of the detailed obligation data could also have an important "feedback" effect on the reliability of the data supplied for internal budgetary control purposes. Comparisons and analyses of the data supplied by the various agencies should reveal, to a greater extent than is possible under current procedures, any inconsistencies in interpreting what is an obligation or in reporting the status of the various kinds of accounts. Moreover, the requirement of publication ought to have a favorable effect on the quality of data presented as, hitherto, agency officials have known that the information they reported would not be made public.

Controlling expenditures: Many groups, private as well as governmental, have wrestled with the problem of how to control Federal spending effectively, with the particular view of reducing it. Unfortunately, most of the discussion has centered on expenditures *per se*. For example, the second Hoover Commission has urged emphasizing costs rather than obligations in order to better control government spending.¹²⁶ Expenditures are merely the completion of the spending process. If adequate controls are to be exercised over government spending, attention must be given to the early stages where expenditures are authorized and committed, rather than merely to the payments for goods and services already ordered and produced.

In a more general and philosophical discussion of what he terms "the structure of commitments," John Norton describes the perennial dilemma of the "budget cutter":

Some past commitments project into, and limit, the present and future; of these some are irrevocable but others may be modified at a cost. Today's events are almost completely predetermined by choices made yesterday and before; nevertheless, a small area of free choice remains. As of any day, the opportunity, for the exercise of free choice increases as we include more and more of the future within the compass of our decision making.¹²⁷

An improved understanding of the operations of the Federal spending process on the part of those interested in curtailing government spending is necessary for the preparation of effective proposals to change the course of government spending. Mere exhortation, however well-intended, to reduce expenditures in a given year, may prove fruitless. Naive exponents of economy tend to be quickly dismissed by members of the Congress if they show themselves ignorant of governmental budget matters.

CONCLUDING REMARKS

It is a fundamental finding of this study that the variations in timing and impact of the various stages of the governmental spending

¹²⁶ U.S. Commission on Organization of the Executive Branch of the Government, *Budget and Accounting*, Washington, Government Printing Office, 1955, pp. 17-25.

¹²⁷ John D. Norton, "Research Required for the Application of Interindustry Economics" (in Conference on Research in Income of Wealth, vol. 18, Princeton, Princeton University Press, 1955), p. 210.

process necessitate taking measurements of the governmental spending stream at earlier phases than merely at the completion stage represented by deliveries or payments.

It may well be that different kinds of measures are needed at different periods in the development of government programs and for various types of governmental programs.

When the Government is about to embark upon a new program, often the most useful indicator of the scope of this new activity will be the amount appropriated for it by the Congress. A series on new obligational authority would furnish the needed information in this case and would furnish also some insight to any "announcement" effects.

A more direct indication of the current effect on the economy can be the aggregate of the orders placed and contracts let. A series on Federal obligations incurred would provide the necessary information in this instance and, in general, the most convenient measure of the progress being made on a government program.

Changes in the size of government programs often show up in the new obligational authority and obligations incurred series significantly earlier than in the expenditure series. This is especially the case where a long production period is involved between the time commodities are ordered by the Government and the time they are produced. Moreover, such production typically takes place in the private sector of the economy and only appears in the public sector when the delivery and payments are made. Hence, the two "lead" series on governmental spending would, in these instances, help to indicate the extent to which developments in the private sector arose in response to changes in the public sector and were mainly part of the governmental procurement process.

Where the increase in government activity consists mainly of payments made directly to the public, such as veterans' pensions or relief, a series on expenditures would be of particular value. Except for a comparatively minor amount of advance and progress payments usually made to contractors on large production or construction orders, the expenditure of public money represents the completion of the program concerned rather than the dynamic period of its development.

The use of any of these measures need not be mutually exclusive and their contribution may be additive. What is needed is not a single standard measure of Federal spending but a tool kit of series, each of which is adapted to special analytical purposes. The addition of economic series measuring the early stages of the Federal spending process to the conventional series which emphasize the terminal stages may help better to meet the needs of the various situations that can occur.

This specific recommendations that arise from this study are that series on new obligational authority granted by the Congress and obligations incurred by government agencies be computed regularly by the Federal Government and that they should be published in the standard compendia of economic statistics. They should be supplemented from time to time by reports on unobligated balances and on unpaid commitments outstanding.

Such series would be useful and complementary additions to the sections on government finance in such publications as the *Treasury Bulletin*, the *Economic Indicators*, the *Federal Reserve Bulletin*, and the *Survey of Current Business*. Subsequent efforts might be made to explore the value of such series for state and local governments and the possibilities of their preparation.

Likewise, a better understanding of the workings of the Federal spending process will assist in the use of these tools for purposes of economic analysis and policy formulation. It is hoped that the work done for this study will prove suggestive to others concerned with related questions of fiscal policy to the end that economic analysis will make a more intelligent and knowledgeable contribution in the formulation of governmental economic policy.

EMPLOYMENT IMPACTS OF DEFENSE EXPENDITURES AND OBLIGATIONS

(Reprint from Review of Economics and Statistics)

By EDWARD GREENBERG*

I. INTRODUCTION

The importance of specifying accurately the impacts of military procurement in models of the economy is apparent. One of the potentially most important applications of such models is to generate the responses of the economy to changes in procurement activity and to evaluate the effects of alternative courses of government action designed to reduce the economic hardships associated with large and rapid changes in military procurement. An inaccurate specification of equations describing the impacts of government actions may seriously mislead planners who are devising appropriate offsetting policies. For example, if the major changes in defense employment occur at the order-letting stage, rather than the expenditure or final delivery stage, as several models suggest, necessary modifications in fiscal and monetary policy may be delayed by about a year.

From another point of view the empirical work contained in this paper is an attempt to include instrumental variables, variables which can be directly controlled by policy makers, in models designed to describe the behavior of the economy, as stressed by Orcutt, [15]. It will be pointed out that several of the existing models of the economy do not include the appropriate instrumental variables, making it difficult to consider alternative courses of action. In fact, the whole area of effects of government spending has not been studied extensively.¹

For the purpose of analyzing the employment impacts of military expenditures and obligations, the paper proceeds as follows: (1) A brief review of the process by which a procurement action moves from the budget stage to the delivery and final payments stage is presented. Based on this process, implications are drawn about the appropriate variables to be entered into equations describing the impacts on employment of procurement actions. (2) Several existing models of the economy—those with fairly well-developed government sectors—are examined in the light of (1) to see if they reflect the process accurately. (3) Empirical work is presented which attempts

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¹ The following comments makes the point well: "When we began our work we expected that our main job would be to study very closely the detailed timing relations implicit in already established quantitative measures of the effectiveness of monetary and fiscal policy. We soon realized that no such foundation of established quantitative knowledge existed about (1) the working of the money and credit mechanism or (2) a large portion of the mechanism through which fiscal policy works. We found ourselves in the trying position of searching for a needle in a haystack, when no evidence had ever been produced that the haystack contained a needle in the first place" [1, p. 1].

to estimate the employment impacts of the process in two important defense industries. A concluding section summarizes the paper and points out some important data and research needs.

II. THE MILITARY PROCUREMENT PROCESS AND SOME IMPLICATIONS

The discussion which follows briefly reviews the military procurement process and indicates the implications of this process for empirical research designed to estimate the economic effects of procurement actions.²

The process normally begins with the submission of the President's budget in January, on which congressional hearings are held. Later in the year, appropriations bills are passed, providing the Department of Defense with authority to spend. During the year the Defense Department incurs obligations. In the case of procurement, these are generally in the form of contracts with private industry. To complete the process, expenditures are made as the finished products are delivered.

Which stages in the procurement process are crucial for measuring impacts on output or employment? Subject to several qualifications discussed below it appears that the contract-letting, or obligations, stage is most significant. At this stage, the contractor adjusts employment and output as he takes steps to fill the order. As production is undertaken, inventories are increased. This is reflected in GNP.³ Eventually, the product is completed and payment is received by the firm. An important implication of this description, for the case in which production and delivery requires rather a long time, is that the employment and income effects are felt prior to the expenditure—in some cases many months prior.

As indications that these leadtimes are significant, it might be noted that 27.8 percent of the 1960 total of procurement and research, development, test, and evaluation was negotiated in the category: "Technical or specialized supplier requiring substantial initial investment or extended period of preparation for manufacture" [20, p. 23]. Other evidence is reported by Weidenbaum [23, p. 11], who points out that the lag between ordering and production for rifles, destroyers, transport planes, bombers, and jet planes is two or more years. Empirical work of Ando and Brown [2] supports the view that obligations affect output. Their contribution will be discussed more fully below.

Several additional features of the defense industry and the procurement process complicate the above description. First, defense firms often submit proposals to the Defense Department describing projects which might be of interest to the Department. While a certain amount of this type of work is likely to be going on all the time, greater activity may take place in response to information from the Department of Defense regarding its view on national security needs. Information is made available to the defense industries in various ways,

² More detailed analysis of this process may be found in [5], [10], [16], [22], and [23].

³ Conceptually, for national income accounting purposes, work in progress, on which progress payments have or have not been paid, should be included in inventories. Unfortunately, company accounting practices make it difficult for the national income accountants to do this since funds expended on such inventories are often reflected in accounts receivable, rather than in inventories. On the government side of the accounting, however, the amount called "government purchases of goods and services" is on a delivery basis. Progress payments paid during production do not appear as purchases until final delivery is made, at which time the total expended on the contract is recorded as purchases. The foregoing refers to equipment contracts; construction contracts are treated somewhat differently.

including speeches by officials of the Department and amounts requested in the Budget message. Though the former source of information is fairly difficult to quantify, the budget is readily available. Also, to the extent that the Department has unobligated appropriations in various accounts, information on the possibility of future obligations is passed on to the industry. Second, if off-the-shelf items are supplied, the effect of the government orders depends on firms' inventory policies and positions. If they were overstocked, for example, there may be few effects on employment and output until inventories are further reduced. In specialized defense firms this is probably not very important. Third, in many contracts the typical procedure is for the firm to bill the government as production takes place. These progress payments are made although no delivery takes place. In the past several years changes in progress payments have occurred which are of some importance. The percentage of costs paid monthly has been changed from 100 to 80 percent and then back to 100 percent. Peck and Scherer suggest that the ability of defense firms to operate is affected by their access to working capital, so that amounts received from the government might have an independent effect [16, p. 162-163]. Fourth, it is likely that firms do not respond completely to new contracts on a month to month basis, due perhaps to the high costs of rapid employment change.

These considerations suggest that a model designed to predict the impacts of changes in government procurement actions on employment should include among the independent variables:

(1) "Announcement" effects—specifically, budget plans and unobligated appropriations. The budget variable is equal to the budget amount from January until the month in which the appropriations bill is passed, after which, it is equal to zero until the following January. This formulation is intended to reflect the hypothesis that budget plans are the main source of information from January until the appropriation bill is passed. Unobligated appropriations constitute a backlog item, consisting of the balance in the appropriation account after currently incurred obligations are deducted and new appropriations are added. At any point in time, these unobligated balances of appropriations represent the amount available to make additional contract awards.

(2) Expenditures—to allow for the importance of working capital.

(3) Obligations—to measure the direct impact of contract letting. Several lags will be incorporated to capture the possibility that firms do not respond fully on a month-to-month basis.

Additional variables are needed to capture the effects of two other factors: price changes and changes in the amount of subcontracting. Since the empirical work will relate money amounts of expenditures and obligations to employment, changes in the price level will weaken the relationship. In a period of rising prices, for example, the same amount of obligations would lead to a smaller amount of employment.

Changes in the amount of subcontracting are important because the Department of Defense budget categories and the SIC employment categories do not cover the same industries. This problem is described more fully in the appendix. Briefly, Department of Defense budget categories are concerned with end items, such as aircraft or ships, while the SIC data are keyed to the major product class of individual establishments. The tendency for more electronics equipment to be included in ships is reflected in the Department of Defense data in the "ships" account, while in the employment data, it is reflected in the electronics category. This factor should operate negatively on employment, that is, a given amount of dollars obligated for ships will

lead to less employment in shipbuilding establishments, the more electronic equipment is included in the ship.⁴ An attempt is made to allow for these effects by including another variable:

(4) Polynomial in time—to allow for trends in subcontracting and price changes. The use of a trend variable will, of course, pick up other smoothly changing omitted variables. In the present study, changes in the amount of procurement purchased from foreign sources may be one such variable.

Finally, although I suspect that much of the seasonal variation in the monthly employment series is due to the seasonality in the obligations series, conventional holiday periods and climatic conditions may be significant. These are allowed for by a set of variables:

(5) Set of seasonal dummy variables, with January omitted.

Employment will be measured by (1) total number of workers, (2) number production workers, and (3) number of production workers times average weekly hours worked. These all reflect different types of adjustments. It is anticipated that the man-hours variable will be most sensitive to changes in obligations, since adjusting the length of the work week is generally the fastest way to increase output. The number of production workers should be more sensitive to obligations than total workers, since the latter includes a large component of managerial and research people, who may be more insulated from changes in production. To the extent, however, that research personnel are involved, the "announcement" variables may exert a greater impact on total workers than on production workers.

III. REVIEW OF PREVIOUS EMPIRICAL WORK

The discussion of the previous section leads to the conclusion that the structure of the government procurement process is such that the primary effects on employment and output will be felt some time after the order or obligations stage, with secondary effects operating through expenditures and announcements. With that in mind, some empirical work in which government purchases of goods plays an important role will be examined. This work includes four large scale models of the economy and two papers which emphasize the importance of obligations.⁵

Two other models were examined, but will not be reported upon in detail since their government sectors are not greatly elaborated. These include the Wharton School Quarterly Economic Model [Klein, 8], and T. C. Liu's Quarterly Model [11]. In the Klein model, government purchases appear only in the identity for GNP. Other possible routes through which defense procurement could flow are through new orders and unfilled orders. New orders, however, are a function of recent sales and price changes, which do not explicitly allow for a change in government procurement action. New orders, along with the rate of capacity operations, determine unfilled orders. Again, there is little scope for changes in defense spending.

⁴ The effects of price changes and changes in subcontracting are discussed by Hitch in [7, p. 694].

⁵ Several other large-scale models of the economy are currently being constructed. The Brookings-Social Science Research Council model, [9], is close to completion, although important revisions are still being undertaken at this time. Two others, Wisconsin's Social Systems Research Institute [14] and the National Planning Association's Program Analysis for Resource Management, [13] have not, to my knowledge, elaborated a government expenditures sector.

In Liu's model, the relevant variable, government purchases of goods and services, appears (after eliminating an identity) in the equation determining the change in nonfarm business inventories. Its coefficient is positive, but not significant. The description of the government spending process suggests that the coefficients should be negative, since purchases would tend to decrease inventories. However, since service items, which may have fairly short lags between order and delivery, are included, and since there are problems in estimating inventories, the relationship may have been obscured.

I next consider four large-scale models and two other studies which are directly concerned with the impacts of the procurement process.

A. UNIVERSITY OF MICHIGAN RESEARCH SEMINAR IN QUANTITATIVE ECONOMICS ECONOMETRIC MODEL

One of the few econometric models to take into account institutional factors of the government procurement process is the model, based on annual data, developed at the University of Michigan [17]. The equation explaining the change in durable goods inventory is a function of the difference between Federal military purchases in the following and the current year, $(\Delta M + 1)$ as well as other variables. $\Delta M + 1$ enters positively and significantly into the equation. The rationale for including this variable is that production of this component of inventory " * * * appears in the national accounts as goods in process, and exerts a strong impact on the economy long before delivery of the finished product materializes as government expenditure" [17, p. 115].

This model is thus seen to have recognized the importance of accurately specifying lead and lag structure. It is, however, inadequate from other viewpoints: (1) The level of aggregation is quite high, making it impossible to obtain impacts on specific industries; (2) the use of annual data makes it impossible to study intra-yearly movements which may be of some interest; and (3) the use of Federal military purchases from private industry includes purchases of items which are not classified in the durable goods industry. Nevertheless, the importance of this variable in the inventory equation is an indication of the gains to be realized from an appropriate specification of the lead and lag structure of the process.

B. DUESENBERY-ECKSTEIN-FROMM: MODEL OF THE U.S. ECONOMY DURING RECESSION

In their very interesting paper [4], Professors Duesenberry, Eckstein, and Fromm recognize the importance of the order effect, particularly in the explanation of inventory changes. In constructing the order series, however, they assume that the lag between orders and purchases is one quarter. They nevertheless are able to state that the " * * * stimulus of government actions worked through orders as much as through actual expenditures." It would be interesting to explore the consequences of a more realistic specification of the lag between obligations and purchases.

C. FROMM: "INVENTORIES, BUSINESS CYCLES; AND STABILIZATION"

In a paper prepared for the Joint Economic Committee, Gary Fromm states, " * * * fluctuations in government orders and expend-

itures coupled with their resulting impact on, and the independent variation of, private business investment appear to be the principal responsibility for recent stability difficulties in the U.S. economy" [6, p. 37].

Although he presents some data to support this view, government orders do not explicitly appear in the econometric model of the economy presented in a later section of the paper. They are included, however, in the change in unfilled orders variable, which enters the inventory change equation. There would appear to be some difficulty, though, since the unfilled orders variable is essentially determined by lagged values of itself and current and lagged final sales of goods. Thus, government orders are present only to the extent that they appear as initial conditions in the unfilled orders equation, and to the extent that they appear in the final sales of goods, which enters with a lag of two periods. The following is the inventory equation:

$$\begin{aligned} \Delta I_t = & -29.4345 + .4601 S_t^g - .7314 I_{t-1} \\ & + .1658 [111.3945 - .3878 S_{t-1}^g \\ & + .5229 \Delta S_{t-2}^g - .5545 O_{t-2} + .8099 O_{t-3}] \end{aligned}$$

where I is inventories, S is final sales of goods, and O is unfilled orders. The term in brackets is the equation for O_{t-1} [6, pp. 71 and 73].

Change in inventories is thus determined by current sales and sales lagged one, two, and three periods. In the case of government purchases, we would expect inventories to be related to sales with a lead, as in the Michigan model.

D. LOVELL: FACTORS DETERMINING MANUFACTURING INVENTORY INVESTMENT

A paper which explicitly considers government obligations is that of Michael Lovell. Using quarterly data from 1954 through 1960, he obtains the following inventory change equation:

$$\begin{aligned} \Delta H_t = & -4.01 - .0683 H_t - .184 X_t + .0298 \\ \Delta X_t = & .0158 \Delta U_t + .0112 U_t - .295 E_t - .124 O_b \end{aligned}$$

where H is inventories of durable goods, X is sales of durable goods, U is unfilled orders, E is defense expenditures, and O_b is defense obligations [12, p. 132]. Defense obligations are seen to enter positively; they are also statistically significant. Unfortunately, Lovell did not report on longer lags.

E. ANDO-BROWN: COMMISSION ON MONEY AND CREDIT STUDY

The study most closely related to the present is the paper by Ando and Brown for the Commission on Money and Credit. They report that "the relationship between expenditures on aircrafts and current output is small. The current and two preceding months of expenditure did have coefficients that were statistically significant, and there may be some evidence that advance payments to contractors are of some significance to aircraft output" [2, p. 144]. The relationship between lagged obligations and output, on a quarterly basis, resulted in the following equation:

$$\begin{aligned} P_t = & .0063 O_t + .0002 O_{t-1} + .0107 O_{t-2} \\ & (.0077) \quad (.0076) \quad (.0068) \\ & + .0130 O_{t-3} \\ & (.0067) \end{aligned}$$

where P_t = quarterly average of Federal Reserve Board Index of Production in period t , and O_t = quarterly obligations in period t (2, p. 144). The second and third quarters preceding that for which output is to be explained were considered significant, so that a lag of nearly a year between obligations and output existed. Further experiments on longer lags were not very satisfactory.

The Ando-Brown paper thus presents important evidence on two of the effects which might be considered important for the discussion of the government spending process and the nature of the defense industries. It is concluded that lagged obligations explain output better than do expenditures, but that recent expenditures have some effect on output, pointing to the possible importance of the industry's dependence on the government for working capital. Their conclusions are summarized in the following statement:

Even variations in rates of procurement of defense items take a considerable period before they register themselves in output. Output appears to be more sensitive to contract awards than to actual expenditure in the aircraft component of defense expenditure, the only one we examined. Aircraft contracts, for example, change output by only 20 percent of the contract by the end of 6 months, 55 percent by the end of three quarters, and are nearly fully reflected in output change by the end of a year. This particular case, however, can be attributed to excess capacity in the industry. New products could be initiated only after lengthy periods of research and would be expected to have lags of considerably greater length [2, p. 11].

The main differences between Ando-Brown and the statistical results to be reported upon in the following section are the following:

(1) The absence of variables representing "announcement" effects in the Ando-Brown paper. These may significantly affect the timing of changes in output and employment.

(2) The use of output rather than employment as the dependent variable. Since the Federal Reserve Board reports [3, p. S-9] that the monthly output series for the aircraft industry is based on man-hours, with an adjustment for output per man-hour in the case of aircraft parts, this particular difference is probably not crucial. I prefer to work with the employment data directly, leaving the polynomial trend to capture changes in output per man-hour, because neither the source nor the quality of the Federal Reserve Board's adjustment is known to me.

(3) The correspondence between Department of Defense budget categories and SIC categories. Ando and Brown relate budget aircraft to SIC aircraft, while the present study, because of the fact that much of the country's missile production takes place in establishments classified as aircraft, attempts to adjust for this.

(4) Ando and Brown work with the period 1954-1959, while the present study incorporates 1955-1963.

G. SUMMARY

The preceding discussion of several large-scale models of the U.S. economy indicated that, by and large, these models do not appear to have portrayed the government sector accurately with respect to purchases of military goods. In general, the equations developed to explain inventories, orders, and unfilled orders are better suited for industries in which sales are made from inventories, and the adjustment mechanism operates through attempts to control inventories.

This is not the case for large amounts of military procurement, however. Many of these items are made to order, and a long lag occurs between orders and purchases. If military procurement were a small or unchanging portion of government purchases, inaccurate equations would perhaps not be crucial. But some of the important uses of these models have to do with the time path of the economy as changes in these procurement actions occur. An accurate description of the process is thus especially necessary if econometric models are to be helpful in evaluating alternative courses of action which would tend to offset major changes in procurement.

The discussion also showed that when obligations were explicitly included they emerged as an important explanatory variable. The empirical work discussed in the following sections bears this out for the aerospace industry expenditures and presents some new evidence on the importance of the "announcement" effect.

IV. STATISTICAL RESULTS

The previous sections have argued that models designed to analyze the effects on employment of military procurement should incorporate announcement variables and new orders to obtain more accurate predictions of the time path of employment. It has also been pointed out that many of the existing large-scale econometric models of the economy have not done so, and that the small amount of empirical work which has recognized the role of new orders has discovered it to be an important variable. In this section empirical work for two groups of budget categories will be discussed. Specifically, expenditures and obligations for the aircraft-missiles-astronautics budget categories (hereafter aerospace group), will be related to employment in SIC categories 372 and 19, aircraft and parts, and ordnance and accessories, respectively, and budget category "ships" will be associated with SIC category 3731, shipbuilding and repairing. A more detailed description of the data may be found in the appendix.

Tables 1, 2, and 3 contain the results for the aerospace industry of multiple regression analyses for three dependent variables: total employment, production worker employment, and number of production workers times average weekly hours worked. Employment figures are in thousands of employees, man-hours are in thousands, and all dollar amounts are in millions. The results are broadly similar and are discussed in the following paragraphs.

(1) Seasonal and time variables: Generally, the seasonal variables are not significant individually, which lends support to the hypothesis that observed seasonality in the employment series is better explained by the seasonality in the obligations series than a constant seasonal pattern. An F test performed on the group of seasonal dummy variables for the total worker regression proved to be insignificant at the 5 percent level. Both time and time squared are highly significant. The coefficient of time is negative and that of time squared, positive. Over the range of t in this study, however, the negative effect predominates and the net effect of time is negative, although at a decreasing rate. In view of the earlier discussion of the likely effects of price changes and subcontracting patterns, this negative effect was expected.

TABLE 1.—*Aerospace Industries—Regression analysis*[Dependent variable: Total workers]¹

Independent variable ²	Coefficient	Standard error	Beta	Partial correlation
Seasonal dummies:				
February.....	0.6556	25.84	0.0031	0.0030
March.....	21.1127	27.28	.1006	.0909
April.....	10.0475	21.25	.0478	.0556
May.....	11.8130	27.41	.0563	.0507
June.....	43.2230	31.50	.2058	.1596
July.....	24.1764	26.11	.1215	.1085
August.....	35.9255	33.91	.1804	.1249
September.....	60.3828	33.88	.3034	.2056
October.....	62.7813	33.69	.3154	.2145
November.....	65.4592	39.51	.3289	.1916
December.....	³ 88.8696	41.55	.4465	.2444
⁴	³ 8.9091	.9671	-4.6461	- .7355
⁴	³ .0459	.0061	2.8220	.6611
Current expenditures.....	.0054	.0112	.1114	.0573
Obligations, current.....	-.0037	.0103	-.0836	-.0452
1-month lag.....	³ .0323	.0104	.3253	.3434
2-month lag.....	³ .0275	.0104	.2794	.2985
3-month lag.....	³ .0210	.0107	.2111	.2262
4-month lag.....	³ .0271	.0108	.2730	.2850
5-month lag.....	³ .0303	.0108	.3076	.3148
6-month lag.....	³ .0305	.0106	.3144	.3221
7-month lag.....	.0159	.0106	.1608	.1752
8-month lag.....	.0185	.0106	.1876	.2019
9-month lag.....	³ .0223	.0103	.2202	.2466
10-month lag.....	³ .0306	.0104	.3096	.3264
11-month lag.....	³ .0348	.0105	.3529	.3649
12-month lag.....	.0168	.0091	.1759	.2120
Unobligated appropriations.....	³ .0071	.0029	.5031	.2775
Budget.....	³ .0081	.0029	.9044	.3091
Intercept.....	805.8519	-----	-----	-----
R ².....	.7347	-----	-----	-----
Standard error of estimate.....	34.6737	-----	-----	-----
Degrees of freedom.....	72	-----	-----	-----
Durbin-Watson statistic.....	.3068	-----	-----	-----

¹ In thousands.² All money amounts are in millions of dollars.³ Significant at the 5-percent level.

TABLE 2.—*Aerospace Industries—Regression Analysis*[Dependent variable: Production workers]¹

Independent variable ²	Coefficient	Standard error	Beta	Partial correlation
Seasonal dummies:				
February.....	-0.2856	18.93	-0.0100	-0.0178
March.....	.1060	19.98	.0369	.0624
April.....	.2955	15.56	.0103	.0224
May.....	.1698	20.07	.0059	.0100
June.....	.2422	23.07	.0844	.1228
July.....	.6452	19.12	.0237	.0397
August.....	.1562	24.83	.0574	.0739
September.....	.3679	24.81	.1352	.1722
October.....	.4207	24.67	.1546	.1770
November.....	.4307	28.94	.1583	.1728
December.....	.6097	30.43	.2241	.2298
<i>t</i>	§ -8.2397	.7083	-3.1437	-.8079
<i>F</i>	§ .0346	.0045	1.5590	.6725
Current expenditures.....	.0040	.0082	.0600	.0575
Obligations, current.....	-.0023	.0075	-.0379	-.0360
1-month lag.....	§ .0240	.0076	.1769	.3479
2-month lag.....	§ .0205	.0076	.1525	.3036
3-month lag.....	§ .0149	.0078	.1097	.2197
4-month lag.....	§ .0191	.0079	.1409	.2754
5-month lag.....	§ .0218	.0079	.1519	.3098
6-month lag.....	§ .0213	.0077	.1605	.3084
7-month lag.....	.0094	.0077	.0696	.1423
8-month lag.....	§ .0019	.0078	.0880	.1776
9-month lag.....	§ .0158	.0076	.1175	.2394
10-month lag.....	§ .0222	.0076	.1643	.3235
11-month lag.....	§ .0267	.0077	.1973	.3794
12-month lag.....	§ .0131	.0067	.1005	.2254
Unobligated appropriations.....	§ .0046	.0021	.2416	.2506
Budget.....	§ .0056	.0022	.4572	.2932
Intercept.....	568.0707	-----	-----	-----
<i>R</i> ².....	.9238	-----	-----	-----
Standard error of estimate.....	25.3485	-----	-----	-----
Degrees of freedom.....	72	-----	-----	-----
Durbin-Watson statistic.....	.3501	-----	-----	-----

¹ In thousands.² All money amounts are in millions of dollars.³ Significant at the 5-percent level.

TABLE 3.—*Aerospace industries—Regression analysis*[Dependent variable: Production worker monthly man-hours]¹

Independent variable ²	Coefficient	Standard error	Beta	Partial correlation
Seasonal dummies:				
February	-117.4075	780.3	-0.0097	-0.0177
March	167.2887	823.7	.0138	.0239
April	-256.6500	641.7	-.0212	-.0471
May	-347.5373	827.5	-.0287	-.0494
June	147.2898	951.2	.0122	.0182
July	-797.1213	738.5	-.0695	-.1183
August	-127.6783	1024.0	-.0111	-.0147
September	687.8603	1023.0	.0600	.0790
October	807.6806	1017.0	.0704	.0932
November	894.8415	1193.0	.0780	.0881
December	153.0373	1254.0	.1334	.1423
<i>t</i>	³ -356.9214	29.2	-3.2292	-.8215
<i>t</i> ₂	³ 1.6258	1852	1.7354	.7190
Current expenditures	-.0001	.3378	-.0389	-.0382
Obligations, current .....	.0002	.3100	.0601	.0583
1-month lag	³ 1.0772	.3140	.1884	.3748
2-month lag	³ .9303	.3134	.1637	.3302
3-month lag	³ .6327	.3220	.1103	.2256
4-month lag	³ .7840	.3245	.1369	.2739
5-month lag	³ .8744	.3248	.1541	.3024
6-month lag	³ .9448	.3193	.1688	.3293
7-month lag .....	.5929	.3190	.1037	.2140
8-month lag	³ .6790	.3197	.1193	.2429
9-month lag	³ .7571	.3122	.1331	.2748
10-month lag	³ .8686	.3148	.1527	.3092
11-month lag	³ .9021	.3161	.1586	.3188
12-month lag .....	.4546	.2760	.0824	.1905
Unobligated appropriations .....	.0845	.0872	.1043	.1135
Budget .....	.1353	.0889	.2615	.1766
Intercept	25,279.4280			
<i>R</i> ² .....	.9272			
Standard error of estimate	1,045.1086			
Degrees of freedom	72			
Durbin-Watson statistic .....	.3708			

¹ In thousands.² All money amounts are in millions of dollars.³ Significant at the 5-percent level.

(2) Expenditures and obligations: The three sets of regression coefficients reveal that current expenditures and obligations are not significant explanatory variables of employment, but that lagged obligations are all positive, all greater than their standard errors, and nine out of 12 coefficients in each regression are statistically significant. The fact that expenditures were not significant casts some doubt on the hypothesis that the industry is dependent upon the government for its working capital needs, but the importance of obligations is strongly reinforced. Contrary to the findings of Ando and Brown, the effects of obligations are felt almost immediately (the first lagged value is significant) and effects are fairly well spread out over the year, with a rather sharp drop between the 11th and 12th coefficient.

(3) Announcement effects: The coefficients of the unobligated appropriations and the budget variables are statistically significant in two of the three regressions, and positive, though not significant, in the third. These variables appear to exert more effect on total workers than on production workers, both in terms of the magnitude of regression coefficients and standardized regression coefficients (*B*'s). Since total workers include managerial and research people whose employment may depend less on actual production contracts than on the preparation of proposals to the defense department based on expectations about the amount of subsequent production contracts, this result is consistent with a priori expectations.

The R^2 s are quite high, ranging from .73 to .93, and are highest for the production workers and the production man-hours equations. The Durbin-Watson statistic appears to indicate some degree of positive serial correlation of the residuals, although the published tables do not contain entries for the number of independent variables used in these regressions.

Several other sets of regressions were tried with lack of success. The first used outstanding obligation, lagged up to 6 months, as independent variables. They were not statistically significant and yielded low R^2 s. Another set of regressions used the data for the shipbuilding industry to estimate models similar to those reported above. The results were quite disappointing, with statistically insignificant coefficients and low R^2 s. Much of the trouble is no doubt due to the large and changing civilian component in employment.⁶

The importance of considering the effects of announcement and obligations variables on employment is illustrated in table 4. Three different models are used to generate the employment effects of the following postulated series of events: \$1 billion are added to the budget and included in an appropriations bill passed in August, a contract for that amount is let in September, and delivery takes place the following September. Model I utilizes the coefficients recorded in table 1. It includes both announcement effects and obligations. Model II is based on a similar regression with the announcement variables omitted. Model III assumes that the entire employment effect takes place at the time of delivery as assumed in several of the econometric models discussed above.

Model I accounts for a greater total of employment than model II and displays a rather different time pattern.⁷ By September, when the obligation is assumed to occur, the announcement variables have already generated 17 percent of the total employment. The percentage of employment accounted for by model I remains above that accounted for by model II for the whole period. Both models I and II, of course, predict a time rather different from that suggested by model III.

V. CONCLUSIONS

It will be convenient to consider the main conclusions of this study in four parts: an empirical description of the military procurement process, the implications for econometric models, data needs and availability, and directions for further research.

A. EMPIRICAL DESCRIPTION OF THE MILITARY PROCUREMENT PROCESS

Based on the description of the government spending process and the regressions for the aerospace industry, it is clear that an important role is played by the obligations variables. Beginning with a 1-month lag they exert an important influence for a year. In addition, evidence has been presented to indicate that two proxies for announcement

⁶ According to (18, p. 23), the 1958 portion of military output (according to value of output) for the shipbuilding and repairing industry was 61 percent. Further, Survey of Manufactures data reveal that the proportion of military shipbuilding has fluctuated from about 30 percent to over 50 percent.

⁷ A referee notes that employment drops following the new appropriation and the new obligation in model I. The former occurs because the coefficient for unobligated appropriations (.0071) is smaller than the coefficient for the budget variable (.0081). Perhaps this is because much of the preliminary planning and development is done in response to the announcement of the budget in January and is virtually completed by the time of the enactment of the appropriations in August. The drop in employment at the time of the hypothetical obligation in September is due to the negative, but insignificant, coefficient of current obligations (-.0037). I did not think it necessary to recompute the equation without this variable.

effects—budget and unobligated appropriations—have substantial impacts on employment.

TABLE 4.—*Employment resulting from a \$1,000,000,000 increase in budget, included in August appropriation bill, obligation incurred in September, and delivery made in following September*

Month	Model I			Model II			Model III, cumulative percentage of total employment
	Employment ¹	Cumulative employment ¹	Cumulative percentage of total employment	Employment ¹	Cumulative employment ¹	Cumulative percentage of total employment	
January.....	8,100	8,100	2.16	0	0	0.00	0
February.....	8,100	16,200	4.32	0	0	0.00	0
March.....	8,100	24,300	6.48	0	0	0.00	0
April.....	8,100	32,400	8.64	0	0	0.00	0
May.....	8,100	40,500	10.81	0	0	0.00	0
June.....	8,100	48,600	12.97	0	0	0.00	0
July.....	8,100	56,700	15.13	0	0	0.00	0
August.....	7,100	63,800	17.02	0	0	0.00	0
September.....	3,400	67,200	17.93	4,900	4,900	1.67	0
October.....	32,300	99,500	26.55	30,900	35,800	12.17	0
November.....	27,500	127,000	33.88	21,600	57,400	19.51	0
December.....	21,000	148,000	39.49	14,900	72,300	24.68	0
January.....	27,100	175,100	46.72	20,400	92,700	31.51	0
February.....	30,300	205,400	54.80	27,600	120,300	40.89	0
March.....	30,500	235,900	62.94	31,200	151,500	51.50	0
April.....	15,900	251,800	67.18	21,000	172,500	58.63	0
May.....	18,500	270,300	72.12	22,100	194,600	66.15	0
June.....	22,300	292,600	78.07	22,400	217,000	73.76	0
July.....	30,600	323,200	86.23	29,100	246,100	83.65	0
August.....	34,800	358,000	95.52	33,100	279,200	94.90	0
September.....	16,800	374,800	100.00	15,000	294,200	100.00	100.0
Total.....	374,800	-----	-----	294,200	-----	-----	-----

¹ Number of employees.

Time trend variables, acting as proxies for factors such as changes in the amount of employment in the SIC employment category associated with the corresponding budget category, proved to be highly significant. Seasonal dummies, however, were not significant. Expenditures were not a significant explanatory variable, in contrast to the findings of Ando and Brown. Whether this was due to differences in industry correspondence, time period covered, or estimation of expenditures was not investigated.

Unfortunately, similar regressions for the ship industry resulted in unsatisfactory coefficients and low R^2 s. This result was attributed to the significant and varying nonmilitary demand in the industry. However, the fact that different results were obtained with the two industries also suggests that some degree of industry disaggregation should be employed to obtain more accurate estimates of employment impacts.

B. IMPLICATIONS FOR ECONOMETRIC MODELS

The implications for existing and planned econometric models are clear. There are apparently important employment (and income) effects associated with announcements and obligations. Variables representing these effects should be included among the exogenous variables. Further, models which incorporate series on new or unfilled orders should recognize that part of these series—especially orders for military procurement—are exogenous to the system. They are under the control of the government, and should enter the model in such a way as to facilitate study of their impact on variables of interest.

C. DATA NEEDS

A few changes would seem fairly inexpensive and quite useful. These include breaking up the "ordnance, vehicles and related equipment" category into individual categories and publishing expenditures data on a gross basis. The former modification would permit a closer correspondence between employment and budget categories and the latter would provide a better estimate of amounts paid to business. It would also be desirable for other agencies of the government, particularly GSA, NASA, and AEC to release similar information on monthly obligations, with care being taken that these obligations are not also counted in the Department of Defense series when contracts are placed through the latter.

While on the subject of data, it might be noted that a study for the Joint Economic Committee entitled "A Federal Statistics Program for the 1960's" [19] does not include an improved series covering government obligations on its list of directions for improvement.

D. FURTHER RESEARCH

Given the present data availability, I do not think that the procedure followed in this paper can be applied to other industries. If appropriate data should become available, such studies would be quite valuable. Another direction for research would be to complete the description of the spending process by constructing models which relate expenditures and government purchases to lagged obligations and other variables.

An important area for research, not touched upon in this paper, is the question of economic impacts on particular regions. It is hoped that the present study has contributed to this research by pointing out the stage at which impacts are likely to occur. Again in the direction of disaggregation, more detail on the occupational mix of employment might be investigated. As noted above, there appear to be differences in the behavior of total employment and production worker employment. As longer series on research and development obligations become available, these differences might be useful for studying the dynamics of the demand for engineers and scientists.

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APPENDIX

The purpose of this appendix is to provide the sources of the data and the various adjustments made.

(1) INDUSTRY CORRESPONDENCE ⁸

The following correspondence was established between the budget categories used by the Department of Defense and the Standard Industrial Classification used for the employment data:

⁸ This correspondence was established with the aid of Prof. M. L. Weidenbaum, and is based on Census work sheets for industry classification.

TABLE A1.—*Category correspondence*

Industry name	Budget categories ¹	Standard industrial classification
Aircraft-missiles.....	Aircraft.....	Aircraft and parts (372).
Ships.....	Missiles.....	Ordnance and accessories (19).
	Ships.....	Shipbuilding and repairing (3731).

¹ These budget categories are the titles used in the most recent issues of the "Monthly Report on Status of Funds by Functional Title." Earlier years titles were somewhat different.

Work on missiles is divided between the aircraft and parts industry and the ordnance and accessories industry. It was not possible to include the entire ordnance budget classification, since in most recent years ordnance has been part of "ordnance, vehicles, and related equipment." Using this category would make it necessary to include the motor vehicles and parts industry employment category to pick up the vehicles component of the budget category, but this would involve including the civilian component of the industry as well. In this case, of course, the civilian component would dominate the data.

(2) EMPLOYMENT, HOURS, AND EARNINGS

These data were obtained from "Employment and Earnings, 1909-1961" [21] and current issues of the same publication. The variables are not seasonally adjusted.

(3) BUDGET

The budget amounts are taken from the U.S. budget for various years. Generally, the correspondence between the Department of Defense categories used in this study and the budget categories is easily established. An exception is the case of the Army budget, which for several years used the category "Ammunition and Guided Missiles." The portion included in missiles was taken to be the percentage of obligations for missiles and ammunition going to missiles for the year in question applied to the total budgeted amount for missiles and ammunition.

(4) EXPENDITURES, OBLIGATIONS, UNOBLIGATED BALANCES AND UNPAID OBLIGATIONS

The main source for these variables is the Department of Defense monthly release, "Monthly Report on Status of Funds by Functional Title." Amounts taken are those for "Military Functions."

(A) The amounts shown for expenditures are net of receipts from other government agencies (Mutual Defense, NASA, etc.) for whose account the Defense Department placed contracts.⁹ In an effort to arrive at a gross expenditures amount, which more accurately reflects payments to industry, a correction was added to expenditures. This correction was obtained by taking, for each year, outstanding obligations at the beginning of the year plus current obligations minus net expenditures. The resulting figure is compared with outstanding obligations at the beginning of the next year, and the difference is assumed to be the amount by which gross expenditures have been misstated. One-twelfth of the difference is added to each month. This correction was not possible for procurement in 1954 and research and development in 1960.

(B) Obligations data are taken directly as published from the Status of Funds Report.

(C) Status of Funds reports unobligated balances at the beginning of the year. This is diminished monthly by current obligations and then replenished by the annual appropriations. This latter amount is added in the month that the appropriations bill is reported out of the Joint Conference.¹⁰ Appropriations are derived by deducting end-of-fiscal-year uncommitted obligations from uncommitted obligations for the beginning of the next fiscal year. These estimates will include some minor accounting adjustments in addition to appropriations.

⁹ Thanks to Mr. Sheldon Taylor of the Department of Defense for explaining the intricacies of their account procedures.

¹⁰ Although the appropriations bills do not become law until signed by the President, I assume that the "announcement" effect operates at the time the bill is reported out of the Joint Conference for two reasons: first, the signing of the bill follows by a few days, so that it does not make very much difference; second, it is extremely unlikely that the bill will be vetoed, so that the bill's being reported out of the Joint Conference is tantamount to approval of the appropriations.

THE RELATIONSHIP OF NEW ORDERS TO SHIPMENTS OF DEFENSE PRODUCTS

BY MAW LIN LEE*

INTRODUCTION

In recent discussions about how an econometric model can be effectively used to evaluate the impacts of government operations, it has been pointed out that the development of a realistic model of the government sector is a prerequisite [6]. There are two aspects to this problem: (i) An econometric model should include appropriate instrumental variables—variables that can be controlled by policy makers [11], and (ii) the model should properly capture the impacts of the government actions [1, 2, 4, 13]. The research presented here is in one sense an exploratory work to fill out knowledge about these two aspects of the problem.

Since defense procurement accounts for approximately 10 percent of GNP, a question which naturally arises is: Can defense procurement be manipulated by the government to help stabilize economic activity or to offset cyclical fluctuations? It is to be expected that the timing of defense procurement is determined primarily by non-economic considerations. In peace time, however, a certain degree of flexibility is presumed to exist in the scheduling of defense procurement. For this reason, defense procurement can be considered a candidate for instrumental variables to be included in econometric models.

In entering defense procurement as a candidate for instrumental variable, the next question being raised is: What stage in the defense procurement process is most important from the viewpoint of measuring its impact on economic activity? In a limited way in which defense procurement was considered in major econometric models, econometricians tend to measure its impacts at the expenditure stage [3, 5, 7, 8, 9, 10, 12]. Except for progress payments, expenditure however, is made after final product is completed and delivered. Because of the nature of defense products, little or no inventories are accumulated by the defense industries in anticipation of order or contracts. In fact, most defense procurement involves direct negotiations between the Department of Defense and defense industries. It can therefore be assumed that the production process begins after the defense industries accept an order and sign a contract with the Defense Department. As the industries take steps to fill the order, employment, output, and income payments are affected. What this implies is that the impacts of defense procurement on GNP (through employment, income, output, and inventories) are felt prior to the

*The author, who is assistant professor of economics at Washington University, St. Louis, Mo., wishes to express his gratitude to Prof. M. L. Weidenbaum for sharing his knowledge of the military procurement process and data sources and for helpful comments on an earlier draft of this paper. Prof. Edward Greenberg also contributed valuable ideas on econometric models of the government sector. Thanks are due to Norbert Budde and Robert Keller for assistance. The project was supported by NASA through its grant NsG-342 to Washington University.

expenditure stage. In fact, expenditure and delivery of shipment usually signals the end of the impacts of a given defense procurement. Because of this, it is not the sales or the expenditure, but the letting of new orders that should be investigated to measure the impacts of defense procurement on economic activity.

A study of the nature of structural lags between new orders and shipments will not directly reveal the impacts of defense procurements on economic activity. But on the assumption that the placement of new orders signal the beginning and shipments signal the end of the impacts of defense procurements, a study of the nature of structural lags does indicate the duration of such impacts. On the one hand, this knowledge is useful for model building in econometrics. On the other, it will be useful for the timing of fiscal and monetary policies to coincide with or offset any changes in defense procurement.

THE NATURE OF ORDERS-SHIPMENTS RELATIONSHIP

Defense products, as defined by the Bureau of Census,¹ include communication equipment, complete aircraft, aircraft parts, and ordnance. These products vary in characteristics. The length of time required for the production of some of these products may be quite short. However, for products such as complete aircraft and missiles, 2 years or so may be elapsed before an order results in shipments.

From a technical viewpoint, it can be assumed that new orders placed during a given period, O_t , will not result in shipments during the same period. It is also assumed that a proportion, α_{t+1} , of O_t results in shipments in $(t+1)$; and a proportion, α_{t+2} , of O_t results in shipments in $(t+2)$, etc. As a first approximation, we assume that all or nearly all of the new orders placed during t , O_t , are filled within a period of 2 years (eight quarters). This order-shipment relationship can be restated as that the current shipments, S_t , are derived from new orders placed during the preceding eight quarters, O_{t-1} , O_{t-2} , . . . , O_{t-8} .

The length of time required for an order to be filled can be said to depend on (1) state of technology, (2) the nature of product, and (3) the extent of capacity utilization. Technological condition and the nature of product can be regarded as long run factors which affect the nature of structural lags or the order-shipment relationship through α 's. The rate of capacity utilization, on the other hand, may be regarded as a shortrun factor the effect of which on the order-shipment relationship may be assumed to be additive. That is, the fuller the capacity is utilized, the smaller the size of S_t will be, and vice versa.

On the assumption that technology and the nature of products remain constant over the sample period, we postulate that:

$$S_t = \alpha_0 + \alpha_1 O_{t+1} + \alpha_2 O_{t-2} + \dots + \alpha_8 O_{t-8} + \alpha_9 R_t + U_t$$

Where α 's represent the proportions of new orders placed during each of the periods $t-1$, $t-2$, . . . , $t-8$, that result in current shipment, S_t . α_0 is introduced to take care of systematic deviations from the hypothesis and α_9 shows the effect of the rate of capacity utilization R_t on S_t . U_t is introduced to account for any random disturbances.

¹ See Bureau of Census publication: "Manufacturers' Shipments, Inventories, and Orders: 1947-63 Revised."

The assumption that technology and the nature of products remain unchanged is not entirely realistic however. In fact, the advancement in military technology and changes in the nature of products during the past 15 years were unprecedented in history. From the viewpoint of individual products, technological progress will improve the quality of product and/or the methods of production. An improvement in production methods may shorten the length of time required for the production of a given product. In other words it may shorten the structural lags between new orders and shipments of the product in question. However, a more apparent result of technological progress is the introduction of new products. As new products are introduced, the product mix changes.² This is evident in that the proportion of defense procurement devoted to missiles and electronic equipment, which have high technology content, has been increasing since the early 1950's.

A change in product mix undoubtedly will alter the nature of structural lags between new orders and shipments of defense products. Because of this, the assumption that the nature of structural lags remains unchanged throughout the sample period will have to be relaxed. In other words, instead of assuming the fixed values of α 's as in equation (1), we assume that α 's are a function of product mix. That is to say, the nature of structural lags as indicated by α 's changes with a change in product mix.

There is no precise measurement of how product mix changes. However, as noted above, the growing importance of missiles and electronic equipment may be a good indicator and is used as proxy for changes in product mix. This variable is quantified by taking the ratio of the obligations on missiles and electronic equipment to the obligations on the total defense procurement. This ratio ranges from a low of .07 to a high of .43 over the sample period.

On the assumption that the nature of structural lags is a function of product mix P_t , we write:

$$\alpha_{1t} = \alpha_{10} + \alpha_{11}P_{t-1} \tag{2}$$

$$\alpha_{2t} = \alpha_{20} + \alpha_{21}P_{t-2} \tag{3}$$

$$\alpha_{3t} = \alpha_{30} + \alpha_{31}P_{t-3} \tag{4}$$

.....

$$\alpha_{8t} = \alpha_{80} + \alpha_{81}P_{t-8} \tag{8}$$

Substituting equation (2) through (8) in equation (1), we obtained:

$$S_t = \alpha_0 + (\alpha_{10} + \alpha_{11}P_{t-1})O_{t-1} + (\alpha_{20} + \alpha_{21}P_{t-2})O_{t-2} + (\alpha_{30} + \alpha_{31}P_{t-3})O_{t-3} + \dots + (\alpha_{80} + \alpha_{81}P_{t-8})O_{t-8} + \alpha_9 R_t + U_t \tag{9}$$

Rewriting (9), we have:

$$S_t = \alpha_0 + \alpha_{10}O_{t-1} + \alpha_{20}O_{t-2} + \dots + \alpha_{80}O_{t-8} + \alpha_{11}(PO)_{t-1} + \alpha_{21}(PO)_{t-2} + \dots + \alpha_{81}(PO)_{t-8} + \alpha_9 R_t + U_t \tag{10}$$

² This study is concerned with the relationship of new orders to shipments of defense products in aggregate term. The order-shipment relationships of individual products are not within the scope of this investigation.

In order to preserve as many degrees of freedom as possible, it is assumed that:

$$\alpha_{11} = \alpha_{21} = \beta_{10}$$

$$\alpha_{31} = \alpha_{41} = \beta_{11}$$

$$\alpha_{51} = \alpha_{61} = \beta_{12}$$

$$\alpha_{71} = \alpha_{81} = \beta_{13}$$

and denote:

$$\alpha_0 = \beta_0$$

$$\alpha_{10} = \beta_1$$

.

$$\alpha_{80} = \beta_8$$

$$\alpha_9 = \beta_9$$

Equation (10) is then rewritten as:

$$S_t = \beta_0 + \beta_1 O_{t-1} + \beta_2 O_{t-2} + \dots + \beta_8 O_{t-8} + \beta_9 R_t + \beta_{10} \{ (PO)_{t-1} + (PO)_{t-2} \} + \beta_{11} \{ (PO)_{t-3} + (PO)_{t-4} \} + \beta_{12} \{ (PO)_{t-5} + (PO)_{t-6} \} + \beta_{13} \{ (PO)_{t-7} + (PO)_{t-8} \} + U_t \tag{11}$$

Equation (11) shows that S_t is dependent on previous new orders, the interaction of new orders with product mix, and the rate of capacity utilization.

3. DATA AND STATISTICAL RESULTS

Data on the new orders, shipments, unfilled orders, and inventories of defense products are published by the Bureau of Census as monthly series in "Manufacturers' Sales, Inventories, and Orders." To avoid the necessity of including an excessive number of lagged variables in the equation, the data are aggregated to obtain a quarterly series. This aggregation reduced the size of observations to a smaller number. But it also resulted in some loss of precision. Seasonally adjusted data are used in this investigation.

The rates of capacity utilization are those of the Federal Reserve Board series. The ratios of the obligations on missiles and electronic equipment to the obligations on total procurement are calculated from various issues of *Monthly Report on Status of Funds* published by the Department of Defense.

The statistical estimates of equation (1) are summarized in table 1.

TABLE I

Variables	Coefficients	Standard errors	Variables	Coefficients	Standard errors
Constant.....	438.21		O_{t-6}	0.1142	0.0693
O_{t-1}.....	.1366	0.0631	O_{t-7}.....	.0190	.0636
O_{t-2}.....	.1464	.0665	O_{t-8}.....	.0024	.0548
O_{t-3}.....	.1707	.0680	R_t	-.0413	.0140
O_{t-4}.....	.1640	.0707	$R^2 = .3189$	$d.f. = 30$	
O_{t-5}.....	.1189	.0745	$Se = 33.24$	$d = .6697$	

An interesting aspect of the above estimates is that the effects of new orders, O , on shipments, S , first increases then decreases with the increase in lags. The coefficients for O_{t-3} and O_{t-4} indicate that the largest proportions of new orders placed during a given period result in shipments three and four quarters later. The coefficients for O_{t-7} and O_{t-8} are respectively .0190 and .0024 suggesting that current shipments are derived from a very small proportion of new orders placed more than seven or eight quarters ago. In other words, most of the new orders placed in a given period were filled within a period of six quarters. From another viewpoint, the results indicate that the duration of the impacts of a given order for defense products is approximately a year and 6 months.

As expected, the extent of capacity utilization is inversely related to shipments: The fuller the capacity is utilized, the smaller the size of shipments will be and vice versa.

The estimates for equation (11) are summarized in table 2.

TABLE 2

Variables	Coefficients and standard errors	Variables	Coefficients and standard errors
Constant	26.2834	O_{t-6}	.0889 + .1277 P_{t-6} (.0564)(.1114)
O_{t-1}	.0490 + .0001 P_{t-1} (.0566)(.0422)	O_{t-7}	.0278 + .2335 P_{t-7} (.0514)(.0906)
O_{t-2}	.0642 + .0001 P_{t-2} (.0626)(.0422)	O_{t-8}	-.0088 + .2335 P_{t-8} (.0451)(.0906)
O_{t-3}	.0903 - .0452 P_{t-3} (.0569)(.0931)	R_t	-1.4559 (1.2900)
O_{t-4}	.0708 - .0452 P_{t-4} (.0642)(.0931)	$R^2 = .9019$	$d_f = 26$
O_{t-5}	.0573 + .1277 P_{t-5} (.0608)(.1114)	$S_t = 26.28$	$d = 1.025$

The addition of product mix P_t as an explanatory variable raises the R^2 from .8189 (table 1) to .9019 (table 2). This change in the R^2 of .0830 is highly significant statistically.

The estimated value of α 's are illustrated for $P_t = .05, .10, .15, .20, .25, .30, .35, .40, \text{ and } .45$ in table 3.

TABLE 3

P	O_{t-1}	O_{t-2}	O_{t-3}	O_{t-4}	O_{t-5}	O_{t-6}	O_{t-7}	O_{t-8}
.05	0.0490	0.0642	0.0880	0.0685	0.0637	0.0953	0.0395	0.0029
.10	.0490	.0642	.0858	.0663	.0701	.1017	.0512	.0146
.15	.0490	.0642	.0835	.0640	.0765	.1081	.0628	.0262
.20	.0490	.0642	.0813	.0618	.0828	.1144	.0745	.0379
.25	.0490	.0642	.0790	.0595	.0892	.1208	.0862	.0496
.30	.0490	.0642	.0767	.0572	.0956	.1272	.0979	.0613
.35	.0490	.0642	.0745	.0550	.1020	.1336	.1095	.0729
.40	.0490	.0642	.0722	.0527	.1084	.1400	.1212	.0846
.45	.0490	.0642	.0700	.0505	.1148	.1464	.1329	.0963

Tables 2 and 3 show that the changes in product mix as indicated by P_t does not have any effect on the relationship of O_{t-1} and O_{t-2} to S_t . Most of the new orders that result in shipments within a short period, say 6 months, are those for component parts of defense products. It is reasonable to assume that change in product mix will have little effects on the relationship between new orders and shipment of these products.

Changes in product mix, however, have effects on the relationships of $O_{t-3}, O_{t-4}, \dots, O_{t-8}$, to S_t . The magnitude of coefficients for

O_{t-3} and O_{t-4} is inversely related to P_t , while that for O_{t-5} , O_{t-6} , O_{t-7} , O_{t-8} varies with the value of P_t . A change in product mix over the sample period indicates a shift from conventional defense products which have relatively lower technology content to missiles and electronic equipment which have relatively higher technology content. The time required for the production of conventional defense products is shorter than that required for the production of missiles and electronic equipment. As the proportion of defense procurement going to missiles and electronic equipment increases, the proportion of new orders that is filled within three or four quarters decreases while the proportion that is filled between five and eight quarters increases.

The nature of structural lags between new orders and shipments varies with the change in product mix. This also implies that the duration of defense procurement impact on economic activity increases as the proportion of expenditure going to products with high technology content, such as missiles and electronic equipment, increases.

4. CONCLUDING REMARKS

The statistical estimates of the structural lags between new orders and shipments implied that the impacts of defense procurement on economic activity are spread over a period of approximately a year and a half. The duration of these impacts, however, is dependent on product mix. The larger the proportion of defense procurement going to products with high technological content, the longer the duration will be. In considering the implications for fiscal and monetary policies to meet any change in defense procurement, the duration of such impacts needs to be taken into account.

It is beyond doubt that the appropriate stage of defense procurement should be introduced as an instrumental variable in the government sector of econometric models. The study presented here does not directly investigate the impacts of defense procurement on such activities as production, employment, and income. Nor does this study investigate orders that are generated by subcontracting. These need to be investigated directly.

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Part IV

REGIONAL AND INDUSTRIAL IMPACTS

Frequently asked questions are those inquiring about Defense expenditure impacts on a firm, an industry, a community, or on an economic region. This part's papers attempt to illuminate these areas of inquiry.

THE ECONOMIC IMPACT—INDUSTRIAL AND REGIONAL— OF AN ARMS CUT*

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I. THE PROBLEM AND ITS ANALYTICAL FORMULATION

1. The object of the computations described in this paper was to determine what effect a hypothetical reduction in military accompanied by a compensating increase in nonmilitary demand would have on the industrial composition and regional distribution of employment in the continental United States. By compensation is meant the maintenance of the total level of employment in the economy.

In a paper published 4 years ago,¹ input-output analysis was used to estimate the effect of such a change in the structure of final demand on the industrial distribution of the labor force for the country as a whole. The present study carries that inquiry one step further. The impact of the hypothetical shift from military to civilian demand is projected here not only in interindustrial, but also in interregional terms. Specifically, the territory of the continental United States has been subdivided into 19 distinct regions, and the shift in the industrial composition of output and employment was assessed for each one of them.

Had we attempted to study each region separately and then simply to add the results to arrive at corresponding aggregates for the country as a whole, the total national output figures and the corresponding total input figures for each distinct category of goods and services could not have been expected to match. In other words, the results of such isolated regional studies would not comprise a consistent picture of the national economy as a whole. The simple scheme of multiregional analysis on which the present computations are based provides for simultaneous balancing of all input-output flows from the point of view of each individual region, as well as for the U.S. economy as a whole.

For some goods—let them be called local—a balance between production and consumption tends to be established separately within each region; for other goods—let them be identified as national—such a balance typically is achieved only for the country as a whole. Within each region the output of a national good might exceed or fall short of its total input, the deficit or surplus being evened out by exports to or imports from other regions. Retail trade and auto repair services are characteristically local industries while coal mining and aircraft manufacturing are typically national. The difference

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¹ Wassily Leontief and Marvin Hoffenberg, "The Economic Effect of Disarmament," *Scientific American*, April 1961.

between the two obviously should be explained in terms of the relative mobility or transportability of their output.

To separate national industries from the local, all sectors were arranged in order of the increasing magnitude of interregional, as compared with the intraregional, trade of their respective products. Then, an admittedly somewhat arbitrary cut was made across that array, setting apart the local industries, serving mainly users located within the region in which production occurs, from the national industries, supplying the entire national or even international market, whose products typically are being shipped for this reason in comparatively large amounts across regional lines.²

2. The multiregional input-output computation itself can be visualized best as being performed in three distinct, successive rounds. The first consists of a conventional input-output calculation designed to determine the direct and indirect effects of the given shift from military to nonmilitary final demands on the total output of all—that of local as well as of national—goods for the country as a whole. The regional distribution of these total figures is determined in the second and the third rounds. All basic information on the input structure of each local or national industry used again and again throughout these computations stems from the same large input-output table of the American economy. This common source of structural data ensures the internal consistency of all the final results.

For national industries the regional apportionment of the increase or the reduction in the total U.S. output is based in each instance on a simple, but in the first approximation, well-justified assumption of a uniform percentage change. For example, if the first stage computation indicates that as a result of curtailed military purchases and a simultaneous expansion of deliveries serving various types of final civilian demand, the total U.S. output of electronic equipment will fall by 5 percent, then in the second stage that aggregate cut is allocated among the different regions on the assumption of an equal 5 percent cut applied across the board. That presupposes, of course, knowledge of the actual output and employment levels maintained by the national industries in each region before the shift occurs.

The third and last step determines the geographic distribution of changes in the level of activities of local industries producing goods for which the balance between supply and demand tends to be maintained within each region with relatively limited recourse to interregional trade. The input requirements that must be covered in each region by the output of its local industries comprise: (a) deliveries to final military and civilian users located in the same region; (b) input requirements of the national industries operating in it; and (c) the input requirements of the local industries themselves.

Thus, the calculation of regional outputs of local industries requires not only a knowledge of final demand for the United States as a whole, but also a breakdown of military and nonmilitary final demand by regions. While changes in the level of final deliveries of steel, chemicals, and other national goods need be specified only for the country as a whole, the given shifts in military procurement and civilian purchases of electric power, gas and water, office supplies, and other local goods have to be specified separately for each region before the analysis of their regional impact can begin. The amounts of local

² The concluding observations at the end of this article describe a possible refinement of this approach which introduces a graduated distinction between national, regional, and subregional industries and goods.

goods absorbed in each particular region by national industries operating in it can be ascertained easily by applying appropriate sets of technical input coefficients to the regional output figures derived for all national industries in the previous, second round of computations.

The regional output levels of local industries, finally, can be derived through separate input-output computations in which the deliveries of local goods to final users located in each region and to national industries operating within it play the role of a given bill of goods.

3. In this last stage of the multiregional analysis, households is treated as one of the local industries—the largest one in fact. The out put of that industry consists of labor services of various types. In contrast to previous computations of this kind, *for reasons of practical convenience the quantities of labor services are measured in this study not in man years but rather in terms of the total wage and salary payments received for them.*

The inputs of the household sector are consumer goods purchased by it. Its input structure, like the input structure of any other industry, can be described accordingly by an array of consumption coefficients, each of which represents the amount of one particular type of good absorbed by the household sector per unit of its own output, *i.e.*, per dollar of salaries and wages received by it.

That means, of course, that in the third stage of the multiregional input-output computations, the given regional bill of goods is redefined so as to include all military and non-military governmental purchases and private investment expenditure, but not the private consumption expenditures. Since households is treated at this stage of the computations as one of the local industries, all goods absorbed by it appear not as final deliveries, but rather as components of that part of all output of each sector that serves indirect demand.

The internal consistency of the entire procedure is demonstrated by the fact that, if separated from deliveries to other local and all the national industries and summed for the country as a whole, these regional inputs into households will match exactly the private consumption column of the final bill of goods introduced into the computation in its very first stage.

4. That bill of goods itself, of course, must reflect the anticipated effect of a hypothetical reduction of military and a corresponding increase in civilian expenditures. For purposes of the present analysis, such a shift has been assumed to have occurred in the year 1958, which at the present time is the latest year for which a detailed input-output table of the U.S. economy has been compiled. The final bill of goods is represented by three components: Military purchases, private household consumption, and nonhousehold civilian final demand.³ The latter demand "contains" non-military deliveries to the Federal, State, and local governments, private and public gross investment, and net exports.

The hypothetical cut in military expenditure is visualized to take the form of a 20-percent, across-the-board reduction in each kind of military purchase. With the total 1958 defense expenditure included in the military vector amounting to \$31.3 billion, that means reducing

³ Morris R. Goldman, Martin L. Marimont, and Beatrice N. Vaccara. "The Interindustry Structure of the United States, a report on the 1958 Input-Output Study," *Survey of Current Business*, U.S. Department of Commerce, November 1964, Washington, D.C. A detailed description of the definitions and composition of the final demand vectors used in this study is given in sec. IV. The vectors only include estimates of final purchases from endogenous industries, *e.g.*, the military vector does not include purchases from new construction since this is exogenous in this study. Thus, the sum of the elements included in the vectors does not represent all final demand. See footnotes to table A-3.

it by \$6.3 to \$25 billion.³ The compensating rise in nonmilitary demand was assumed, on the other hand, to be represented by a proportional across-the-board increase in all kinds of nonmilitary final deliveries. Its total magnitude is chosen deliberately with the view of maintaining the total level of employment, or rather the combined wage and salary bill of all industries, at its original—that is, the actually observed—1958 level.

Had the military shopping list contained the same goods and in the same proportions as the civilian, each million dollars' worth of additional nonmilitary demand could reemploy the same number of hands and heads—commanding the same amount of wages and salaries—as would have been released by each million dollars' worth of military budget cut. However, the military product mix is very different from the civilian. A comparison of the results of two auxiliary input-output computations has shown that in 1958 the total wages and salaries paid for all the labor engaged directly and indirectly in production of one million dollars' worth of goods and services combined in the proportion demanded by the military are some 21 percent larger than wages and salaries paid for labor inputs required for production of \$1 million worth of outputs delivered in amounts reflecting the average product mix of all nonmilitary final users.

Thus, it would take \$7.6 billion of additional civilian demand to compensate the cancellation of \$6.3 billion worth of military spending. Nonmilitary final demand, as defined for this study, amounted in 1958 to \$418 billion.³ Stated in percentage terms, the shift in the economic impact as described below combines a 20-percent cut in military purchases with a 1.8 percent increase in the amount of goods and services absorbed by each of the two categories of final civilian users.

With the total labor input and wage bill remaining constant, a 1.8 percent increase in the amount of all goods and services allocated to private consumption can be described as a proportional increase in all consumption coefficients. Accordingly, the column of technical coefficients used in the last stage of the multiregional input-output computations to describe the input requirements of households was obtained by raising by 1.8 percent the consumption coefficients derived from the 1958 U.S. input-output table.

A translation of the theoretical scheme described above into concise mathematical language is presented below. A reader not interested in details of computational procedure can skip part II and proceed directly to part III containing a summary of the principal conclusions of this study.

II. MATHEMATICAL FORMULATION OF A LINEAR MULTIREGIONAL INPUT-OUTPUT SYSTEM⁴

1. NOTATION

The multiregional economy described below consists of (n) national and ($l-1$) local industries. When households is treated as an endogenous sector the total number of local sectors is (l). The locational distribution of all inputs and outputs is specified in terms of (r) distinct regions.

⁴ The first—materially different, but formally similar to the present—version of that system was presented in Wassily Leontief (Ed.), *Studies in the Structure of the American Economy*, (Oxford University Press: New York, 1953), ch. 4.

The quantities of all goods, including the labor services, are measured in physical units defined in each instance as "the amount purchasable for \$1, at 1958 prices."

Capital letters are used to designate rectangular and square matrices, lower case Latin letters to describe column and row vectors, and Greek letters to define scalar magnitudes, except matrix dimensions, which are in parentheses:

- A —square, $(n+l-1)$ by $(n+l-1)$, matrix of input coefficients of all national and local industries, excluding households.
- A^* — $\begin{bmatrix} A_{NN}^* & A_{NL}^* \\ A_{LN}^* & A_{LL}^* \end{bmatrix}$ augmented square, $(n+l)$ by $(n+l)$, matrix of input coefficients of all sectors including households, partitioned into:
- A_{NN}^* —square $(n \times n)$ submatrix of input coefficients describing flows from national to national industries.
- A_{NL}^* —rectangular $(n \times l)$ submatrix of input coefficients describing flows from national to local sectors, including households.
- A_{LN}^* —rectangular $(l \times n)$ submatrix of input coefficients describing flows from local industries, including households, to national industries.
- A_{LL}^* —square $(l \times l)$ submatrix of input coefficients describing flows from local to local industries, including households.
- w' —row vector of $(n+l-1)$ labor input coefficients of all national and local industries, excluding households.
- c_0^* —column vector of the original $(n+l)$ consumption coefficients, *i.e.*, the input coefficients of households, including the coefficients describing inputs from from households to households.
- c_1^* —column vector of $(n+l)$ consumption coefficients, including the input from households to households, adjusted to the change in the level of living which has resulted from the shift in final demand.
- x —column vector of $(n+l-1)$ total outputs of national and local industries, excluding households.
- x^* — $\begin{bmatrix} x_N \\ x_L \end{bmatrix}$ column vector of $(n+l)$ total outputs of all sectors partitioned into:
 x_N column vector of (n) total outputs of national industries, and
 x_L column vector of (l) total outputs of local industries, including households.
- \hat{X}_N —diagonal matrix with the total outputs of national industries entered on its principal diagonal in the same order in which they are shown in x_N .
- m, h, q —three column vectors of $(n+l-1)$ quantities, measured in 1958 dollars, of national and local goods, excluding labor, representing respectively the military, the household and the nonhousehold civilian component of the original, total final bill of goods.
- m^*, q^* —two column vectors of $(n+l)$ quantities of military and nonhousehold civilian final demand, including labor.
- v_M, v_H, v_Q —three amounts of labor directly entering respectively into the military, the household and the nonhousehold civilian demand components of the original, total final bill of goods.
- \hat{M}_L^*, \hat{Q}_L^* —two diagonal $(l \times l)$ matrices of quantities of local goods, including labor, representing respectively the military and the nonhousehold civilian component of the original, total final bill of goods.
- X_N^R —rectangular $(n \times r)$ matrix each column of which shows the output levels of all national industries in one particular region.
- P_N —rectangular $(n \times r)$ matrix each column of which shows what fractions of the total output of each of the national industries are produced in one particular region.
- $D_M^* P, D_Q^*$ —rectangular $(l \times r)$ matrices the columns of which represent respectively proportions of the total military and of nonhousehold civilian final demand for the products of different local industries, including households, absorbed in one particular region.
- α —the ratio of the magnitude of each element of total final military demand after the shift from military to nonmilitary expenditure to its magnitude before the shift.
- β —the ratio of the magnitude of each element of the household and of the non-household civilian components of total final demand after the shift from military to nonmilitary expenditures to its magnitude before the shift.

2. DERIVATION OF COMPUTATIONAL FORMULAE

Basic relationship between the total final bill of goods—comprising deliveries to household, nonhousehold civilian, and military final demand—and the total outputs of the national and local industries, excluding households:

$$x = (I - A)^{-1}[h + q + m]. \quad (1)$$

Corresponding relationship between the original, total level of employment and the combined labor inputs indirectly absorbed by all national and local industries plus those directly entering final demand:

$$v = w'x + v_H + v_Q + v_M. \quad (2)$$

Relationship between the new final bill of goods and the new total level of employment that—by assumption—equals the original level of employment:

$$v = w'(I - A)^{-1}[\beta(h + q) + \alpha m] + \alpha v_M + \beta(v_H + v_Q). \quad (3)$$

Solution of the equation (3) above for β , with all other magnitudes appearing on the right-hand side considered as given:

$$\beta = \frac{v - \alpha[w'(I - A)^{-1}m + v_M]}{w'(I - A)^{-1}(h + q) + v_H + v_Q}. \quad (4)$$

Derivation of the new vector of the input coefficients of the household sector through adjustment of the original vector to the shift in the level of living:

$$c_0^* = c_0^* \beta. \quad (5)$$

Derivation of the new⁵ total output levels of national and local industries, including households:

$$x^* = (I - A^*)^{-1}[\beta q^* + \alpha m^*]. \quad (6)$$

Derivation of the new regional outputs of national industries from their new total outputs:

$$X_N^R = \hat{X}_N P_N. \quad (7)$$

Derivation of the new regional outputs of local industries, including households:

$$X_L^{*R} = (I - A_{LL}^*)^{-1}[A_{LN}^* X_N^R + (\beta \hat{Q}_L^* D_Q^* + \alpha \hat{M}_L^* D_M^*)]. \quad (8)$$

The sum of the last two terms is a rectangular ($l \times r$) matrix each column of which represents the new combined military and nonhousehold civilian final demand for the products of local industries—including households—in one particular region. The multiplication of $\beta \hat{Q}_L^*$ by D_Q^* and $\alpha \hat{M}_L^*$ by D_M^* are analogous to that performed on the right-hand side of (7); it involves application of given sets of

* Strictly speaking, a subscript should be used to distinguish old and new outputs.

regional distribution coefficients to previously obtained total figures of final military and nonhousehold civilian deliveries of each kind of local good. Any other method of determining the amounts of local goods absorbed by military and nonhousehold civilian final demand in each region would be equally acceptable, provided the regional figures add up to the corresponding elements of the diagonal matrix ($\beta Q_L^* + \alpha M_L^*$); *i.e.*, provided the sum of all regional deliveries of each local good equals the corresponding total amount of military and nonhousehold civilian deliveries for the country as a whole.

One of the l rows of the rectangular matrix X_{L}^{*R} on the left-hand side of (8) describes the new regional outputs of the household sector, that is the level of employment attained in each region after the hypothetical shift in the relative magnitude of the military and of the nonmilitary components of final demand.

The formulae presented above describe the computations of regional output and employment figures after the shift from military to nonmilitary expenditures. If the proportionality factors α and β are set equal to 1, the formulae describe the state of the economy and, in particular, the level and regional distribution of output and employment before the shift.

III. SUMMARY OF THE PRINCIPAL FINDINGS

1. When the numerical conclusions presented are based on a straightforward application of a systematically developed theoretical theme, the results need little additional explanation. In the present instance most of the explaining was done when the procedure was described by which the primary factual information fed into an analytical machine is transformed into final figures describing the results of the entire computation. They appear in the form of tables which describe in great detail changes in the interindustrial and the interregional distribution of output and employment that would be brought about by a hypothetical 20 percent reduction in the military bill of goods, combined with a compensating proportional increase in the nonmilitary components of the final bill of goods. This nonmilitary demand comprises consumption by private households, total investment, which includes new construction, and nonmilitary governmental expenditures.

A detailed explanation of sources and methods used to obtain the basic matrix of input-output coefficients of all national and local industries, to ascertain the actual composition of the military and nonmilitary vectors of the final bill of goods for the year 1958 and last, but not least, to determine the regional distribution of the outputs of national industries and of the final military and nonmilitary demand for locally produced goods will be found in section IV below.

The number of industries in terms of which the productive apparatus of the American economy is described is 58, and the number of regions into which the territory of the continental United States was subdivided for purposes of this description is 19; thus, the total number of output and employment figures resulting from this multiregional input-output computation could exceed 1,000; in fact, since not all industries are present in all regions, the detailed tables reproduced in the appendix contain a certain number of empty cells.

Since the hypothetical shift in the composition of final demand was balanced so as to leave the overall level of employment for the country as a whole the same as it was before, its economic impact takes the form of shifts in the labor force among different industries and among different regions.

The magnitudes of changes in output and employment that we are about to examine are—when expressed in relative terms—at most of the order of a few percentage points up or a few percentage points down; in most instances, they are even smaller. Considering, however, that an unemployment rate of 5.5 percent commonly is interpreted as a sign of serious malfunctioning of our economic system and that an eventual reduction of that figure to 4 percent has been recognized as one of the major goals of national economic policies, even a one-half of 1 percent change in employment level in one region or another must be taken to represent a noteworthy shift. The percentages to be examined may not meet that degree of accuracy, but they should indicate the direction of change in regional employment levels.

TABLE 1.—Percentage changes¹ in output and employment² by industries, after a compensated³ 20 percent cut in armament expenditures⁴

Sector number ⁵	Industry	Percentage change	Sector number ⁵	Industry	Percentage change
36N	Aircraft.....	-16.05	13N	Wood containers.....	1.05
40N	Ordnance.....	-15.42	27N	Stone and clay.....	1.10
41N	Research and development.....	-13.26	1L	Printing, publishing.....	1.12
34N	Electronics equipment.....	-5.40	10L	Business services.....	1.14
29N	Nonferrous metals.....	-2.21	8N	Fabrics, yarn.....	1.19
38N	Instruments.....	-1.59	15N	Office furniture.....	1.19
32N	Electrical apparatus.....	-0.92	20N	Drugs.....	1.21
37N	Other transportation equipment.....	-0.23	35N	Motor vehicles.....	1.21
28N	Iron and steel.....	-0.04	39N	Miscellaneous manufacturing.....	1.23
31N	Nonelectrical machinery.....	-0.03	2L	Electricity, gas, water.....	1.24
18N	Chemicals.....	0.15	12N	Lumber, wood products.....	1.26
13L	Maintenance construction.....	0.20	5L	Communications.....	1.26
24N	Rubber, plastics.....	0.30	14N	Household furniture.....	1.27
33N	Appliances, lighting.....	0.34	12L	Medical, educational services.....	1.31
22N	Oil fields.....	0.38	3N	Forestry, fisheries.....	1.33
23N	Petroleum products.....	0.45	4L	Trade.....	1.40
3L	Transportation.....	0.48	6L	Finance, insurance.....	1.48
21N	Paint.....	0.48	9L	Auto repair services.....	1.48
30N	Fabricated metals.....	0.54	8L	Personal services.....	1.56
11N	Miscellaneous fabricated textiles.....	0.54	25N	Leather.....	1.57
19N	Plastics synthetics.....	0.59	7L	Real estate, rentals.....	1.57
26N	Glass.....	0.81	2N	Other agriculture.....	1.65
16N	Paper.....	0.83	11L	Amusements.....	1.66
17N	Paperboard containers.....	0.93	10N	Apparel.....	1.66
9N	Miscellaneous textiles, rugs.....	0.97	6N	Food and kindred products.....	1.66
14L	Government enterprises.....	0.98	1N	Livestock.....	1.67
5N	Coal mining.....	0.98	7N	Tobacco.....	1.76
			17L	Households ⁶	1.81
			4N	Agricultural services.....	2.14

¹ Each figure represents the change in output and employment in each industry as a percentage of total output and employment in that industry before the arms cut.

² Employment and its regional distribution is measured in each industry by labor earnings.

³ Compensation is assumed to consist of a uniform proportional increase in all components of nonmilitary final demand sufficiently large to maintain the aggregate employment in all sectors (consequently in all regions) taken together unchanged.

⁴ Source of data: Appendix tables A-6 and A-7.

⁵ Note that the local sectors which are dummy industries have been omitted from this ranking. N refers to National industry number, L to Local industry number.

⁶ Note that this percentage reflects the 1.81 percent increase in all consumption coefficients. It represents the change in employment of employees in households such as domestic help or babysitters.

2. Table 1 describes the impact of a postulated demilitarization of the final demand in terms of individual industries. The percentage figures show that of the 56 sectors listed,⁶ only 10 will experience a

⁶ Two local dummy sectors, 15L office supplies and 16L business travel and entertainment, are not included in this tabulation.

reduction in total output and employment; aircraft, ordnance, and, significantly, research and development will take large cuts of over 13 percent, while electronic equipment, nonferrous metals, and instruments will drop between 1.59 and 5.40 percent. Among the four other industries registering losses rather than gains is iron and steel, which with its token 0.04 percent cut barely maintains the traditional standing as an armament industry. Positive changes are on the other hand distributed more evenly and among a much larger number of industries.

Food products, other soft consumer goods, and services gain most, basic industries such as chemicals, petroleum products, and paper, least, printing and publishing, motor vehicles, and other branches of processing show intermediate gains a few points above and below 1 percent. The skewness of the entire distribution, specifically the bunched negative and widespread positive shifts reflect, of course, the contrast between the specialized nature of military demand and the broad product mix of the civilian.

3. The regional projection of the economic impact of disarmament is summarized in table 2. As can be seen from the percentage entries in 10 of the 19 regions employment can be expected to contract while in the other nine it will expand. The largest loss, -1.85 percent, will be experienced in California, the biggest gain, +1.54 percent, in the midwestern region comprising Minnesota and the two Dakotas.

TABLE 2.—Percentage change in output and employment by region after a compensated 20-percent cut in armament expenditures

Region number	Region	Total net change (percent)	Total gross increase (percent)	Total gross decrease (percent)
		(1)	(2)	(3)
19	California.....	-1.85	0.54	2.39
16	Colorado, New Mexico.....	-1.40	0.67	2.07
17	Arizona, Nevada, Utah.....	-1.35	0.69	2.04
9	Maryland, Virginia, Delaware, West Virginia, District of Columbia.....	-1.36	0.66	2.02
14	Texas.....	-1.00	0.73	1.73
18	Oregon, Washington.....	-0.81	0.91	1.72
12	Mississippi, Alabama.....	-0.73	0.89	1.62
8	Georgia, North and South Carolina.....	-0.57	1.02	1.59
10	Florida.....	-0.43	1.12	1.55
1	New England.....	-0.06	1.05	1.11
13	Arkansas, Louisiana, Oklahoma.....	0.21	1.26	1.05
7	Kansas, Iowa, Nebraska, Missouri.....	0.44	1.46	1.02
11	Kentucky, Tennessee.....	0.37	1.31	0.94
2	New York.....	0.66	1.44	0.78
3	New Jersey, Pennsylvania.....	0.53	1.26	0.73
15	Idaho, Montana, Wyoming.....	1.28	1.53	0.55
4	Michigan, Ohio.....	0.89	1.43	0.54
5	Indiana, Illinois, Wisconsin.....	0.93	1.46	0.53
6	Minnesota, North and South Dakota.....	1.54	1.96	0.42
	Total United States.....		1.16	1.16

Neither the shift from one industry to another, nor the move from one region to another, considered separately, measures the total magnitude of readjustments that will be required of the members of each regional labor force. Such a measure must take both into account, simultaneously. What is needed is a figure which shows what proportion of all men and women initially employed in all the different industries operating in a given region will lose their jobs and will have to look for new jobs in a different industry in the same region or

in another region; in the latter case, the jobs they find in another region might or might not be in the same industry in which they worked before.

The figures entered in column 3 of table 2, accordingly, show what proportion of all the wage and salary earners will receive discharge notices and will have to look for new jobs. To emphasize the importance of these figures, the sequence in which the 19 regions are listed on the table reflects the order of decreasing magnitude of these "gross displacement" rates.

California, again, is at the head of the procession with the highest rate of 2.39 percent, and Minnesota with North and South Dakota ranks lowest with only 0.42 percent. A comparison of entries in column 1 with those of column 3 reveal that one region can experience a larger expansion in the total level of employment than another, but at the same time be subject to a greater stress as measured by the gross displacement figure. According to the computations the New York State region, for example, would expand its total employed labor force by 0.66 percent while the corresponding figure for the Kentucky-Tennessee region is 0.37 percent. At the same time 0.78 percent of the original jobholders in New York would have to change their jobs as against 0.94 percent in Kentucky-Tennessee.

Employment agencies might be interested in the total number of new jobs created in a particular region, *i.e.*, in the sum total of the increases in employment figures of those industries expected to expand in each region. Expressed as percentages of total labor force initially employed in the region, these "gross job gains" figures are entered in column 2. Strictly speaking, they do not present us with any new information since by definition they can be obtained simply by adding pairwise the corresponding entries in column 1 and column 3.

The regional impacts of disarmament as summarized in table 2 are described graphically on chart 1. Each set of bars depicts the impact of the same hypothetical shift from military to non-military demand on the employment situation in one of the 19 regions. The total length of the bar extended downward from the horizontal baseline measures the gross job loss (described in col. 3 in table 2). The total length of a bar extended upward represents the corresponding gross gain in jobs (described in col. 2 of table 2). The solidly shaded section of the longer of the two bars shows the difference between their length; in other words, it measures the change in the total level of employment in a particular region. That change is negative when the solid bar extends below the horizontal line, and it is positive when it is above.

The geographic picture confirms the well-known fact that most of the resources serving directly or indirectly final military demand come from the western, southwestern and southeastern regions, while the Midwest, the Great Lakes region and the North Atlantic and New England States depend to a large extent on civilian demand. A cut in military expenditures, accompanied by an expansion of the nonmilitary bill of goods, thus will create more serious readjustment problems in the first than in the second group of regions.

IV. DATA AND METHODS OF COMPUTATION

1. The basic concern of this study was to determine the regional, combined with the industrial, effects of a reduction in armaments.

Table A-1 gives the industrial classification used. The aggregation of states into 19 regions was chosen to make the data collection and the computations of a manageable size, while maintaining sufficient detail to detect regional differences.

The "A" matrix consisted of a domestic-base 1958 80-order inter-industry coefficient matrix made available by the Office of Business Economics in November 1964 and aggregated to 60 sectors at the Harvard economic research project.⁷ New construction coefficients were removed from the endogenous sectors to form a final demand column. Row distributions of final demand were used to derive the final demand columns other than new construction and military.⁸

The next step was to estimate vector (m) of military final demands shown in table A-3. Since more specific data for the military final demand vector was unobtainable at the time this study was begun, the estimates for military final demand were developed working with adjusted control totals⁹ given for various sectors in military prime contracts¹⁰ and with the 1958 Federal Government vector itself. The military final demand vector was made so that military purchases from any industry did not exceed Federal Government spending for products of that industry. Whenever a degree of arbitrariness entered into the determination of components of military final demand the estimate was biased toward the metal industries.

All sectors with zero Federal Government final demand were assigned zero military final demand.¹¹ In the case of aircraft (36N) and ordnance (40N), the entire Federal Government final demand was put in the military final demand vector. For the remaining sectors, each item in military prime contracts which served as a control total for military purchases from a particular group of industries was distributed in the proportion the sectors were to one another in the total Federal Government bill of goods, or in the proportion that the Department of Defense payrolls were to other Federal Government payrolls.¹²

The three vectors of final demand are shown in tables A-2 and A-3.¹³ The next step (represented earlier as equation 3) was to establish the control total, μ , the aggregate level of direct and indirect labor earnings in 1958, which was to remain constant throughout the computations. This total included direct earnings in household, military, and nonhousehold civilian final demand categories, as well as the direct and indirect earnings received from the endogenous sectors. Earnings were defined to include wages and salaries and

⁷ The 60-sector classification is given in table A-1 distinguishing between national and local industries. A column of import coefficients also was obtained from the Department of Commerce for use in the calculations.

⁸ The row distributions are given in "The Interindustry Structure of the United States," *Survey of Current Business*, November 1964, table I, p. 21. The calculation of Household final demand is designated as vector (h), while the final demands of the Federal Government (other than military), State and local government, net inventory change gross private capital formation competitive imports exports, and new construction are referred to as a group called nonhousehold civilian vector (q). Refer to footnotes on table A-3.

⁹ The fiscal year was adjusted to a calendar year base; also, "Actions of less than \$10,000" were distributed proportionately over prime military contract figures. These adjusted figures were used as control totals in determining how much military spending there was within groups of industries.

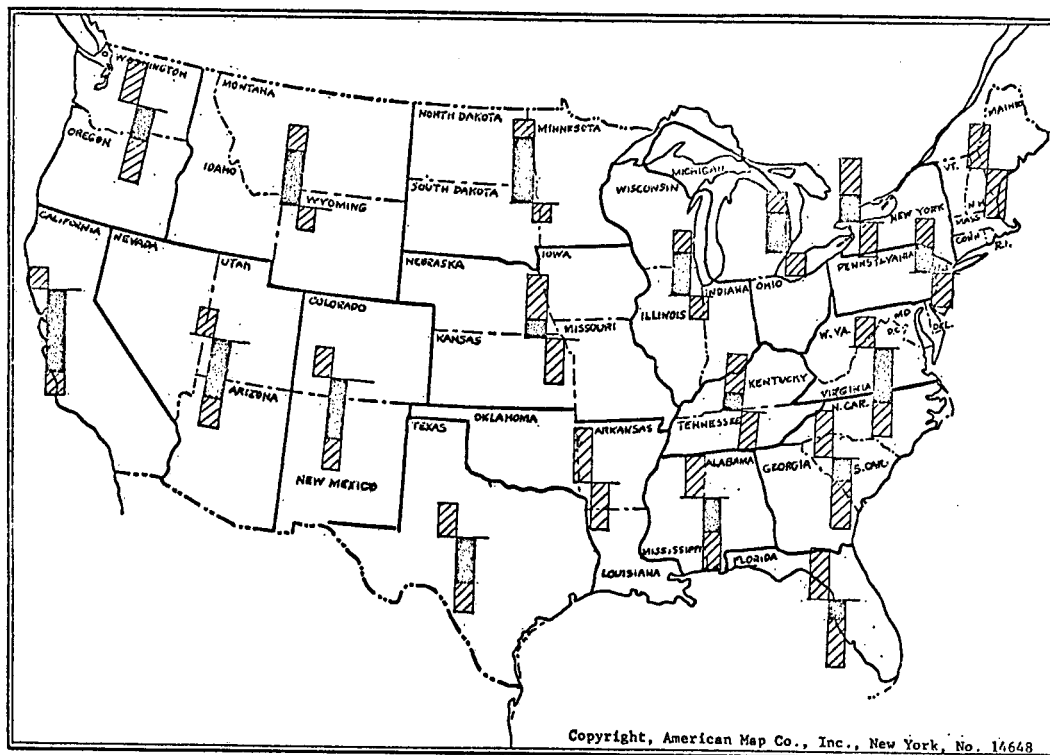
¹⁰ *Military Prime Contract Awards and Subcontract Payments*, July 1962-June 1963, Office of the Secretary of Defense, tables 6 and 7.

¹¹ These include: Livestock (1N), coal mining (5N), tobacco (7N), oilfields (22N), finance (6L). Forestry and fisheries (3N) and lumber (12N) had negative Federal Government final demands, but were assigned zero military final demand since it appeared that the military would not provide inputs to these industries. Crops (2N) also was assigned zero military final demand since the large entry for this sector in the total Federal Government vector represented operations of the Commodity Credit Corporation. Since sectors (1N), (2N), and (3N) now had zero elements in the military vector, agricultural services (4N) also was assumed to have zero military final demand.

¹² When it could be assumed that military and nonmilitary expenditures would parallel closely the number of workers in each sector.

¹³ Households was separated from the other final demands, because in the later calculations this sector would become endogenous.

CHART 1.—PERCENTAGE CHANGE IN OUTPUT AND EMPLOYMENT RESULTING FROM A HYPOTHETICAL 20 PER CENT CUT IN MILITARY SPENDING AND A COMPENSATING RISE IN CIVILIAN FINAL DEMAND



income of unincorporated enterprises, with a fixed markup of 20 percent in all but a few sectors to account for consumer expenditures by those with incomes from sources other than employment. Such an even markup does not affect the role of earnings as a measure of labor input.

Since ν was to remain constant, the drop in total labor earnings caused by the decrease in military spending had to be offset by an increase in the other components of final demand which would produce a compensating increase in labor earnings. The postulated value for α was 0.8; then using equation (4), β was determined to be approximately 1.02.¹⁴ Earlier, the output and labor earnings generated by the three components of final demand were calculated to determine what the requirements actually were in 1958 (referred to as before the shift); now, the new requirements associated with the new final demands (referred to as after the shift) were estimated. The next step was to calculate the regional distribution of labor earnings both before and after the shift.

By including households as an endogenous sector in the subsequent computations, the repercussion effect of household incomes and expenditures on the rest of the industries could be taken into account. Matrix A^* had to be constructed separately for the base year 1958 and for the situation after the level of living was increased by 1.81 percent as part of the compensation for the arms cut. In both cases, it was formed by adding a row of labor coefficients and a column of consumption coefficients.

The labor coefficients were obtained by dividing wages and salaries plus income of unincorporated enterprises, inflated by 20 percent, for each industry by output in that industry.¹⁵ The column of consumption coefficients for 1958 was obtained by dividing the deliveries from each industry to households (h) by the total amount of labor earnings for the country as a whole (ν).¹⁶ The elements of this column of consumption coefficients were multiplied by 1.81 to obtain the adjusted column. The new diagonal element of the labor coefficient row and the consumption coefficient column was obtained by dividing direct earnings in households, (ν_H), by the figure ν .

Then, the two new A^* matrices—one matrix containing the original consumption coefficients, the other the adjusted consumption coefficients—were partitioned into four submatrices by dividing all industries into two categories: National and local.¹⁷ In the classification used, there were 41 national industries and 17 local industries, including households.¹⁸

¹⁴ Therefore, a reduction of 20 percent in military expenditures was compensated by an approximate 2 percent increase in the household and nonhousehold civilian components of final demand.

¹⁵ See table A-2, col. 2. Sources for labor earnings are given in table A-10.

¹⁶ See table A-2, col. 1. Consumption coefficients after the shift can be obtained by multiplying each element of this column by 101.8 percent.

¹⁷ The division was based upon the data given in charts 17 and 19, pp. 144 and 146, of Wassily Leontief (Ed.), *Ibid.*, showing the proportion of the output of different industries which is consumed within a region and that which is exported for two types of regions: States and census divisions. A diagram of the partition is shown in sec. II.

¹⁸ See table A-1. Since business travel and entertainment and the office supply sectors are "dummy" sectors, their assignment to local industries is arbitrary.

2. The regional distribution of the output of national industries, X_N^R , was obtained by directly allocating the share of national output to a region in proportion to that region's share in the productive capacity of a particular industry.¹⁹ The change in labor earnings by region for national industries was determined by subtracting the regional distribution of outputs before the shift from the distribution of outputs after the shift and multiplying by the labor coefficients.²⁰

The first step in establishing the level of output of each local industry in each region was to distribute the final demand for local industries by regions. Military demand was distributed according to Department of Defense payrolls in each region. Nonhousehold civilian final demand was subdivided into its seven component bills of goods, each one was distributed according to a factor representing the importance of that final demand in a particular region, and the seven resulting matrices were added.²¹

Then, the output in each local industry in each region was obtained by inserting the appropriate matrices and vectors on the righthand side of equation (8). Outputs of local industries before the shift were subtracted from the outputs after the shift and the result was multiplied by the labor coefficients to give the change in labor earnings in local industries.²² The total change in labor earnings by regions, finally, was obtained by adding the change occurring in local industries in a region to that occurring in national industries and to that originating within the military and nonhousehold civilian sectors of the economy.²³

¹⁹ The sources for the P_N matrix, the distribution factors for national industries, are given in table A-11. The actual distribution factors used are shown in table A-5.

²⁰ See table A-6 which includes the change in dollar and in percentage terms. Only one column is needed to represent the percentage changes for national industries since total U.S. demand for the industry's product determines the output within a particular region.

²¹ The sources for the D_0 and D_M matrices, the distribution factors for local industries, are given in table A-12. Table A-4 contains the regionally distributed final demands.

²² See table A-7 for dollar and for percentage changes in local industries.

²³ See table A-9.

V. CONCLUDING OBSERVATIONS ON FURTHER RESEARCH

The same analytical scheme that permitted us to assess the economic implications of a hypothetical step toward disarmament, implemented by the same body of factual data, also can be used for evaluating the probable effect of specific measures of economic policies intended to mitigate the stresses of the transitional period. Such measures are usually designed to modify directly or indirectly the level, the composition and the regional distribution of the new civilian bill of goods. To assess their effect on the interindustrial and interregional distribution of outputs and employment, it will be necessary only to repeat the sequence of computations described above with these readjusted versions or the final bill of goods. Whenever information on specific military budget cuts becomes available, this information can replace the hypothetical assumption of the proportional 20-percent cut in military spending and the compensating 2-percent increase in civilian purchases.

The following two refinements can be introduced into the procedure described above without changing the analytical basis of the general approach. The admittedly rigid assumption that whenever the total output of a national good goes up or down, it increases or decreases in the same proportion in all regions can be relaxed. After completion of the three-stage computation described above, the new regional distribution of consumption of each national good can be determined and then compared with the old. Some regions will turn out to be increasing their relative shares at the expense of the others. Accordingly, the geographic distribution of the output can be expected to be affected by this, at least to some extent. If the demand for steel were to contract in a western but to expand in the eastern regions, the share of the latter in the total output of steel might be expected to increase somewhat and the share of the western mills to fall. To take account of this, a second round of multiregional input-output computations can be undertaken in which the set of the regional distribution coefficients applied to each of the national industries would be revised in the light of the numerical results of the first round.

The second refinement of the original procedure consists in breaking the regions into subregions.²⁴ The region, for example, which in the present computation includes Illinois, Indiana, and Wisconsin can be subdivided into two parts, one comprising Illinois and Indiana and the other—Wisconsin. The percentage figures describing the participation of these three States in the total production of each national good would have to be split into two separate figures. The output of the industries originally classified as local can be treated in two different ways. The regional outputs of some local goods might balance the demand not only for the three States together, but also separately, in each of the two subregions. That might be true of automobile repair services and retail trade. Other local goods, while not moving in sufficiently large amounts across the borders of the three-State region, still might be traded freely between its two parts. For such goods the distribution of the total regional output between the two subregions might be described better by a set of constant subregional coefficients. On the lower subregional level, these empirically determined coefficients would play a role analogous to that assigned to regional coefficients in determining the interregional distribution of the total output of each national good. Without elaborating the technical details of such a complicated analytical scheme, involving not one but several layers of regional breakdowns, it suffices to observe that while the successive rounds of such computations can be introduced one by one without modifying the results of the higher rounds, the overall results always will be internally consistent at every stage.

Finally, an entirely different nonlinear, multiregional input-output scheme was proposed several years ago.²⁵ It is being tested now in the United States, in Latin America, and also in Europe. All of these interregional input-output schemes require detailed regional information which is not always available.

Thus, highest priority should be assigned to improvement of the basic data. For statistics which are collected on a national level, a systematic, regional breakdown becomes more and more important. On the other hand, most data collected by local and State organizations—often in connection with various programs of regional economic development—are limited in their usefulness because of lack of comparability with other regional and national statistics. This needs to be remedied by agreement on and compliance with certain common classifications and standards.

²⁴ See Wassily Leontief (Ed.), *Ibid.*, ch. 4.

²⁵ Wassily Leontief and Alan Strout, "Multiregional and Input-Output Analysis," Tibor Barna (Ed.) *Structural Interdependence and Economic Development*, (Macmillan: London, 1963), ch. 7.

APPENDIX TABLES

TABLE A-1.—Industrial classification scheme

PART I

National industry	Office of Business Economics 80-order sector ¹	National industries
1N	1	Livestock.
2N	2	Other agriculture.
3N	3	Forestry and fisheries.
4N	4	Agricultural services.
5N	7	Coal mining.
6N	14	Food.
7N	15	Tobacco.
8N	16	Fabrics, yarn.
9N	17	Rugs, miscellaneous textiles.
10N	18	Apparel.
11N	19	Miscellaneous fabricated textile products.
12N	20	Lumber and wood products.
13N	21	Wooden containers.
14N	22	Household furniture.
15N	23	Office furniture.
16N	24	Paper.
17N	25	Paperboard containers.
18N	10, 27	Chemicals.
19N	28	Plastics, synthetics.
20N	29	Drugs.
21N	30	Paint.
22N	8	Oil fields.
23N	31	Petroleum products.
24N	32	Rubber.
25N	33, 34	Leather.
26N	35	Glass.
27N	9, 36	Stone and clay.
28N	5, 37	Iron and steel.
29N	6, 38	Nonferrous metals.
30N	39-42	Fabricated metals.
31N	43-52	Nonelectrical machinery.
32N	53, 58	Electrical apparatus.
33N	54, 55	Appliances and lighting equipment.
34N	56, 57	Communications and electronic equipment.
35N	59	Motor vehicles
36N	60	Aircraft.
37N	61	Other transportation equipment.
38N	62, 63	Instruments.
39N	64	Miscellaneous manufacturing.
40N	13	Ordnance.
41N	74	Research and development.

PART II

Local industry	Office of Business Economics 80-order sector ¹	Local industries
1L	26	Printing and publishing.
2L	68	Electricity, gas, water.
3L	65	Transportation, warehousing.
4L	69	Trade.
5L	66, 67	Communications.
6L	70	Finance, insurance.
7L	71	Real estate and rentals.
8L	72	Personal and repair services, hotels.
9L	75	Auto repair services.
10L	73	Business services.
11L	76	Amusements.
12L	77	Medical and educational services.
13L	12	Maintenance construction.
14L	78, 79	Government enterprises.
15L	82	Office supplies.
16L	81	Business travel, entertainment.
17L	-----	Houesholds.

¹ Classification for Office of Business Economics 80-Order Sector is taken from: "The Interindustry Structure of the United States," *Survey of Current Business*, November 1964.

TABLE A-2.—Consumption and labor coefficients for national industries

PART I

National industry	Classification	Consumption coefficient ¹	Labor coefficient ²
1N	Livestock.....	0.0065	*.3050
2N	Other agriculture.....	.0076	0.2926
3N	Forestry and fisheries.....	.0079	*.3437
4N	Agricultural services.....	.....	*.3115
5N	Coal mining.....	.0008	.4405
6N	Food.....	.1423	.1562
7N	Tobacco.....	.0133	.0691
8N	Fabrics, yarn.....	.0022	.2221
9N	Rugs, miscellaneous textiles.....	.0024	.2252
10N	Apparel.....	.0347	.3441
11N	Miscellaneous fabricated textile products.....	.0035	.2266
12N	Lumber and wood products.....	.0005	.3211
13N	Wooden containers.....	.....	.3358
14N	Household furniture.....	.0075	.3511
15N	Office furniture.....	.0004	.4101
16N	Paper.....	.0027	.2609
17N	Paperboard containers.....	.0001	.2928
18N	Chemicals.....	.0007	.2484
19N	Plastics, synthetics.....	.0000	.2270
20N	Drugs.....	.0116	.2043
21N	Paint.....	.0001	.2427
22N	Oil fields.....	.....	.2122
23N	Petroleum products.....	.0226	.1142
24N	Rubber.....	.0040	.3142
25N	Leather.....	.0081	.3648
26N	Glass.....	.0004	.4028
27N	Stone and clay.....	.0007	.3454
28N	Iron and steel.....	.0001	.3128
29N	Nonferrous metals.....	.0000	.2300
30N	Fabricated metals.....	.0022	.3490
31N	Nonelectrical machinery.....	.0015	.3902
32N	Electrical apparatus.....	.0009	.3877
33N	Appliances and lighting equipment.....	.0086	.2903
34N	Communications and electronic equipment.....	.0047	.3699
35N	Motor vehicles.....	.0286	.1865
36N	Aircraft.....	.0001	*.4136
37N	Other transportation equipment.....	.0023	.3868
38N	Instruments.....	.0025	.3928
39N	Miscellaneous manufacturing.....	.0079	.3447
40N	Ordnance.....	.0005	*.2972
41N	Research and development.....	.....	.0568

PART II—LOCAL INDUSTRIES

Local industry	Classification	Coefficient ¹ consumption	Labor coefficient ²
1L	Printing and publishing.....	0.0076	0.4624
2L	Electricity, gas, water.....	.0251	.1979
3L	Transportation, warehousing.....	.0262	.5181
4L	Trade.....	.1900	.6152
5L	Communications.....	.0134	.4315
6L	Finance, insurance.....	.0365	.4891
7L	Real estate and rentals.....	.1242	.0516
8L	Personal and repair services, hotels.....	.0294	.6003
9L	Auto repair services.....	.0136	.1966
10L	Business services.....	.0058	.3975
11L	Amusements.....	.0102	.3590
12L	Medical and educational services.....	.0634	*.6131
13L	Maintenance construction.....	.....	.3049
14L	Government enterprises.....	.0029	*.4488
15L	Office supplies.....	.....	.....
16L	Business travel, entertainment.....	.....	.....
17L	Households.....	.0108	*.0108

¹ Column vector of personal consumption expenditure coefficients which became endogenous for the last part of computations. Consumption coefficients obtained from row distribution of final demands: "The Interindustry Structure of the United States," Survey of Current Business, November 1964, Table I, p. 21.

² Row vector of labor input coefficients after adjusting for interest and dividends. Those marked with * were not adjusted for interest and dividends. Those marked ** had special calculations made for interest and dividends. Labor coefficients: sources used to obtain uninflated coefficients are given in Table A-10.

TABLE A-3.—Final demands for National industries

PART I

National industry No.	National industries	Military ¹ (millions of dollars)	Non-household civilian ² (millions of dollars)
1N	Livestock.....		396.4
2N	Other agriculture.....		3,170.3
3N	Forestry and fisheries.....		-393.0
4N	Agricultural services.....		
5N	Coal mining.....		367.0
6N	Food.....	132.2	389.9
7N	Tobacco.....		383.7
8N	Fabrics, yarn.....	54.3	-147.7
9N	Rugs, miscellaneous textiles.....	5.0	-250.4
10N	Apparel.....	42.8	66.4
11N	Miscellaneous fabricated textile products.....	103.7	10.6
12N	Lumber and wood products.....		2,019.5
13N	Wooden containers.....	1.2	-11.3
14N	Household furniture.....	17.7	493.3
15N	Office furniture.....	15.1	1,161.4
16N	Paper.....	43.6	-378.5
17N	Paperboard containers.....	2.1	15.6
18N	Chemicals.....	294.0	1,353.3
19N	Plastics, synthetics.....	2.8	256.8
20N	Drugs.....	90.4	556.1
21N	Paint.....	1.7	218.6
22N	Oil fields.....		-1,208.0
23N	Petroleum.....	604.9	1,222.5
24N	Rubber.....	78.8	621.2
25N	Leather.....	21.7	51.2
26N	Glass.....	1.9	86.5
27N	Stone and clay.....	15.2	4,618.4
28N	Iron and steel.....	46.8	1,950.4
29N	Nonferrous metals.....	213.6	237.0
30N	Fabricated metals.....	89.5	7,396.6
31N	Nonelectrical machinery.....	421.9	12,975.5
32N	Electrical apparatus.....	224.8	2,314.3
33N	Appliances and lighting equipment.....	33.7	1,253.0
34N	Communications and electronic equipment.....	1,363.8	1,532.0
35N	Motor vehicles.....	122.8	3,920.0
36N	Aircraft.....	6,438.4	589.7
37N	Other transportation equipment.....	264.1	1,776.6
38N	Instruments.....	277.2	1,478.0
39N	Miscellaneous manufacturing.....	22.6	449.2
40N	Ordnance.....	2,263.0	100.0
41N	Research and development.....	3,643.7	1,496.3

PART II—FINAL DEMAND FOR LOCAL INDUSTRIES

Local industry No.	Local industries	Military ¹ (millions of dollars)	Non-household civilian ² (millions of dollars)
1L	Printing and publishing.....	52.5	282.2
2L	Electricity, gas, water.....	50.8	933.9
3L	Transportation, warehousing.....	1,037.7	5,414.7
4L	Trade.....	493.2	11,129.8
5L	Communications.....	27.1	947.3
6L	Finance, insurance.....		689.2
7L	Real estate and rentals.....	18.2	2,043.9
8L	Personal and repair services, hotels.....	35.8	291.9
9L	Auto repair services.....	18.6	448.6
10L	Business services.....	82.4	3,749.5
11L	Amusements.....	2.5	251.6
12L	Medical and educational services.....	95.1	391.3
13L	Maintenance construction.....	936.5	349.4
14L	Government enterprises.....	101.4	218.6
15L	Office supplies.....	43.2	172.0
16L	Business travel, entertainment.....		62.1
17L	Households.....	11,198.0	47,695.0
	Total all industries (national and local).....	31,258.0	131,647.8

¹ When this study was begun, specific data was not available for the military final demand vector; therefore, the dollar amounts are estimates developed from adjusted control totals given for various sectors in military Prime Contract Awards and Subcontract Payments, July 1962-June 1963, Office of the Secretary of Defense, tables 6 and 7. The vector only includes estimates of final purchases from industries defined as endogenous for this study. Purchases by the military on prime contracts differ from military purchases defined by the Office of Business Economics. Some of these differences are explained in Hearings Before the Subcommittee on Defense Procurement of the Joint Economic Committee, Congress of the United States, June 12, 1961, "Progress Made by the Department of Defense in Reducing the Impact of Military Procurement on the Economy," p. 141 and in the source cited above, p. 48.

² Row distributions of final demand were used to derive the final demand columns other than new construction and military. "The Interindustry Structure of the United States, . . ." Survey of Current Business, November 1964, table 1, p. 21. Only the percentage distributions were released by the Office of Business Economics at the time this paper was written. The vector presented above includes new construction, but excludes military and household final demands. The vector also only includes final purchases from the 57 industries defined as endogenous for this study.

TABLE A-4.—Demand for outputs of local industries

PART I—MILITARY FINAL

[Millions of dollars]

Local Industry	Region									
	(1) New England	(2) New York	(3) New Jersey, Pennsyl- vania	(4) Michigan, Ohio	(5) Indiana, Illinois, Wisconsin	(6) Minnesota, South Dakota, North Dakota	(7) Iowa, Missouri, Nebraska, Kansas	(8) Georgia, North Carolina, South Carolina	(9) Virginia, West Virginia, Maryland, District of Columbia, Delaware	(10) Florida
1. Printing, publishing.....	3	2	4	2	2	0	2	5	7	2
2. Electricity, gas, water.....	3	2	3	2	2	0	2	5	7	2
3. Transportation, warehousing.....	53	44	71	36	44	8	44	97	140	37
4. Trade.....	25	21	34	18	21	4	21	46	67	18
5. Communications.....	1	1	2	1	1	0	1	3	4	1
6. Finance, insurance.....	0	0	0	0	0	0	0	0	0	0
7. Real estate, rentals.....	1	1	1	1	1	0	1	2	2	1
8. Repair services, hotels.....	2	2	2	1	2	0	2	3	5	1
9. Auto repair services.....	1	1	1	1	1	0	1	2	3	1
10. Business services.....	4	4	6	3	3	1	4	8	11	3
11. Amusements.....	0	0	0	0	0	1	0	0	0	0
12. Medical, educational services.....	5	4	7	4	4	1	4	9	13	3
13. Maintenance construction.....	48	40	64	35	40	7	40	88	126	34
14. Government enterprises.....	5	4	7	4	4	1	4	10	14	4
15. Office supplies.....	2	2	3	2	2	0	2	4	6	2
16. Business travel.....	0	0	0	0	0	0	0	0	0	0
17. Households.....	571	477	769	413	474	86	478	1,052	1,512	404
Region total.....	724	605	974	523	600	109	600	1,333	1,916	512

Local industry	Region									U.S. total
	(11) Tennessee, Kentucky	(12) Alabama, Mississippi	(13) Oklahoma, Louisiana, Arkansas	(14) Texas	(15) Montana, Wyoming, Idaho	(16) Colorado, New Mexico	(17) Arizona, Nevada, Utah	(18) Oregon, Washing- ton	(19) California	
1. Printing, publishing.....	2	2	2	5	0	2	1	2	8	52
2. Electricity, gas, water.....	2	2	2	4	0	2	1	2	7	51
3. Transportation, warehousing.....	33	41	43	92	6	33	27	36	149	1,038
4. Trade.....	16	19	21	44	3	16	13	17	71	493
5. Communications.....	1	1	1	2	0	1	1	1	4	27
6. Finance, insurance.....	0	0	0	0	0	0	0	0	0	0
7. Real estate, rentals.....	1	1	1	2	0	1	0	1	3	18
8. Repair services, hotels.....	1	1	1	3	0	1	1	1	5	36
9. Auto repair services.....	1	1	1	2	0	1	0	1	3	19
10. Business services.....	3	3	3	7	0	3	2	3	12	82
11. Amusements.....	0	0	0	0	0	0	0	0	0	2
12. Medical, educational services.....	3	4	4	8	1	3	2	3	14	95
13. Maintenance construction.....	30	37	39	83	6	30	24	32	135	936
14. Government enterprises.....	3	4	4	9	1	3	3	3	15	101
15. Office supplies.....	1	2	2	4	0	1	1	1	6	43
16. Business travel.....	0	0	0	0	0	0	0	0	0	0
17. Households.....	353	439	466	991	67	361	288	385	1,613	11,198
Region total.....	447	557	591	1,257	85	467	365	488	2,044	14,193

TABLE A-4.—Demand for outputs of local industries—Continued

PART II—NONHOUSEHOLD CIVILIAN

Local industry	Region									
	(1) New England	(2) New York	(3) New Jersey, Pennsyl- vania	(4) Michigan, Ohio	(5) Indiana, Illinois, Wisconsin	(6) Minnesota, South Dakota, North Dakota	(7) Iowa, Missouri, Nebraska, Kansas	(8) Georgia, North Carolina, South Carolina	(9) Virginia, West Virginia, Maryland, District of Columbia, Delaware	(10) Florida
1 Printing, publishing.....	23	48	32	31	39	9	20	19	32	10
2 Electricity, gas, water.....	60	109	86	89	96	25	53	44	102	29
3 Transportation, warehousing.....	390	816	705	583	682	133	360	390	607	230
4 Trade.....	710	1,187	1,296	1,263	1,464	242	577	518	754	323
5 Communications.....	59	98	105	105	117	19	45	42	78	22
6 Finance, insurance.....	41	80	66	69	79	18	34	25	37	22
7 Real estate, rentals.....	121	182	243	245	273	38	99	92	126	42
8 Repair services, hotels.....	21	33	28	26	28	8	18	17	53	10
9 Auto repair services.....	28	51	43	42	49	11	24	19	44	16
10 Business services.....	227	452	357	356	421	94	190	142	290	128
11 Amusements.....	9	52	14	18	19	3	8	4	12	6
12 Medical, education services.....	33	52	47	46	49	12	29	34	48	17
13 Maintenance construction.....	301	516	427	426	440	112	266	321	445	154
14 Government enterprises.....	24	35	30	26	29	8	20	27	55	12
15 Office supplies.....	15	24	21	20	21	5	13	15	24	8
16 Business travel.....	2	3	3	3	7	2	3	1	3	5
17 Households.....	3,954	6,401	5,721	5,316	5,887	1,406	3,398	3,859	6,778	2,204
Regional total.....	6,017	10,143	9,224	8,664	9,699	2,144	5,161	5,568	9,489	3,239

Local industry	Region									U.S. total
	(11) Tennessee, Kentucky	(12) Alabama, Mississippi	1 (3) Oklahoma, Louisiana, Arkansas	(14) Texas	(15) Montana, Wyoming, Idaho	(16) Colorado, New Mexico	(17) Arizona, Nevada, Utah	(18) Oregon, Washing- ton	(19) California	
1. Printing, publishing.....	10	9	13	20	3	7	6	11	46	388
2. Electricity, gas, water.....	28	22	38	50	11	21	18	33	125	1,039
3. Transportation, warehousing.....	188	170	288	461	58	153	130	236	914	7,494
4. Trade.....	300	255	393	669	104	190	182	362	1,329	12,118
5. Communications.....	27	22	33	54	8	14	13	31	106	1,003
6. Finance, insurance.....	16	12	23	31	8	13	12	20	84	689
7. Real estate, rentals.....	58	49	69	121	15	24	22	64	198	2,082
8. Repair services, hotels.....	11	8	13	18	4	8	6	12	44	366
9. Auto repair services.....	12	10	17	23	5	10	9	15	60	487
10. Business services.....	91	71	132	179	43	77	72	116	482	3,920
11. Amusements.....	4	1	4	6	1	4	12	4	77	257
12. Medical, educational services.....	16	15	22	34	5	13	11	19	75	582
13. Maintenance construction.....	149	144	201	323	48	120	101	177	697	5,368
14. Government enterprises.....	13	12	16	27	4	11	9	14	52	422
15. Office supplies.....	7	7	10	15	2	6	5	8	33	259
16. Business travel.....	1	1	3	3	2	2	3	2	11	62
17. Households.....	1,908	1,778	2,597	4,077	668	1,610	1,386	2,247	9,009	70,202
Region total.....	2,840	2,586	3,872	6,112	989	2,282	1,998	3,370	13,341	106,739

TABLE A-5.—Distribution factors and total outputs of national industries ¹

[Fraction of industry total]

National industry	Region									
	(1) New England	(2) New York	(3) New Jersey, Pennsylvania	(4) Michigan, Ohio	(5) Indiana, Illinois, Wisconsin	(6) Minnesota, South Dakota, North Dakota	(7) Iowa, Missouri, Nebraska, Kansas	(8) Georgia, North Carolina, South Carolina	(9) Virginia, West Virginia, Maryland, District of Columbia, Delaware	(10) Florida
1. Livestock.....	0.027	0.032	0.041	0.054	0.158	0.092	0.217	0.043	0.032	0.010
2. Other agriculture.....	0.106	0.016	0.021	0.046	0.087	0.069	0.134	0.087	0.023	0.035
3. Forestry, fisheries.....	0.182	0.023	0.030	0.010	0.008	0.005	0.001	0.053	0.121	0.084
4. Agricultural services.....	0.083	0.097	0.099	0.088	0.069	0.030	0.050	0.039	0.052	0.037
5. Coal mining.....	0.001	0.	0.279	0.054	0.089	0.	0.010	0.	0.365	0.
6. Food, kindred products.....	0.047	0.095	0.107	0.092	0.154	0.039	0.098	0.036	0.043	0.017
7. Tobacco.....	0.008	0.006	0.152	0.016	0.001	0.	0.	0.390	0.190	0.073
8. Fabrics, yarn.....	0.177	0.037	0.104	0.004	0.006	0.001	0.000	0.538	0.048	0.
9. Miscellaneous textiles, rugs.....	0.207	0.084	0.201	0.073	0.081	0.005	0.008	0.189	0.056	0.001
10. Apparel.....	0.070	0.325	0.190	0.022	0.051	0.007	0.027	0.103	0.040	0.005
11. Miscellaneous fabricated textile products.....	0.076	0.279	0.149	0.109	0.080	0.012	0.036	0.068	0.034	0.006
12. Lumber, wood products.....	0.049	0.032	0.028	0.036	0.070	0.016	0.023	0.077	0.041	0.016
13. Wooden containers.....	0.069	0.037	0.061	0.070	0.102	0.013	0.022	0.116	0.056	0.046
14. Household furniture.....	0.096	0.096	0.089	0.077	0.163	0.008	0.026	0.148	0.061	0.020
15. Office furniture.....	0.040	0.161	0.104	0.229	0.162	0.010	0.043	0.035	0.045	0.011
16. Paper.....	0.145	0.101	0.102	0.117	0.136	0.025	0.018	0.065	0.035	0.028
17. Paperboard containers.....	0.087	0.143	0.159	0.128	0.166	0.013	0.049	0.050	0.042	0.012
18. Chemicals.....	0.026	0.068	0.156	0.128	0.075	0.005	0.046	0.041	0.109	0.014
19. Plastics, synthetics.....	0.050	0.047	0.139	0.088	0.021	0.006	0.009	0.097	0.234	0.052
20. Drugs.....	0.048	0.171	0.237	0.112	0.214	0.010	0.054	0.028	0.035	0.002
21. Paints.....	0.036	0.072	0.216	0.174	0.189	0.013	0.053	0.026	0.023	0.008
22. Oil fields.....	0.	0.004	0.014	0.017	0.027	0.005	0.041	0.	0.011	0.000
23. Petroleum products.....	0.012	0.017	0.159	0.062	0.140	0.007	0.039	0.004	0.010	0.003
24. Rubber, miscellaneous plastics.....	0.164	0.066	0.121	0.286	0.140	0.005	0.029	0.009	0.033	0.001
25. Leather.....	0.325	0.172	0.126	0.046	0.121	0.	0.087	0.012	0.027	0.002
26. Glass.....	0.009	0.149	0.233	0.174	0.139	0.	0.002	0.037	0.113	0.017
27. Stone and clay.....	0.055	0.062	0.148	0.142	0.129	0.022	0.067	0.036	0.054	0.025
28. Iron and steel.....	0.025	0.052	0.205	0.221	0.197	0.019	0.014	0.004	0.068	0.000
29. Nonferrous, metals.....	0.108	0.080	0.154	0.136	0.140	0.009	0.016	0.006	0.044	0.004
30. Fabricated metals.....	0.084	0.080	0.162	0.119	0.196	0.012	0.039	0.011	0.030	0.011
31. Nonelectrical machinery.....	0.106	0.105	0.127	0.229	0.220	0.007	0.045	0.012	0.014	0.002
32. Electrical apparatus.....	0.084	0.118	0.183	0.180	0.242	0.011	0.041	0.014	0.020	0.005
33. Appliances, lighting equipment.....	0.091	0.083	0.128	0.221	0.244	0.012	0.041	0.003	0.019	0.001

34. Electronics equipment.....	0.110	0.153	0.216	0.036	0.252	0.006	0.023	0.022	0.034	0.005
35. Motor vehicles.....	0.009	0.060	0.060	0.569	0.167	0.004	0.037	0.017	0.017	0.001
36. Aircraft.....	0.082	0.076	0.049	0.098	0.049	0.005	0.089	0.019	0.035	0.002
37. Other transportation equipment.....	0.132	0.061	0.161	0.069	0.119	0.008	0.020	0.009	0.136	0.026
38. Instruments.....	0.128	0.320	0.174	0.061	0.147	0.013	0.015	0.003	0.013	0.002
39. Miscellaneous manufacturing.....	0.181	0.228	0.142	0.106	0.129	0.007	0.037	0.042	0.003	0.006
40. Ordnance.....	0.075	0.150	0.038	0.062	0.038	0.026	0.042	0.007	0.044	0.018
41. Research and development.....	0.062	0.108	0.059	0.031	0.121	0.017	0.011	0.007	0.164	0.014

¹ In all tables an entry of zero followed only by a decimal indicates the cell is empty. An entry consisting entirely of zeros, with no blank space, indicates the cell contains a figure of negligible size.

TABLE A-5.—Distribution factors and total outputs of national industries ¹—Continued

National industry	Region									U.S. total outputs ²
	(11) Tennessee, Kentucky	(12) Alabama, Mississippi	(13) Oklahoma, Louisiana, Arkansas	(14) Texas	(15) Montana, Wyoming, Idaho	(16) Colorado, New Mexico	(17) Arizona, Nevada, Utah	(18) Oregon Washing- ton	(19) California	
1 Livestock.....	0.030	0.029	0.037	0.048	0.029	0.025	0.018	0.021	0.056	26,026.6
2 Other agriculture.....	0.033	0.033	0.062	0.102	0.031	0.022	0.022	0.040	0.123	22,983.5
3 Forestry, fisheries.....	0.004	0.034	0.066	0.090	0.004	0.001	0.001	0.120	0.166	1,140.3
4 Agricultural services.....	0.024	0.018	0.035	0.030	0.006	0.014	0.016	0.025	0.188	1,647.3
5 Coal mining.....	0.032	0.036	0.006	0.	0.003	0.010	0.016	0.001	0.	2,741.1
6 Food, kindred products.....	0.032	0.015	0.029	0.038	0.007	0.012	0.009	0.027	0.102	63,695.8
7 Tobacco.....	0.159	0.005	0.	0.	0.	0.	0.	0.	0.000	5,921.9
8 Fabrics, yarn.....	0.019	0.050	0.003	0.009	0.	0.	0.	0.003	0.001	10,595.9
9 Miscellaneous textiles, rugs.....	0.020	0.024	0.006	0.007	0.	0.	0.	0.	0.036	2,180.7
10 Apparel.....	0.046	0.031	0.010	0.021	0.	0.001	0.002	0.005	0.043	14,219.1
11 Miscellaneous fabricated textile products.....	0.020	0.015	0.008	0.023	0.	0.002	0.002	0.015	0.067	2,288.0
12 Lumber, wood products.....	0.030	0.046	0.053	0.023	0.043	0.008	0.009	0.275	0.124	7,884.2
13 Wooden containers.....	0.085	0.068	0.031	0.034	0.	0.003	0.	0.056	0.122	442.3
14 Household furniture.....	0.055	0.024	0.026	0.024	0.	0.003	0.004	0.018	0.099	3,271.6
15 Office furniture.....	0.008	0.004	0.009	0.032	0.001	0.007	0.004	0.009	0.086	1,496.2
16 Paper.....	0.019	0.046	0.050	0.020	0.	0.001	0.	0.057	0.033	9,478.7
17 Paperboard containers.....	0.018	0.003	0.022	0.015	0.	0.003	0.001	0.014	0.077	3,628.5
18 Chemicals.....	0.066	0.015	0.054	0.015	0.003	0.014	0.001	0.038	0.035	12,048.8
19 Plastics, synthetics.....	0.181	0.	0.016	0.048	0.	0.	0.	0.	0.012	4,216.3
20 Drugs.....	0.011	0.004	0.000	0.010	0.	0.001	0.	0.001	0.061	6,605.7
21 Paints.....	0.033	0.004	0.005	0.032	0.	0.006	0.	0.009	0.100	1,866.5
22 Oil fields.....	0.010	0.015	0.262	0.421	0.029	0.048	0.007	0.001	0.089	9,611.2
23 Petroleum products.....	0.006	0.003	0.127	0.250	0.020	0.008	0.006	0.010	0.118	17,268.7
24 Rubber, miscellaneous plastics.....	0.014	0.019	0.008	0.013	0.	0.019	0.001	0.	0.072	6,810.8
25 Leather.....	0.034	0.	0.008	0.008	0.000	0.008	0.000	0.002	0.020	3,967.8
26 Glass.....	0.012	0.012	0.017	0.014	0.	0.	0.	0.019	0.052	2,136.6
27 Stone and clay.....	0.033	0.019	0.036	0.039	0.003	0.014	0.015	0.016	0.087	8,825.6
28 Iron and steel.....	0.013	0.041	0.002	0.018	0.001	0.012	0.011	0.005	0.035	19,860.4
29 Nonferrous metals.....	0.002	0.002	0.026	0.027	0.039	0.026	0.080	0.039	0.060	10,171.0
30 Fabricated metals.....	0.023	0.013	0.015	0.025	0.001	0.004	0.004	0.012	0.087	19,904.0
31 Nonelectrical machinery.....	0.014	0.004	0.009	0.026	0.001	0.004	0.004	0.007	0.064	23,872.7
32 Electrical apparatus.....	0.005	0.003	0.003	0.006	0.	0.004	0.000	0.008	0.073	6,660.8
33 Appliances, lighting equipment.....	0.076	0.006	0.004	0.001	0.	0.000	0.	0.004	0.066	5,894.0
34 Electronics equipment.....	0.009	0.005	0.004	0.015	0.	0.001	0.007	0.001	0.102	8,607.6
35 Motor vehicles.....	0.009	0.004	0.002	0.010	0.	0.001	0.000	0.004	0.040	22,732.0
36 Aircraft.....	0.001	0.013	0.011	0.065	0.	0.002	0.009	0.083	0.311	12,646.5
37 Other transportation equipment.....	0.009	0.067	0.034	0.033	0.001	0.001	0.001	0.041	0.073	3,721.2

38 Instruments.....	0.008	0.000	0.004	0.013	0.	0.002	0.002	0.002	0.065	4,988.7
39 Miscellaneous manufacturing.....	0.014	0.010	0.010	0.004	0.001	0.013	0.005	0.008	0.053	5,291.9
40 Ordnance.....	0.013	0.001	0.	0.014	0.	0.051	0.023	0.	0.405	4,641.8
41 Research and development.....	0.062	0.012	0.010	0.020	0.002	0.026	0.002	0.007	0.277	5,301.8

² These gross domestic output figures were estimated before the 1958 transactions matrix was released by the Office of Business Economics and are expected to vary somewhat from the OBE output figures.

TABLE A-6.—Change in labor earnings in national industries

[Millions of dollars]

National Industry	Region											
	(1) New England	(2) New York	(3) New Jersey, Pennsyl- vania	(4) Michigan, Ohio	(5) Indiana, Illinois, Wis- consin	(6) Minne- sota, South Dakota, North Dakota	(7) Iowa, Missouri, Ne- braska, Kansas	(8) Georgia, North Carolina, South Carolina	(9) Virginia, West Virginia, Mary- land, District of Col- umbia, Delaware	(10) Florida	(11) Tennes- see, Ken- tucky	(12) Alabama, Missis- sippi
1. Livestock.....	3.6	4.3	5.5	7.2	21.0	12.2	28.8	5.8	4.2	1.3	3.9	3.8
2. Other agriculture.....	1.8	1.8	2.4	5.1	9.7	7.6	14.9	9.6	2.6	3.9	3.7	3.7
3. Forestry, fisheries.....	0.9	0.1	0.2	0.1	0.0	0.0	0.0	0.3	0.6	0.4	0.0	0.2
4. Agricultural services.....	0.9	1.0	1.0	0.9	0.7	0.3	0.5	0.4	0.5	0.4	0.2	0.2
5. Coal mining.....	0.0	0.	3.3	0.6	1.1	0.	0.1	0.	4.3	0.	1.6	0.4
6. Food, kindred products.....	7.8	15.7	17.8	15.2	25.5	6.5	16.2	5.9	7.2	2.9	5.2	2.4
7. Tobacco.....	0.1	0.0	1.1	0.1	0.0	0.	0.	2.8	1.4	0.5	1.1	0.0
8. Fabrics, yard.....	5.0	1.0	2.9	0.1	0.2	0.0	0.0	15.1	1.3	0.	0.5	1.4
9. Miscellaneous textiles, rugs.....	1.0	0.4	1.0	0.4	0.4	0.0	0.0	0.9	0.3	0.0	0.1	0.1
10. Apparel.....	5.7	26.5	15.4	1.8	4.2	0.5	2.2	8.4	3.3	0.4	3.7	2.5
11. Miscellaneous fabricated textile products.....	0.2	0.8	0.4	0.3	0.2	0.0	0.1	0.2	0.1	0.0	0.1	0.0
12. Lumber, wood products.....	1.5	1.0	0.9	1.1	2.2	0.5	0.7	2.4	1.3	0.5	1.0	1.5
13. Wooden containers.....	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.2	0.1	0.1	0.1	0.1
14. Household furniture.....	0.9	1.4	1.3	1.1	2.4	0.1	0.4	2.2	0.9	0.3	0.8	0.4
15. Office furniture.....	0.3	1.2	0.8	1.7	1.2	0.1	0.3	0.3	0.3	0.1	0.1	0.0
16. Paper.....	3.0	2.1	2.1	2.4	2.8	0.5	0.4	1.3	0.7	0.6	0.4	0.9
17. Paperboard containers.....	0.9	1.4	1.6	1.3	1.6	0.1	0.5	0.5	0.4	0.1	0.2	0.0
18. Chemicals.....	0.1	0.3	0.7	0.6	0.3	0.0	0.2	0.2	0.5	0.1	0.3	0.1
19. Plastics, synthetics.....	0.3	2.8	0.8	0.5	0.1	0.0	0.1	0.5	1.3	0.3	1.0	0.
20. Drugs.....	0.8	0.1	3.9	1.8	3.5	0.2	0.9	0.5	0.6	0.0	0.2	0.1
21. Paints.....	0.1	0.2	0.5	0.4	0.4	0.0	0.1	0.1	0.1	0.0	0.1	0.0
22. Oil fields.....	0.	0.0	0.1	0.1	0.2	0.0	0.3	0.	0.1	0.0	0.1	0.1
23. Petroleum products.....	0.1	0.2	1.4	0.5	1.2	0.1	0.3	0.0	0.1	0.0	0.1	0.0
24. Rubber, miscellaneous plastics.....	1.1	0.4	0.8	1.9	0.9	0.0	0.2	0.1	0.2	0.0	0.1	0.1
25. Leather.....	7.4	3.9	2.9	1.1	2.7	0.	2.0	0.3	0.6	0.1	0.8	0.
26. Glass.....	0.1	1.0	1.6	1.2	1.0	0.	0.0	0.3	0.8	0.1	0.1	0.1
27. Stone and clay.....	1.8	2.1	4.9	4.7	4.3	0.7	2.3	1.2	1.8	0.8	1.1	0.7
28. Iron and steel.....	-0.1	-0.1	-0.7	-0.6	-0.5	-0.1	-0.0	-0.0	-0.2	-0.0	-0.0	-0.1
29. Nonferrous metals.....	-5.6	-4.1	-7.9	-7.0	-7.2	-0.5	-0.8	-0.3	-2.3	-0.2	-0.1	-0.1
30. Fabricated metals.....	3.2	3.0	6.1	7.1	7.4	0.5	1.5	0.4	1.1	0.4	0.9	0.5
31. Nonelectrical machinery.....	-0.3	-0.3	-0.3	-0.6	-0.6	-0.0	-0.1	-0.0	-0.0	-0.0	-0.0	-0.0

32. Electrical apparatus.....	-2.0	-2.8	-4.3	-4.2	-5.7	-0.3	-1.0	-0.3	-0.5	-0.1	-0.1	-0.1
33. Appliances, lighting equipment.....	0.5	0.5	0.7	1.3	1.4	0.1	0.2	0.0	0.1	0.0	0.4	0.0
34. Electronics equipment.....	-18.6	-26.0	-36.7	-6.1	-42.9	-1.0	-4.0	-3.8	-5.7	-0.8	-1.5	-0.9
35. Motor vehicles.....	0.5	3.1	3.1	29.2	8.1	0.2	1.9	0.8	0.9	0.0	0.5	0.2
36. Aircraft.....	-68.7	-64.2	-41.5	-82.0	-40.9	-4.1	-74.5	-16.2	-29.5	-1.8	-1.2	-10.8
37. Other transportation equipment.....	-0.4	-0.2	-0.5	-0.2	-0.4	-0.0	-0.1	-0.0	-0.5	-0.1	-0.0	-0.2
38. Instruments.....	-4.0	-10.0	-5.4	-1.9	-4.6	-1.3	-0.5	-0.1	-0.4	-0.1	-0.3	-0.0
39. Miscellaneous manufacturing.....	4.1	5.1	3.2	2.4	2.9	0.2	0.8	0.9	0.1	0.1	0.3	0.2
40. Ordnance.....	-16.0	-31.9	-7.0	-13.1	-8.1	-5.5	-8.9	-1.4	-9.3	-3.8	-2.7	-0.1
41. Research and development.....	-2.1	-4.3	-2.4	-1.3	-4.8	-0.7	-0.4	-0.3	-6.5	-0.6	-2.5	-0.5
Net increase.....	-64.2	-62.3	-18.5	-24.7	-7.9	17.3	-14.3	39.1	-17.0	6.1	20.2	6.9
Gross increase.....	53.5	81.6	88.3	92.4	107.8	30.7	76.0	61.5	37.8	13.5	28.6	19.8
Gross decrease.....	117.7	143.9	106.8	117.0	115.8	13.4	90.3	22.5	54.8	7.4	8.4	12.9

TABLE A-6.—Change in labor earnings in national industries—Continued

National industry	Region										
	(13) Oklahoma, Louisiana, Ar- kansas	(14) Texas	(15) Montana, Wyoming, Idaho	(16) Colorado, New Mexico	(17) Arizona, Nevada, Utah	(18) Oregon, Washington	(19) California	(20) U.S. net increase	(21) U.S. gross increase	(22) U.S. gross decrease	(23) Percent change, all in- dustries ¹
1. Livestock.....	4.9	6.4	3.9	3.3	2.3	2.8	7.5	132.8	132.8	0.	1.67
2. Other agriculture.....	6.9	11.3	3.5	2.4	2.4	4.4	13.6	111.2	111.2	0.	1.65
3. Forestry, fisheries.....	0.3	0.5	0.0	0.0	0.0	0.6	0.9	5.2	5.2	0.	1.33
4. Agricultural services.....	0.4	0.3	0.1	0.1	0.2	0.3	1.9	10.3	10.3	0.	2.14
5. Coal mining.....	0.1	0.	0.0	0.1	0.2	0.0	0.	11.8	11.8	0.	0.98
6. Food, kindred products.....	4.8	6.4	1.1	2.1	1.4	4.5	16.9	165.6	165.6	0.	1.66
7. Tobacco.....	0.	0.	0.	0.	0.	0.	0.	7.2	7.2	0.	1.76
8. Fabrics, yarn.....	0.1	0.2	0.	0.	0.	0.1	0.	28.0	28.0	0.	1.19
9. Miscellaneous textiles, rugs.....	0.0	0.0	0.	0.	0.	0.	0.2	4.8	4.8	0.	0.97
10. Apparel.....	0.8	1.7	0.	0.1	0.2	0.4	3.5	81.3	81.3	0.	1.66
11. Miscellaneous fabricated textile products.....	0.0	0.1	0.	0.0	0.0	0.0	0.2	2.8	2.8	0.	0.54
12. Lumber, wood products.....	1.7	0.7	1.4	0.3	0.3	8.8	4.0	31.9	31.9	0.	1.26
13. Wooden containers.....	0.0	0.1	0.	0.0	0.	0.1	0.2	1.6	1.6	0.	1.05
14. Household furniture.....	0.4	0.3	0.	0.0	0.1	0.3	1.4	14.6	14.6	0.	1.27
15. Office furniture.....	0.1	0.2	0.0	0.1	0.0	.1	.6	7.3	7.3	0.	1.19
16. Paper.....	1.0	0.4	0.	0.0	0.	1.2	0.7	20.4	20.4	0.	0.83
17. Paperboard containers.....	0.2	0.1	0.	0.0	0.0	0.1	0.8	9.8	9.8	0.	0.93
18. Chemicals.....	0.2	0.5	0.0	0.1	0.0	0.2	0.2	4.6	4.6	0.	0.16
19. Plastics, synthetics.....	0.1	0.3	0.	0.	0.	0.	0.1	5.7	5.7	0.	0.59
20. Drugs.....	0.0	0.2	0.	0.0	0.	0.0	1.0	16.3	16.3	0.	1.21
21. Paints.....	0.0	0.1	0.	0.0	0.	0.0	0.2	2.2	2.2	0.	0.48
22. Oilfields.....	2.1	3.3	0.2	0.4	0.1	0.0	0.7	7.8	7.8	0.	0.38
23. Petroleum products.....	1.1	2.2	0.2	0.1	0.1	0.1	1.0	8.8	8.8	0.	0.45
24. Rubber, miscellaneous plastics.....	0.1	0.1	0.	0.1	0.0	0.	0.5	6.5	6.5	0.	0.30
25. Leather.....	0.2	0.2	0.0	0.2	0.0	0.0	0.4	22.7	22.7	0.	1.57
26. Glass.....	0.1	0.1	0.	0.	0.	0.1	2.9	7.0	7.0	0.	0.51
27. Stone and clay.....	1.2	1.3	0.1	0.5	0.5	0.5	2.9	33.5	33.5	0.	1.10
28. Iron and steel.....	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-2.7	0.	2.7	-0.94
29. Nonferrous metals.....	-1.4	-1.4	-2.0	-1.3	-4.1	-2.0	-3.1	-51.7	0.	51.7	-2.21
30. Fabricated metals.....	0.6	0.9	0.0	0.2	0.2	0.4	3.3	37.5	37.5	0.	0.54
31. Nonelectrical machinery.....	-0.0	-0.1	-0.0	-0.0	-0.0	-0.0	-0.2	-2.8	0.	2.8	-0.93
32. Electrical apparatus.....	-0.1	-0.1	0.	-0.1	-0.0	-0.2	-1.7	-23.4	0.	23.4	-0.92
33. Appliances, lighting equipment.....	0.0	0.0	0.	0.0	0.	0.0	0.4	5.8	5.8	0.	0.34
34. Electronics equipment.....	-0.7	-2.5	0.	-0.1	-1.2	-0.2	-17.4	-170.4	0.	170.0	-5.40
35. Motor vehicles.....	0.1	0.5	0.	0.0	0.0	0.0	2.1	51.4	51.4	0.	1.21
36. Aircraft.....	-9.2	-54.6	0.	-1.8	-7.8	-70.0	-260.9	-839.6	0.	839.6	-16.05

37. Other transportation equipment.....	-0.1	-0.1	-0.0	-0.0	-0.0	-0.1	-0.2	-3.3	0.	3.3	-0.23
38. Instruments.....	-0.1	-0.4	0.	-0.0	-0.1	-0.1	-2.0	-31.1	0.	31.1	-1.59
39. Miscellaneous manufacturing.....	0.2	0.1	0.0	0.3	0.1	0.2	1.2	22.4	22.4	0.	1.23
40. Ordnance.....	0.	-3.0	0.	-10.9	-5.0	0.	-36.1	-212.7	0.	212.7	-15.42
41. Research and development.....	-0.4	-0.8	-0.1	-1.0	-0.1	-0.3	-11.1	-39.9	0.	39.9	-13.26
Net increase.....	15.8	-24.6	8.5	-4.9	-10.2	-47.4	-316.2	-498.3	879.0	1377.3	-----
Gross increase.....	27.8	38.5	10.6	10.4	8.0	25.5	66.6	879.0	879.0	0.	-----
Gross decrease.....	12.0	63.0	2.1	15.3	18.3	72.9	382.8	1377.3	0.	1377.3	-----

¹ These figures are valid for the national industries on the regional, as well as on the national, level. This is because demand for the output of a national industry, no matter where it is located, is a function only of the total U.S. demand for its output; thus, the percentage change in output (equal to the percentage change in employment) of that industry in each region will be identical.

NOTE.—In all tables an entry of zero followed only by a decimal indicates the cell is empty. An entry consisting entirely of zeros, with no blank space, indicates the cell contains a figure of negligible size.

REGION

Local industry	(7)		(8)		(9)		(10)		(11)		(12)	
	Iowa, Missouri, Nebraska, Kansas		Georgia, North and South Carolina		Virginia, West Virginia, Maryland District of Columbia, Delaware		Florida		Tennessee, Kentucky		Alabama, Mississippi	
	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent
1. Printing, publishing.....	5.0	1.5	2.1	0.8	0.2	0.1	1.0	0.9	2.1	1.4	0.6	0.6
2. Electricity, gas, water.....	3.7	1.7	1.8	1.0	0.6	0.3	0.7	1.1	1.7	1.6	0.6	0.8
3. Transport, warehousing.....	9.2	1.0	-2.2	-0.3	-10.0	-1.0	-0.4	-0.1	2.8	0.6	-1.5	-0.4
4. Trade.....	59.7	1.8	26.2	1.0	7.6	0.2	11.6	1.1	26.4	1.7	9.5	0.8
5. Communications.....	4.4	1.6	2.2	1.0	0.8	0.3	1.0	1.1	2.1	1.6	0.8	0.8
6. Finance, insurance.....	14.0	1.9	6.8	1.1	2.5	0.3	2.8	1.2	6.2	1.8	2.4	1.0
7. Real estate, rentals.....	3.7	2.0	1.7	1.2	0.6	0.4	0.7	1.3	1.6	1.9	0.6	1.0
8. Repair services, hotels.....	8.2	2.0	3.6	1.1	1.3	0.3	1.5	1.2	3.7	1.9	1.3	0.9
9. Auto repair services.....	1.7	1.9	0.7	1.0	0.2	0.3	0.3	1.1	0.7	1.8	0.3	0.8
10. Business services.....	8.1	1.5	4.7	1.0	2.5	0.5	2.1	1.2	3.6	1.4	1.4	0.9
11. Amusements.....	2.3	2.1	1.0	1.2	0.4	0.3	0.5	1.3	1.0	2.0	0.4	1.0
12. Medical, education services.....	16.0	2.0	6.3	1.0	-5.5	-0.6	2.2	0.9	4.4	1.2	1.9	0.7
13. Maintenance construction.....	2.5	0.8	-2.9	-1.2	-6.4	-2.1	-0.9	-0.9	0.3	0.2	-1.3	-1.1
14. Government enterprises.....	-3.1	1.4	0.8	0.4	-0.6	-0.3	0.4	0.5	1.3	1.3	0.2	0.3
15. Office supplies.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
16. Business travel.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
17. Households.....	4.4	2.2	2.0	1.2	0.8	0.4	0.8	1.4	2.0	2.2	0.7	1.1
Net increase.....	146.1	1.7	54.7	0.8	-4.9	-0.1	24.5	0.9	60.0	1.5	18.0	0.6
Gross increase.....	146.1	1.7	59.8	0.8	17.6	0.2	25.7	0.9	60.0	1.5	20.8	0.7
Gross decrease.....	-0.	0.	5.1	0.1	22.5	0.3	1.3	0.0	0.	0.	2.7	0.1

TABLE A-7.—Coange in labor earnings for local industries by region—Continued

Local industry	Region											
	(13)		(14)		(15)		(16)		(17)		(18)	
	Oklahoma, Louisiana, Arkansas		Texas		Montana, Wyoming, Idaho		Colorado, New Mexico		Arizona, Nevada, Utah		Oregon, Washington	
	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent
1. Printing, publishing.....	2.3	1.3	1.1	0.4	1.0	2.1	-0.0	-0.0	0.0	0.1	1.0	0.6
2. Electricity, gas, water.....	1.9	1.4	1.0	0.5	0.8	2.2	0.1	0.2	0.0	0.0	0.6	0.6
3. Transport, warehousing.....	2.9	0.5	-3.7	-0.4	2.0	1.4	-2.5	-1.1	-2.0	-1.0	0.2	0.0
4. Trade.....	28.8	1.6	17.1	0.6	12.6	2.5	1.6	0.2	1.7	0.2	12.4	0.8
5. Communications.....	2.3	1.5	1.3	0.6	1.0	2.4	0.1	0.2	0.1	0.2	0.8	0.6
6. Finance, insurance.....	7.0	1.7	4.6	0.7	3.0	2.5	0.6	0.3	0.5	0.3	2.9	0.8
7. Real estate, rentals.....	1.9	1.6	1.3	0.7	0.8	2.5	0.2	0.4	0.2	0.4	0.8	0.9
8. Repair services hotels.....	4.0	1.8	2.2	0.6	1.8	2.9	0.2	0.2	0.2	0.2	1.7	0.9
9. Auto repair services.....	0.8	1.6	0.5	0.6	0.4	2.5	0.1	0.3	0.1	0.3	0.4	0.9
10. Business services.....	4.1	1.3	3.3	0.7	1.6	1.9	0.5	0.4	0.5	0.5	2.0	0.9
11. Amusements.....	1.2	1.9	0.7	0.7	0.5	2.9	0.1	0.3	0.2	0.6	0.5	0.9
12. Medical, educational services.....	7.4	1.7	3.3	0.5	3.4	2.9	-0.7	-0.4	0.3	0.2	2.8	0.8
13. Maintenance construction.....	0.2	0.1	-3.0	-1.1	0.7	1.4	-1.4	-1.7	-1.1	-1.5	-0.6	-0.4
14. Government enterprises.....	1.4	1.1	0.2	0.1	0.7	2.0	-0.2	-0.4	-0.2	-0.4	0.3	0.3
15. Office supplies.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
16. Business travel.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
17. Households.....	2.2	2.0	1.3	0.8	0.9	3.1	0.2	0.4	0.2	0.4	0.9	1.0
Net increase.....	68.2	1.4	31.2	0.4	31.2	2.3	-1.2	-0.1	0.8	0.0	26.7	0.6
Gross increase.....	68.2	1.4	37.9	0.5	31.2	2.3	3.6	0.2	4.1	0.2	27.3	0.7
Gross decrease.....	0.	0.	6.7	0.1	.0	0.	4.9	0.2	3.3	0.2	0.6	0.0

Local industry	Region 19, California		U.S. net increase		U.S. gross increase		U.S. gross decrease	
	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent
1 Printing, publishing.....	-1.6	-0.3	65.2	1.1	66.8	1.1	1.6	0.0
2 Electricity, gas, water.....	-1.1	-0.3	49.6	1.2	50.7	1.3	1.1	0.0
3 Transportation, warehousing.....	-14.6	-0.9	81.4	0.5	118.2	0.7	36.8	0.2
4 Trade.....	-9.4	-0.2	816.8	1.4	826.2	1.4	9.4	0.0
5 Communications.....	-1.6	-0.3	61.4	1.3	63.0	1.3	1.6	0.0
6 Finance, insurance.....	-1.9	-0.2	190.5	1.5	192.4	1.5	1.9	0.0
7 Real estate, rentals.....	-0.2	-0.1	50.1	1.6	50.3	1.6	0.2	0.0
8 Repair services, hotels.....	-1.8	-0.3	113.9	1.6	115.7	1.6	1.8	0.0
9 Auto repair services.....	-0.0	-0.0	22.9	1.5	22.9	1.5	0.0	0.0
10 Business services.....	1.1	0.1	110.6	1.1	110.6	1.1	0.0	0.0
11 Amusements.....	0.2	0.1	33.6	1.7	33.6	1.7	0.0	0.0
12 Medical, education services.....	-14.9	-1.0	181.2	1.3	202.2	1.5	21.1	0.2
13 Maintenance construction.....	-6.9	-1.3	10.3	0.2	34.9	0.7	24.6	0.5
14 Government enterprises.....	-2.4	-0.6	38.7	1.0	42.0	1.1	3.4	0.1
15 Office supplies.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16 Business travel.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17 Households.....	-0.3	-0.1	62.7	1.8	63.0	1.8	0.3	0.0
Net increase.....	-55.5	-0.4	1888.7	1.2	1992.6	1.3	103.8	0.1
Gross increase.....	1.3	0.0	1888.7	1.2	1992.6	1.3	0.0	0.0
Gross decrease.....	56.8	0.4	0.0	0.0	0.0	0.0	103.8	0.1

NOTE.—In all tables an entry of zero followed only by a decimal indicates the cell is empty. An entry consisting entirely of zeros, with no blank space, indicates the cell contains a figure of negligible size.

TABLE A-8.—Direct labor earnings before change by region:

(Millions of dollars)

Region	Military direct labor earnings ¹	Non-household civilian direct labor earnings	Household direct labor earnings ²
	(1)	(2)	(3)
1 New England.....	571	2,812	225
2 New York.....	477	5,447	332
3 New Jersey, Pennsylvania.....	769	4,184	385
4 Michigan, Ohio.....	413	4,491	399
5 Indiana, Illinois, Wisconsin.....	474	4,940	432
6 Minnesota, North and South Dakota.....	86	1,234	78
7 Kansas, Iowa, Nebraska, Missouri.....	478	2,441	197
8 Georgia, North and South Carolina.....	1,052	1,756	162
9 Maryland, Virginia, Delaware, West Virginia, District of Columbia.....	1,512	3,754	203
10 Florida.....	404	1,397	62
11 Kentucky, Tennessee.....	353	1,202	91
12 Mississippi, Alabama.....	439	899	69
13 Arkansas, Louisiana, Oklahoma.....	466	1,665	108
14 Texas.....	991	2,004	168
15 Idaho, Montana, Wyoming.....	67	534	30
16 Colorado, New Mexico.....	361	888	48
17 Arizona, Nevada, Utah.....	288	809	42
18 Oregon, Washington.....	385	1,477	94
19 California.....	1,613	5,783	345
Total United States.....	11,198	47,807	3,472

¹ Military direct labor earnings include earnings of both civilian and military employees of the Department of Defense. See table A-12.

² Households were included as a local industry, rather than as a separate final demand category.

TABLE A-9.—Total change in labor earnings by region

(Millions of dollars)

Region	Military direct labor earnings	Non-household civilian direct labor earnings	Total ¹ gross decrease	Total ² gross increase	Total net increase (column 4—column 3)
	(1)	(2)	(3)	(4)	(5)
1 New England.....	-114.20	50.66	231.9	218.1	-13.8
2 New York.....	-95.43	98.14	239.3	442.6	203.3
3 New Jersey, Pennsylvania.....	-153.70	75.39	260.5	447.2	186.7
4 Michigan, Ohio.....	-82.53	80.92	199.5	527.6	328.1
5 Indiana, Illinois, Wisconsin.....	-94.71	89.01	210.5	582.3	371.8
6 Minnesota, North & South Dakota.....	-17.18	22.23	30.6	141.9	111.3
7 Kansas, Iowa, Nebraska, Missouri.....	-95.70	43.99	186.0	266.1	80.1
8 Georgia, North & South Carolina.....	-210.32	31.63	237.9	152.9	-85.0
9 Maryland, Virginia, West Virginia, Delaware, District of Columbia.....	-302.37	67.63	379.7	123.0	-256.7
10 Florida.....	-80.78	25.17	89.5	64.4	-25.1
11 Kentucky, Tennessee.....	-70.59	21.66	79.0	110.3	31.3
12 Mississippi, Alabama.....	-87.81	16.21	103.4	56.8	-46.6
13 Arkansas, Louisiana, Oklahoma.....	-93.19	29.99	105.2	126.0	20.8
14 Texas.....	-198.27	37.73	268.0	114.1	-153.9
15 Idaho, Montana, Wyoming.....	-13.37	9.62	15.5	51.4	35.9
16 Colorado, New Mexico.....	-72.18	15.99	92.4	30.0	-62.4
17 Arizona, Nevada, Utah.....	-57.63	14.59	79.2	26.7	-52.5
18 Oregon, Washington.....	-77.02	26.61	150.5	79.4	-71.1
19 California.....	-322.59	104.19	762.2	172.1	-590.1
Total United States.....	-2,239.58	861.36	\$ 3,727.0	\$ 3,727.0	-----

¹ Column 1, plus gross decrease in national and local industries, tables A-6 and A-7.

² Column 2, plus gross increase in national and local industries, tables A-6 and A-7.

³ Totals may not add because of rounding.

TABLE A-10.—Source references for labor earnings

Sector number	Industry	Procedure	Source
1, 2.....	Livestock, other agriculture. Forestry, agricultural services.	Estimates of net income of farmers.....	U.S. Dept. of Agriculture, Agricultural Statistics, 1961. U.S. Dept. of Commerce, Survey of Current Business, July 1961.
3, 4.....		Wages and salaries of employees.....	
5-41.....	Manufacturing sectors.....	Wages and salaries of payroll workers, salaries of administrative workers, and income of unincorporated business were summed.	U.S. Dept. of Commerce, Census of Manufacturers, 1958 and Survey of Current Business, ¹ July 1961.
All local sectors 1-16.....	Trade and service sectors.....	Same as for manufacturing.....	U.S. Dept. of Commerce, Census of Business and Selected Services, 1958; Bureau of Employment Security, Employment and Wages, 1958; U.S. Dept. of Commerce, Survey of Current Business, ¹ July 1961.

¹ When the Survey of Current Business statistics were not detailed enough, the Income of Unincorporated Business was distributed, among the 60-order sectors according to information given in Internal Revenue Service, Corporation Income Tax Returns, July 1958-June 1959.

TABLE A-11.—Source references for National industry output distribution factors

Sector number	Industry	Factor	Source
1, 2.....	Livestock, other agriculture.	Cash receipts from farm marketings.....	U.S. Department of Commerce, Statistical Abstract of United States, 1959, table 832. Same as above, tables 919, 947.
3.....		Forestry, fisheries.....	
4.....	Agricultural services.....	Wages and salaries of employees.....	Bureau of Employment Security, Employment and Wages, 1958.
5-40.....	Manufacturing sectors.....	Wages and salaries of employees.....	U.S. Department of Commerce, Census of Manufacturers, 1958.
41.....	Research and development.....	Payrolls.....	U.S. Department of Commerce, Census of Selected Services, 1958.

TABLE A-12.—Source references for local industry distribution factors

Final demand category	Factors used to distribute aggregate local outputs	Sources
Exports and net inventory change.....	Regional distribution of labor earnings in each local industry.	Real estate: U.S. Department of Commerce, Statistical Abstract of United States, 1961, table 1067. Finance: Statistical Abstract of United States, 1960, table 619. Others: Either U.S. Department of Commerce, Census of Selected Services or Bureau of Employment Security, Employment and Wages, 1958.
Imports.....	Regional distribution of total wages and salaries in all industries within a region.	U.S. Department of Commerce, Survey of Current Business, August 1961, tables 4-27, line 2.
Gross private capital formation.....	Expenditures on new plants and equipment.....	U.S. Department of Commerce, Statistical Abstract of United States, 1961, p. 795, table 1097.
Construction.....	Wages in contract construction.....	Bureau of Employment Security, Employment and Wages, 1958.
State and local government.....	Wages and salaries of state and local government employees.	U.S. Department of Commerce, Survey of Current Business, August 1961, tables 4-27, lines 28, 29, 30.
Federal Government.....	Wages and salaries of Federal employees, except Department of Defense.	Same as above.
Military.....	Payrolls and allowances (only fiscal year 1959 was available).	U.S. Congress, Joint Economic Committee, "Background Material on Economic Aspects of Military Procurement and Supplies," Subcommittee on Defense, March 1963, table 3, p. 4.

ECONOMIC IMPACT OF A MILITARY BASE

A CASE STUDY OF FORT DEVENS, MASS.*

Increasing effort has recently been devoted to investigating the broad ties between the Nation's economy and its defense spending. Relatively little consideration, however, has been given to the impact of defense spending at the local level. Yet it is in the area immediately surrounding large defense installations, more than in the Nation or large region, where the economic consequences of many defense policies and actions are most dramatically felt.

The impact of a military facility on the local economy can be evaluated in much the same manner as the economic impact of any private establishment of similar size. Yes, important differences exist in the expenditure patterns of these two types of activities. In general, the expansion in local employment generated by a military facility is not as large as that resulting from a private facility of comparable size.

In 1961, the Federal Reserve Bank of Boston sponsored a study of the economic impact of the Pease Air Force Base in Portsmouth, N. H.¹ More recently, the bank supported a research study of Fort Devens and its influence on the economies of Ayer, Mass., and other towns within a 15-mile radius. In many respects, the conclusions of the Fort Devens study parallel those of the earlier investigation and reveal a general pattern of the operating and payroll expenditures for military installations.

THE BACKGROUND

Fort Devens is the largest military installation in New England. It was established in 1917 and served as a center for induction, training, and separation for both World Wars. After each war, it was closed and reduced to caretaker status. In 1946, a portion of the post was leased to the University of Massachusetts as the site of a temporary college campus to accommodate veterans attending college under the GI bill. The post was reopened for the Korean war and since that time has maintained a relatively stable garrison of about 10,000 men. In addition, the fort's community includes about 8,000 military dependents and 2,000 civilian employees and their families.

The fort is located in Ayer, a small, semirural town in north-central Massachusetts. More than a fifth of the town's 8.8 square miles is occupied by the fort. Only 20 percent of the remaining area is developed, mainly for housing. Commercial and industrial development encompasses less than 2 percent of the town area.

About 40 percent of Ayer's population of 4,900 is directly associated with the fort. Military families comprise about one-fourth of the total and civilian employees and their families about 15 percent. In the past the town's economy was also heavily dependent on its

* Reprinted from Federal Reserve Bank of Boston *Business Review*, October 1965. This article is based on a graduate thesis by Ian Donald Turner at Harvard University. The study was conducted with the aid of a research grant from the Federal Reserve Bank of Boston. Copies of the complete report are available on request from the research department.

¹ *New England Business Review*, July 1961.

large railroad classification yard and on a tannery, but neither of these is now in operation. After the destruction of the tannery by fire in 1961, the importance of manufacturing declined substantially. Of the six firms that remain in this sector, only one, a maker of industrial sewing machines, employs more than 50 workers. Nearly half of the people who work in Ayer are now engaged in wholesale and retail trade in which the pay tends to be relatively low. As a result average wage and income levels are considerably lower than in the State.

Because of the proximity of the fort, per capita sales are more than double the State average and about three times that of similar-sized towns in Massachusetts. However, many of the needs of the soldiers stationed at the post are met by base facilities, such as the post exchange and commissary, which for military personnel generally offer lower prices than commercial establishments in Ayer. Thus, the leading retail products are those such as lumber, furniture, and automobiles, which are not sold on the post. For example, the sales volume of automobiles in Ayer is four times the State average.

Although the presence of the fort currently adds considerably to the town's economic activity, it has one unfortunate psychological impact. Because many of the town's businessmen recall the closing of the fort after each of the World Wars, they feel uncertain about its future and hesitate to invest in the town's commercial facilities. Underinvestment leads to increasingly older, unattractive, and less efficient facilities which in turn lead to bypassed sales and even less investment.

Housing is another sector of Ayer's economy which is heavily influenced by the presence of the military. Due to the demand provided by civilian and military personnel attached to the Fort, Ayer landlords are able to receive high rents for their units, with the median rent of \$86 amounting to 15 percent more than the State average. This is true despite the age and poor condition of much of the town's housing. The 1960 Census of Housing revealed that over half the town's rental units were deteriorating or dilapidated in contrast to less than one-fifth for the State as a whole. Even the opening of several hundred new housing units on the post did not reduce the demand for rental units in the town. The vacated units were rapidly rented as families living 10 or 15 miles away moved closer.

Another aspect of Ayer's economy where the military impact is important is municipal finance. Like many suburban communities, Ayer's tax rate has been climbing steadily. The rate nearly doubled between 1952 and 1963, rising from \$45 to \$80 per thousand dollars of assessed valuation. However, unlike most communities, the dominant reason for the rising tax rate has not been mounting school costs but a lack of significant growth in the town's tax base. Ayer's school costs, although rising, are heavily supported by Federal funds. Under Public Law 874, the large proportion of school children who are dependents of post personnel qualifies Ayer's school system for large Federal grants. About 73 percent of the town's schoolchildren are qualified for these grants. As a result, over one-half of Ayer's school expenditures are paid by the Federal Government.

EXPENDITURES OF THE FORT

Annual operating expenditures of the fort, excluding construction spending, total about \$70 million. Of this amount, approximately \$30 million is spent for procurement of supplies from commercial sources. The local impact of these procurement expenditures is modest, however, since less than 1 percent are made in Ayer with an additional 11 percent spent within a 15-mile radius of the fort. On the other hand, about 62 percent of these procurement expenditures are made within New England, with Boston alone receiving 31 percent. Thus, the absolute effect of the fort's procurement spending is felt more within certain of the region's wholesaling sectors though the total impact on the regional economy is relatively small.

On the other hand, the fort's annual \$10 million civilian and \$30 million military payrolls do have a significant effect on both Ayer and the surrounding area. In an attempt to determine where the military payroll was spent and to estimate its total effects, questionnaires were distributed to 1,000 soldiers on the post. About 400 usable replies were tabulated. The data reveal a general pattern of expenditures for military personnel, the important determinants of which are the marital status of the soldier and his place of residence.

As might be expected, food and housing account for nearly 60 percent of married budgets. Other necessities account for most of the remainder, with only 5 to 6 percent allotted to entertainment and recreation. On the other hand, bachelors spend about 55 percent of their income for nonnecessities such as entertainment, recreation, and transportation. They also save about 15 percent of their incomes, almost twice the amount that married couples save.

Military payroll spending

[Percent of income]

Location	Fort Devens			Pease Air Force Base		
	Average	Single	Married	Average	Single	Married
Post.....	41	40	41	38	37	38
Adjacent town.....	10	9	10	26	15	28
Within 15 miles but excluding adjacent town.....	20	8	24	18	11	20
Beyond 15 miles.....	29	43	25	18	37	14
Total.....	100	100	100	100	100	100

Source: Fort Devens survey questionnaire. Laben, Pease Air Force Base study.

Despite these significant differences in budget allocations, the survey reveals that both married and single soldiers spend about 40 percent of their income on the post and about 10 percent in Ayer. However, bachelors spend about 43 percent of their income outside a 15-mile radius of the post, compared to only 25 percent for married soldiers. This is, of course, due mainly to the greater mobility of bachelors. In addition, some married personnel live outside of Ayer but within 15 miles of the fort and thus spend the rental portion of their budgets within the 15-mile ring.

The data reveal that where the soldier lives is the place in which he spends at least half of his income. The average soldier who lives on base, for example, spends only 10 percent of his funds in Ayer, but if he resides in Ayer, he spends more than half his income there. While housing automatically accounts for much of this "spend where you live" phenomenon, the geographic spending patterns for transportation, food, clothing, and savings also exhibit ties to one's place of residence.

THE GENERAL SPENDING PATTERN

As mentioned at the outset, the results of the Fort Devens study show a marked similarity to those of the earlier study of spending at Pease Air Force Base. As shown in the table on page 727, both studies reveal that typically 35 to 40 percent of the military payroll is spent on the base. As a result, the effect of military payrolls upon local trade and services is substantially less than that of civilian consumers with comparable income. By the same token, the pattern of military procurement spending is considerably different from that of some manufacturing firms which rely heavily on the nearest community for supplies and services. This is not the case in most military installations which mainly purchase in national market centers.

The accompanying table also discloses substantial differences in the amount of off-post spending by military personnel which is "captured" by the nearest community. The data suggest that while the proportion of payroll expenditures made both on-post and outside the 15-mile ring are relatively fixed for most military installations, the distribution of the remaining expenditures among communities within the 15-mile ring is flexible. Thus Portsmouth received a much greater proportion of the off-post payroll expenditures from Pease Air Force Base than did Ayer from Fort Devens. This is due in part to Portsmouth's greater size and more isolated position.

THE MULTIPLIER AND SIZE OF THE ECONOMY

Ayer receives most of its "export" income from sales to military personnel stationed at Fort Devens and from the sale of a few industrial products. This is called export income since it is derived from the sale of services and goods to those who live outside Ayer or to military personnel stationed at the fort. As export income increases, so does employment. More jobs lead to further demand for goods and services which in turn contribute to more workers being hired. This additional income is either spent in Ayer or used to purchase goods and services from other areas. This series of events is known as the multiplier effect. Analysis of employment data for 1954 through 1962 yielded an employment multiplier of 1.2. Thus, in Ayer every five workers engaged in producing services and goods for export out of the community generate one additional job in the local market. This low multiplier is typical of a town of Ayer's population.

THE RESULTS

Without Fort Devens, Ayer's economy would be considerably smaller than it is today. Altogether, 525 jobs (one-fourth of Ayer's labor force) are dependent on economic activity generated by Fort Devens. Of this total, 437 are directly dependent on income received from the Fort and its personnel. These jobs, in turn, generate the need for another 88 workers who provide goods and services for the augmented local population.

Fort Devens' influence is felt in another way. Today Ayer is an area shopping center because it has specialized retail stores offering a variety of lumber, furniture, and automobile products. Also, the town offers specialized services in such fields as dentistry. If, for any reason, Fort Devens were to be completely closed down, many of these larger specialty stores would go out of business. Ayer would lose much of its appeal as a shopping center. Residents from surrounding communities would do most of their shopping elsewhere and many stores and service establishments in Ayer would lose a significant part of their business.

What would the total impact of a Fort Devens closing be on a community such as Ayer? Would 30 percent or more of the labor force be unemployed and move out of the community? The answer is quite clearly no. When Fort Devens closed down after World War II, the economy of Ayer did not collapse and its population did not decline significantly. A number of stores went out of business, but most of the unemployed found work in Fitchburg, Worcester, and nearby labor markets. Many of the replacement jobs were low paying or were otherwise unsatisfactory. Nevertheless, these new jobs brought income into the town of Ayer and kept the economy going.

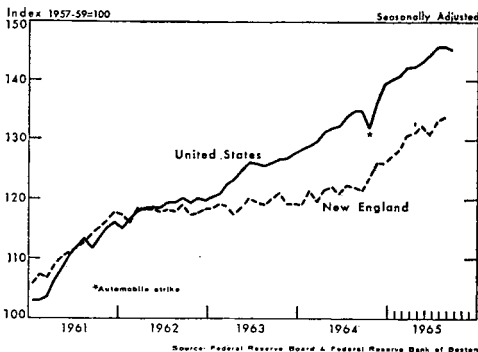
If Fort Devens had been a large private manufacturing firm rather than a military installation, the economic history of Ayer would have been entirely different. First of all, Ayer would have had a much larger population than it had in 1946. Unlike a military base, private firms generally sublet much of their work to local businessmen. They do not operate commissaries, PX's, and movies. Only occasionally do they build homes for employees. The result is that a much larger part of a private firm's income and that of its employees is spent in the local area and helps to build the local economy.

When a civilian facility with, say, 12,500 employees closes down, however, the local impact is always serious and often disastrous. The complete loss of such a firm might well permanently cripple a town the size of Ayer. On the other hand, a military installation with the same number of employees procures most of its materials and equipment from national markets and provides a great variety of consumer goods and services to its personnel. In short, military facilities are largely self-sufficient and their closing down leaves a much smaller impact on the surrounding communities.

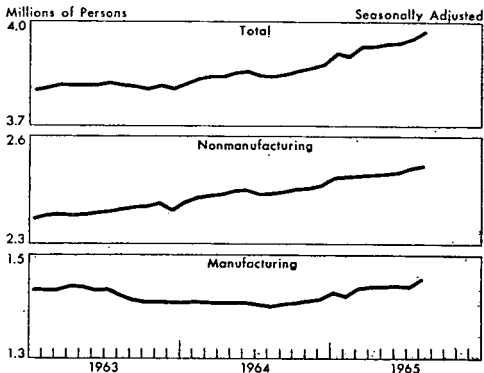
In the case of Fort Devens, however, the installation is far from closing. Recent construction and new training commitments suggest no downturn in economic activity in the foreseeable future.

New England **Business Review**

Some Economic Indicators

**PRODUCTION INDEXES:
TOTAL MANUFACTURING**

Manufacturing production in New England continued to show a steady rise into the fall. The index in the Nation declined slightly in September mainly as a result of lower steel production.

**NONAGRICULTURAL EMPLOYMENT
New England**

Total nonagricultural employment in New England shows a steady rise at a high level. Expansion is especially marked in nonmanufacturing and employment in manufacturing has also turned upward after declining during most of 1964.

Here's New England

MANUFACTURING INDEXES (SEASONALLY ADJUSTED) (1957-59=100)

	New England			United States		
	August 1965 ¹	July 1965	August 1964	August 1965	July 1965	August 1964
All manufacturing.....	134	133	122	146	146	135
Nonelectrical machinery.....	145	147	131	162	162	144
Electrical machinery.....	144	147	130	159	159	142
Transportation equipment.....	171	144	131	151	150	136
Textiles, apparel, leather.....	107	109	103	135	135	126
Textiles.....	110	110	103	134	134	124
Apparel.....	111	116	109	(²)	145	135
Leather and shoes.....	99	102	97	(²)	108	106
Paper.....	124	135	115	142	142	133

BANKING AND CREDIT

	Percent change from—			Percent change from—		
	August 1965	July 1965	August 1964	August 1965	July 1965	August 1964
Commercial and industrial loans (million dollars) (weekly reporting member banks).....	2,197	+2	+19	46,827	+1	+21
Deposits (million dollars) (weekly reporting member banks).....	6,134	+1	+11	155,164	0	+9
Check payments (million dollars) (selected cities).....	199,803	+3	+20	3,018.8	0	+13
Consumer installment credit outstanding (index, seasonally adjusted 1957-59=100).....	158.9	+1	+9	189.7	+1	+13

DEPARTMENT STORE SALES

Index, seasonally adjusted 1957-59=100...	127	-3	+2	(²)	(²)	(²)

EMPLOYMENT, PRICES, MAN-HOURS AND EARNINGS

Nonagricultural employment (thousands).....	4,043	+1	+3	61,070	+1	+4
Insured unemployment (thousands) (excluding R.R. and temporary programs).....	84	-11	-22	1,129	-1	-14
Consumer prices (index, 1957-59=100).....	*111.9	0	+1	110.0	0	+2
Production-worker man-hours (index, 1957-59=100).....	101.0	+3	+6	111.5	+1	+8
Weekly earnings in manufacturing (dollars).....	*99.23	+1	+4	106.60	0	+3

OTHER INDICATORS

Total construction contract awards ³ (thousand dollars).....	238,385	-8	0	4,561,629	-4	+6
Residential.....	106,965	-4	+8	2,001,084	-2	+6
Nonresidential.....	94,574	-2	-15	1,583,257	-5	+12
Public works and utilities.....	36,846	-26	-36	977,288	-7	-1
Electric energy production (4 weeks ending Aug. 7, 1965) (index, seasonally adjusted 1957-59=100).....	150	-3	+5	161	-1	+5
Business failures (number).....	71	+78	0	1,131	+5	-3
New business incorporations (number).....	851	-19	+5	16,114	-4	+11

¹ Preliminary.² Not available.³ 3-months moving averages June, July, August.⁴ Massachusetts.

THE SALINA STORY: "SWORDS INTO PLOWSHARES"*

PREFACE

This recital of the steps taken by the citizens of Salina, Kans., in overcoming the impacts of the closure of Schilling Air Force Base is a heartening example of American toughness, ingenuity, and resilience. It was for the purpose of presenting this story to the American people that the Department of Defense commissioned a Salina firm to write Salina's story. Thus, the contents of the following pages are written from the local viewpoint. This local approach is, of course, what we wanted—for it makes *The Salina Story* a valuable guideline for any American community in organizing and acting to meet changed circumstances.

The efforts of the Defense Office of Economic Adjustment, as described in *The Salina Story*, reflect the philosophy expressed by Secretary McNamara on July 10, 1965:

While the Nation as a whole * * * benefits from the closing of surplus military facilities, these closures often have a substantial impact on the employees and communities involved. We are all aware of that fact. The Defense Department, in my judgment, bears a special responsibility as an employer. It has long been my contention that the burden of major dislocations caused by our dynamic economic growth should not rest solely upon the people immediately involved. Our society should help to carry that burden.

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INTRODUCTION

This story of Salina, Kans., is a recital of the efforts of a small mid-western community to overcome the economic, governmental, and social impacts of the closing of a large nearby Strategic Air Command installation—Schilling Air Force Base.

*Issued by the Office of the Secretary of Defense, August 1966.

It is a story of—

People, and the leaders they selected to bring about the betterment and vitalization of their community.

The American governmental process, particularly the close collaboration between local, State, and Federal activities; and the highly motivated sense of social responsibility shown by all of these levels of government.

The close relationship between leadership capability and economic growth; with the former having the predominant role in bringing about the latter.

Salina is a community of some 45,000, located almost in the geographic center of the contiguous 48 States. It is a trade and service center in a predominantly agricultural region—one which extends into Nebraska, Colorado, and Oklahoma. Population growth in the 1950's was phenomenal (65 percent). This expansion, however, was closely tied into the growth of Schilling Air Force Base, which had been reopened in 1952. It was in this context—the local commitment to Schilling as the basis for growth—that the community received the Department of Defense notice of the planned June 1965 closing of the Base.

The Salina story is presented in chronological sequence, beginning with a brief summary of Salina life in 1964, before the closure announcement. It ends with a description of Salina in mid-1966, after the major planning, organizing, and implementing phases of the adjustment had been completed.

The appendix includes more detailed discussions of the major elements of the adjustment program, as well as statistical data covering the major local economic indicators.

Salina's story is one of community resiliency—and it is a tribute to the persistence, patience, and devotion to a cause, exhibited by all of those who played a part.

Chapter I

SALINA, 1964

In September 1964, the Salina City Planning Commission forwarded a comprehensive plan for the city's growth to the city commissioners. The document opens with the following statement:

In 1724 a French emissary, who was in the area of what is now Salina, wrote: "This is a fine country, and the most beautiful land in the world. The meadows are rolling like the sea and abound in wild animals, especially in the ox, cow, hind, and stag in such quantities as to surpass the imagination * * *"

The report proceeds to describe Salina in terms of its excellent schools (the Salina Senior High School ranked highest in the State in State scholarships for 12 of the past 13 years); the major population growth (Salina County was second in population growth in the State during the 1950's); the ever-increasing dependence on trade, the 50 churches, two private colleges, and the city's plans for future growth (a population of 59,000 was expected by 1975, increasing to 72,000 by 1985).

Salina's transportation resources are superb—located at the intersection of two interstate highways (I-70 and I-35W); served by four major railroads; a scheduled airline, and numerous trucking and bus concerns.

But the report also cited some sobering problems. The decline of the central business district paralleled that of many American communities. A significantly high percentage (20.6 percent) of Salina's housing was evaluated as either deteriorating or dilapidated by the 1960 census. There was a need for controlling the direction of future growth to prevent overly expensive extensions of city services in a north-south direction. Finally, the absence of an industrial base—and the overwhelming reliance on Schilling Air Force Base and trade revenues was recognized. With regard to the latter, the report notes:

Obviously the growth pattern and future of Schilling Air Force Base are quite vital to any intelligent forecasts or predictions for the future of Salina. Unfortunately, the future of most military installations is virtually impossible to forecast.

In the various sections of the report which were related to economic base considerations the need for diversification was emphasized repeatedly. The inference was quite clear. Efforts to attract new industry to the community had been spasmodic and ineffectual. Industrial development was and had been at a virtual standstill. Most civil leaders would admit that the reason was complacency, a complacency directly attributable in large measure to the presence of Schilling Air Force Base.

Schilling, a sprawling complex of nearly 4,000 acres, located less than a mile from the city's boundary, represented approximately 25 percent of the county population in the fall of 1964. Except for a 2-year period of deactivation in 1950-51, the community had become dependent upon the economic forces generated by the activities at the base. Schilling Air Force Base was started in 1942 as Smoky Hill Army Airfield and continued as a bomber base until deactivated in the fall of 1949. In the spring of 1952 it had been reopened as a part of the SAC family of major bomber bases and, in the early 1960's, a complex of 12 Atlas intercontinental missile installations was completed. Throughout these years, the community had received the economic benefits of nearly 200 million construction dollars and yearly payrolls ranging from 15 to 20 millions of dollars. Physically, the base represented over 700 buildings, hundreds of related structures, a complete complex of utility and service systems and hundreds of acres of aircraft pavements.

"Our City Planners on the Opium Pipe." This headline startled a number of Salinans reading the Salina Journal in the fall of 1964.

Is Everyone at Fifth and Ash on the Opium Pipe? Not at all, friend, not at all. Indeed the contrary is true. While to the literal-minded the predictions of Salina's newest plan for city development may seem hallucinatory, they actually are conservative in the best sense of the word. * * *

Salina's new comprehensive city plan was being discussed at public townhall meetings, and at numerous civic, fraternal, and service club meetings. The Journal and the local radio and television stations were giving full and supporting coverage to Salina's new "look at the future."

Never before have Salina's family "jewels" been so thoroughly examined and weighed * * * it is a mine of vital information * * * the report should prove helpful for private as well as public development, a handbook for industry, a record for historians, and a blueprint for city expansion * * * the basic information should enable Salina to act with wisdom and success in guiding our inevitable growth. * * *

At each of these public meetings the economic base of the community was discussed in detail and the following quotes from the new city plan were given serious emphasis:

The activities and changing role of Schilling (Smoky Hill) Air Force Base have had dramatic effects upon the economy of the community. At present, industry plays a relatively minor role in the economic picture of the community * * * Salina is the home of Schilling Air Force Base. The product exported by the base is defense; defense of the rest of the States, as well as to countries and peoples around the world. These defense products serve a different kind of market, a market whose level is set more by political decisions and in response to changing defense needs. * * * To date, the industrial growth in the Salina community has been less than in the other larger cities of the State. * * * While new industry is most desirable and necessary to balance and diversify the economic base, it is also necessary for the important purpose of halting the exporting of our young people to areas with better employment possibilities. * * * A greater emphasis must be placed on the expansion of industry in Salina to the end that manufacturing becomes a much more important element in the economy of the community. * * * If industry and manufacturing are attracted to the city, reduced activities or *closure of the airbase* will have a lesser and shorter lived effect on the economy of the community.

The businessmen attending the evening city plan meeting on the 18th of November 1964 had asked that the discussion be limited to industrial development considerations. A Salina Journal headline of that evening was the subject of pre-meeting considerations.

Ninety-five More Bases Will Be Closed—Mac Makes a New Slash—Announcement Will Be Made Thursday.

The engineer-planner leading the discussion, mildly familiar with a number of air base installations throughout the United States, was of the opinion that Schilling Air Force Base was a very improbable item in the list of forthcoming closures. Schilling had a splendid runway, only recently built for the arrival of a wing of B52's; right climate, good location, adequate support facilities, room for expansion, a record of economy and efficiency, the best maintained base in the 15th Air Force (probably best in SAC), a much desired bombing range, highly praised community relations, and many other reasons. Wing Commander Colonel Crompton was at a commander's call at Davis-Monthan Air Force Base, Ariz., to accept five new trophies emblematic of Schilling's top flight performances. A committee of local citizens was at Walker Air Force Base, N. Mex., to explain how to establish an effective base-community relationship to Air Force and civilian representatives from six other airbases.

The discussion leader opened the meeting with the admonition that some day Schilling would be on a similar list and the matter of diversification of the community's economic base had a new sense of urgency.

Chapter II

THE CLOSING ANNOUNCEMENT, NOVEMBER 19, 1964

At 10:40 a.m. on November 19, 1964, the citizens of Salina heard that, within half a year, a segment of the community which had been a mainstay of business activity would disappear. Specifically, the Department of Defense announced that:

The B-47 bomber wing would be inactivated by March 1965.
The ATLAS F ICBM Squadron would inactivate by June 1965.

The KC-135 jet air refueling aircraft would be relocated by June 1965.

Schilling Air Force Base would be closed by June 30, 1965.

The word "shock" was used to describe the reaction of civilian and military citizens of the Salina community. Disbelief better describes the reaction of those that were closest to the base. Despite spirited statements by civic leaders, statements exhorting the community to reach for our bootstraps, bitterness best describes the mood of the people. "We have a sound economic future, with or without the base." "We have good leadership and good people." "A crisis either knits a town together or disintegrates it." These and other similar truths had a hollow ring on the 19th of November. On that date, the one-line letter, which appears daily on the front page of the Journal, said:

DEAR SAL: And a Merry Christmas to you, too, Secretary McNamara.
Yours,

INA.

Not all of the reaction was prompted by economic loss considerations. A great many more people had equally important reasons to resent this unexpected development. City Commissioner R. W. Bull spoke for many thousands of Salinan's when he said,

The men and women of Air Force Families constitute a real and lasting loss Salina will suffer from the scheduled closing.

Salina has profited from the base, not only in our economic life, but because of its people. They have become a part of our community and many have been interested in our civic life. They come and go, but their coming and going has left a great deal with us. We will recover from the economic impact of the closing I have no doubt, but we are going to lose what these fine people have brought to us and we are going to miss that very much.

Neighborhood conversations with the sergeant from across the street and the major from next door were awkward and most unpleasant that evening.

Not all of the local discussion during the next few days was devoted to questioning the basic intelligence of those in high military and governmental position. There was the ribbon cutting ceremony opening the newest portion of Interstate Highways 170 and 135W that intersect immediately west of the city, the Statler-Hilton Inn project appeared to be on the road to success, the voters were asked to approve an industrial development tax levy, and the FHA promised to protect the Salina real estate market to prevent it from becoming a depressed real estate area in the wake of the announced closing. (No such commitments were forthcoming from the VA, however.)

There were many letters to the editor offering advice and other Kansas editors were expressing their opinions. Three editorial views were expressed. Philosophical gents whose pocketbooks were not involved brought out the bromide about everyone being for economy until it affects them. It depends upon whose ox is being gored and so forth. Helpful friends sent flowers and said that the closing is a challenge and can lead to solid industrial development. The political scientists among the scribes announced that Salina's case was a test of the federal program to ease the transition from war preparedness to the paths of peace.

DEAR SAL: Can McNamara beat swords into plow shares?
Yours,

INA.

Civic leaders began hurriedly developing plans to seek a review in Washington on the ordered closing of Schilling. The details of the Washington meetings were being closely coordinated with the Kansas legislators in Washington and Gov. William Avery agreed to head the local delegation.

In a letter dated November 29, the community was introduced to the OEA (Office of Economic Adjustment) and to Donald F. Bradford, its Director. In his letter, Cyrus Vance offered the services of OEA to the city and pledged the support of all agencies of the Federal Government that might be of assistance.

On December 2, it was confirmed that Washington officials would meet with a Salina delegation on the 14th of December. Arrangements for the conference were completed by the Kansas delegation and Gov. William Avery and the men to represent Salina were selected. The seven-man group, led by Mayor Carl Rundquist, included: Carl Ramsey, chairman of the county Commission; Walter Ostenberg, superintendent of schools; Tom Lillard, local attorney and industrial development committee chairman of the chamber of commerce; Whitley Austin, editor of the Salina Journal; Norris Olson, city manager; and Jim Preston, chamber of commerce manager. Prior to the trip to Washington, a townhall meeting was held at the senior high school. Neighboring communities of Abilene, Beloit, Ellsworth, Lincoln, Lindsborg, Lyons, Marion, McPherson, Minneapolis, and Wilson had been invited to attend the meeting and did. At this meeting the delegation members listened for advice and expressions from the 250 or more citizens in attendance and everyone was given full opportunity to voice his or her opinions. It was decided that two principal questions would be asked of the Department of Defense.

Was the decision to close Schilling made objectively?

Will the closing impair our national security?

If the delegation was satisfied with the answers they were then prepared to talk of alternate uses of the base. Members of the delegation were confident that they had obtained a good cross section of community opinion for their Washington visit.

Dear SAL: Schilling presented today their check for \$15,635.16 to the Salina Community Chest.

INA.

In a press announcement prior to Salina's visit to Washington, Eugene Zuckert, Secretary of the Air Force, pointed out that he had never heard of so much concern in the Air Force about a base closing and that Air Force officials realized the impact to the community.

Journal Editor Austin reported the results of the Washington visit in a lengthy article headlined "Only a Civilian Future Is Seen for Schilling—But That Future Could Be Exciting." Quite obviously, the Salina troops had lost the battle to rescind the closing action. In part Mr. Austin said:

Salina now has only one job to do for Schilling Air Force Base. That is to develop its civic, commercial, and industrial potential by civilian enterprise. Chances of the base being used for any major military purposes are remote. War might bring that chance but who wants war? The Government already has plans to help to convert Schilling for peaceful profit. They are exciting plans. We will ask the Government to deliver, to make this a show place, a pathfinder, but Salina also must do its part with brains, money and without jealousy, envy or greed.

The Pentagon gave us first-class care as a hard case deserves. They pinned the purple heart on our bosoms and then they applied the pain killers. The date for Schilling's sudden death is still June 30. Why was the arrow broken for Schilling? Certainly it was not political. Even Republican Congressmen are agreed. The seven of us went to Washington like Kansas Dorothys off to see the wizard, the wonderful wizard of Oz. Mostly, we saw Kelley, George, Colonel. This Kelley, an urbane trooper with a Ph. D. and a bright future already had slipped the mickey to Carlson and Dole. Kelley had the answers to any questions we put. He was briefed and then some. He was so good he should be solving Vietnam. Secretary Vance assured us that they would mobilize all the resources of government, and not only those of the Department of Defense, to minimize the impact upon Salina. We know that time is of the essence. We shall cut every corner possible to help you.

Austin reported Bradford to be an "energetic and enthusiastic man who has no use for redtape" and that Bradford and his staff would visit Salina in mid-January to help with the closing. The delegation was assured that if there was a failure to find another governmental use, the Government would use its resources in order to lessen the economic impact on the Salina area.

Congressman Bob Dole announced on December 18, that he would open a branch office in Salina to operate at least during the scheduled closing of the base. Dole said that there had been numerous inquiries and requests for information and that in his opinion, a congressional office in Salina would be beneficial, not only to the community and the surrounding areas, but also to the Federal agencies who had indicated their willingness and interest in helping Salina make the necessary adjustments. This decision of Congressman Dole's proved to be a highly important contribution to the community. His office became the focal point for all of the community's efforts in the conversion processes that were to take place in the ensuing months.

Chapter III

THE ORGANIZING EFFORT

On the day before Christmas, the Salina City Commission and Salina Chamber of Commerce, announced jointly that a coordinating committee had been formed to unite the community business and political elements in a harmonious effort to counter the economic blow of the base closing. The committee was not to have power to expend public funds without the approval of the official bodies but could act in the name of the city in the liaison work with the Air Force and other Federal agencies. The committee's main job was to bring industry and commerce to Salina.

At its first meeting this newly formed committee chose for its name the "Schilling Development Council" and elected John Williamson, vice president of Kansas Power & Light Co., as its chairman. This carefully selected committee of seven included:

Whitley Austin, editor and publisher of the Salina Journal.

Clem Blangers, secretary of the local labor unions.

Allen Dodge, owner-director of Homestead Building & Loan Co.
Tom Lillard, attorney and chairman of the chamber of commerce industrial development committee.

Carl Rundquist, mayor of Salina and manager of the Credit Bureau of Salina.

Murray Wilson, consulting engineer and founder of Wilson & Co., Engineers & Architects.

In addition, six ex officio members were appointed, representing other political and business elements of the community who would serve as advisors to the council.

In the first days of the new year of 1965, the mood of the community was a mixture. A few Salinans appeared to be ready to panic, others were apparently turning aggressive, and the majority were in a wait-and-see frame of mind. The development council was preparing itself for the promised visit of Washington officials later in the month, fully realizing that Salina was facing a bootstrap operation. Above all, the new council in its formative meetings, foresaw months of work and the need for large measures of patience, fortitude, and wisdom. Whether the base closing was to be a disaster or an opportunity would depend in large measure upon an inventive, determined, and intelligent persistence of Salina businessmen and officials as well as upon the cooperation of the Department of Defense and other governmental agencies.

On January 13, 1965, a team of Washington officials, including representatives of DOD, GSA, DHEW, SBA, and Agriculture, began a series of day and night meetings that was to last for 2 full days. The Washington delegation was bolstered by a wide variety of regional representatives of Federal agencies, State officials, and envoys from the Washington offices of the Kansas Senators and Representatives. Don Bradford set the theme of the meetings when he reminded the press that the delegation was at Salina at the invitation of Salina's leadership:

We will sit down with these men and make an assessment of Schilling, and we will discuss possible recovery programs. We will enlist the aid of any or all Federal agencies to help bring new payrolls to Salina. We already have heard some good thinking from Salina leaders and we expect great results from our talks.

DEAR SAL: Here's hoping for the best.

Yours,

INA.

Salina had been promised active Federal assistance in adjusting to the loss of Schilling. The community had been told that redtape would be cut, sound advice given, advantages proffered, equipment donated, and that assistance would be offered to find new people and new payrolls to replenish those that would be lost. To many citizens these promises only mean nothing more than talk. The cynical element professed no faith in miracles or fairy godmothers, and cast suspicion on the professed desires on the part of Federal departments to help the community.

In the full meetings, and in the smaller meetings with special groups, the Federal delegation counseled over 150 invited Salinans in a wide variety of special interests and authorities. Groups interested in the municipal airport, education, highways, hospital and medical programs, housing, industrial development, parks and recreation, small business, urban renewal, public utilities, and vocational-technical education discussed the roles that might be played by the base in solving their respective needs and desires. Many of our questions remained unanswered but it was agreed that a number of worthwhile ideas and suggestions had been explored in detail.

As a climax to the visit by Washington officialdom, a report on the dialog between the community and Washington was scheduled for an evening meeting at the senior high school auditorium. All Salinans,

and the residents of surrounding cities affected by Schilling's closure, were invited to hear Mr. Bradford. The meeting had been scheduled at the request of the development council for the purpose of acquainting the general public with the problems that faced them. The wisdom of that request was debated at length in the weeks that followed. Nothing firm, positive, or concrete had been resolved in the preceding conferences. The talks had been exploratory only. No hard and fast conclusions had been expected from the meetings; only basic guidelines for Salina action were defined and established. In the minds of many, Bradford had been put on the spot. The theme "It's up to you," the refrain which was to become so familiar and No. 1 in Salina's own hit parade, was not what the audience expected to hear. The questions: Can we use it? Do we want it? Can we afford it? Awaited the community's answers.

"We don't have the brains and we certainly don't have the gall to say that we in Washington know what is best for Salina. The people who know that, are the people who live here." These words by Mr. Bradford were exactly the opposite of what many expected to hear. There would be no spoon feedings from Uncle Sam. There will be help and counsel. The leadership and decisions, however, must come from Salina. "Your first job is to establish goals for your community. This sounds easy but it isn't. It's a hard-nosed business and it involves all the segments of the community's economy. Don't get yourself in a hassle or in a struggle for power about this thing. That kind of fratricide will kill you."

In recounting the experiences and results of other communities faced with a similar problem, Mr. Bradford pointed out both successes and failures and his opinions for the variety of results. Salina leaders were praised by Mr. Bradford for sound, practical ideas and a dynamic approach to economic recovery. In congratulating the community on a most outstanding and successful start, and for the number of sound, practical ideas discussed in the work sessions, Mr. Bradford pointed out that he hoped that Salina's leader understood that they could not solve all of the problems of Salina's future in 36 hours of brainstorming, and that the community was aware that many months of planning and hard work would be needed to develop and carry out a total program. The community was assured that in their efforts they should expect the full support of all levels of government.

Sunday Journal Editor John Schmiedeler had this to say:

"Who wants to be master of his destiny?" "What did he say?" demanded these two fellows I know as they left Salina High Auditorium Thursday night. "You heard him. What did he say? We heard him and we can't tell you. It was just talk. It was the old kissoff."

Well, I'll go along just a short way. Don Bradford's talk before a concerned audience of Salinans was not a ringing climax to what had been the most stimulating—and, perhaps, the most important—day in recent Salina history. Perhaps by design, he underplayed it.

My friends probably wanted to hear the trumpets sound "Charge!" and the foe vanquished by the knight on the white horse riding across the Potomac. My friends might have been moved by an "Ad Astra per Aspera" speech or an "everything's coming up roses" declaration. But probably not. Skepticism is the vogue.

What they really wanted to hear is that Big Daddy's going to take care of everything and his pore li'l children won't have to turn a tap. And when Bradford didn't say that, they concluded he had said nothing at all.

What Bradford did say, while mild in tone and manner, is important. Here are some quotes my doubting friends can paste in their hats for periodic perusal while on pie-in-the-sky expeditions:

"We will help this community help itself."

"We don't know what's best for Salina. The people who know that are the people who live here."

"I'm enthusiastic about people, not procedures. We've found the type of people and the capability here that ends up in good results."

"You should start thinking about the long-term objectives of Salina."

What Bradford was saying is simply this: what happens to abandoned Schilling Air Force Base, for weal or woe, is squarely up to us. Despite the horror stories one hears about Federal bureaucracy shoving square pegs into round holes, Bradford and his fellows aren't in the least bit interested in force-feeding Salina.

They advise, they'll help and they'll point out possible pitfalls, and they'll cut redtape with great and good glee.

But the blueprint, the grand design must come from here.

If it upsets my skeptical friends to be masters of their own destiny, that's just too bad. Frankly, I like the feeling.

In the organizational meetings held by the development council, prior to the mid-January conferences with Federal officials, a lengthy list of objectives, both of a general nature and specific missions, and a preliminary procedural outline was discussed at length. The obvious needs for moneys to pay expenses of the council, the need for constant liaison with Schilling Air Force Base, the desirability of a coordinated procedure to handle publicity, the maintenance of constant contact with the Office of Economic Adjustment, the need for a permanent office space, and the immediate need for a full-time coordinator-consultant to man the council office were a few of the more urgent items that faced the group. Congressman Bob Dole's offer of space in his newly established headquarters in Salina, together with the services of his secretary, was quickly accepted. Suite 905 in the United Building, Salina's only skyscraper, was a most desirable location as a meeting place for the many businessmen and community leaders who would be involved in the council's work in the months that followed.

On the day prior to the arrival of the Washington delegation, Wilson & Co., Engineers & Architects, offered the services of one of their professional staff members to the council for a period of 3 months as a donation in the all-out community effort to plan an orderly transition of Schilling from military to civilian uses. Professional Engineer-Planner R. A. McAuliffe, has had considerable experience in the evaluation and planning of a number of Strategic Air Command bases throughout the United States, including the then current master plan for Schilling Air Force Base. This experience included knowledge of the availability of plans and data at the base and in the files of Wilson & Co. Wilson & Co. had also acted as consultant designers for a large percentage of the buildings and structures at Schilling, as well as for the airfield pavements, utility systems, and supporting facilities. This arrangement continued until April 1965, at which time the Department of Defense assumed the coordinator's salary expense for 3 additional months. Since that time, the expense of providing a coordinator has been borne by Salina.

During the month of January there was much evidence of a widespread intention of the people of the community to unite in support of the Schilling Development Council in the formulation of a plan to utilize the base for civilian purposes. Civic clubs, business associations, and individuals pledged their full support to the council. Many offered personal time and resources and many suggestions were received, as well as a wide range of personal opinions.

Salina city officials, with the full support of the business community, decided to schedule the bond elections for the city's share (\$1.1 million) of a joint county-city governmental center and a new police administration building and for a new public library (\$670,000). City officials had been encouraged by what they had heard from urban renewal representatives who attended the mid-January meeting. Urban renewal representatives were in Salina for a day-long series of meetings within 3 days after receiving a request from the city for a conference on the possibilities of urban renewal assistance. This was the first concrete evidence of compliance on the part of a Federal agency with the promise by OEA to do everything possible to assist the city in its recovery endeavors.

In a statement issued in late January, the Schilling Development Council said that its basic policy would be the use of the soon-to-be-closed base for industrial sites and related endeavors. In the council's opinion the creation of jobs and payrolls was most imperative. A local forecast of impacts that would result from the closing was loss of 32 percent of income, 25 percent of population, and some 3,900 vacant dwelling units—predictions that proved to be quite accurate. In the same announcement, the council reported that it would not rule out the other uses that had been suggested or that might be developed in the months ahead. In the group meetings during the mid-January conferences with Washington officials it had been pointed out that large areas, and particularly those in the residential, recreation, and community portions of the cantonment area, were best suited for educational and related uses. The award-winning new base hospital, and its related facilities, was most certainly best suited for medically associated uses. The council pointed out that education and medical development was in every sense an industry. They would create jobs and payrolls that would be equally important to those created by industrial and commercial organizations.

Much of the council office time was devoted to the development of detailed inventories of buildings, utilities and related facilities and in the preparation of maps of the base for use in the evolution of a master land-use plan. Until the inventory was completed, the majority of the local leaders did not fully realize the size of the facility, the numbers of buildings and structures, and the complexity of the installation. In cooperation with the chamber of commerce, a single page brochure announcing the availability of properties and listing thumbnail descriptions of the airbase buildings was prepared in great quantities and a mailing program was instigated through various committees of the chamber of commerce. The urgency of getting this information promiscuously scattered over the country was certainly overemphasized and the time and monies involved did little, if any, generating of industrial interest.

The council recognized the need for well-defined channels of communication between themselves and the public and appointed spokesmen to cooperate with the newspaper and the radio and television stations. The council also selected members to accept invitations to speak before the service clubs, association groups and similar organizations to keep the citizens aware of the activities of the development council.

By the end of January the base's military population had shrunk from approximately 5,000 to 4,200 men. The B-47 jet bombers were gradually disappearing from Salina's skies and the first of the Atlas

missiles was lifted from its silo and shipped to California. Salina's two hospitals began to feel the effects of the closure of the base with the loss of 25 percent of their registered nurses and nurses aids who were leaving town with their Air Force husbands. Similar losses were felt in the school system as teachers left; and in a multitude of Salina businesses as military part-time employees, and military wives and children left. While these losses were, for the moment, difficult to replace, there was a benefit in that movement of military-connected personnel from civilian jobs lessened the impact of the drop in economic activity upon Salina jobholders.

During January, representatives of various branches of the military began visiting the base in great number. As a result of these visits the community was subjected to many and varied rumors of base reactivation by these other branches of the service. Some of these rumors appeared to be quite factual and the development council hurried to check them out with the OEA staff in Washington. The rumors were to persist until June of 1965 even though the council had received a number of assurances from Washington that the base was surplus as far as the military was concerned. Cyrus Vance wrote that the Department of Defense had no plans to use all or part of the base but confirmed that several potential uses had been checked and had been found to be impractical. He assured the council that the findings of these visiting teams were negative in every instance. Despite these assurances the rumors were giving the council much to worry about. Civic leaders had agreed that the community would be better off in the long run to face the economic loss of the military rather than have another relatively short-lived military occupancy.

Early in February the community was contacted by the first of three potential Job Corps contractors. The development council advised each of these corporations that Salina was directing its efforts toward permanent payroll increases and therefore was not then interested in Job Corps use of the base.

Don Bradford, in the mid-January meeting and in subsequent conversations, had emphasized the need for Salinans to develop a use plan for the base—one which put in concrete form the community's objectives for productive civilian use of the facilities.

Early in February the first tentative land-use map was developed, together with a list of the facilities the council considered necessary to establish a new municipal airport at the base and including the supporting revenue-producing facilities. This tentative "save" or "want" list for the "airfield package" was developed in conformity with the preliminary proposals that were being prepared for a technical institute (13th and 14th years of school), the vocational-technical school (11th and 12th), and for a second campus for Kansas Wesleyan University. The history of the successful transition of the base from military to civilian purposes is, to a major extent, the story of the educational programs. The educational uses of the base are covered in detail in the appendix.

From the day of the closure announcement, Col. John F. Scanlan, the base commander, and his staff officers became intimately involved and concerned with the work of the development council. From the very beginning there was continued liaison and communications between the base commander's office and the Schilling Development Council and the Salina Airport Authority. Early in February,

Colonel Scanlan briefed the council on the procedures that were being initiated for early release of certain specific buildings and the problems that would be involved. The necessity to maintain security measures until the mission of the base was entirely phased out, as well as the possibility of early occupancy of certain buildings, was reviewed. In these early days of planning, Colonel Scanlan explained how base operations would be gradually withdrawn into smaller and smaller areas and into lesser numbers of buildings as these operations diminished. His announced plan to withdraw to the hospital area has proven to be well conceived and practical.

One of the first major tasks of the development council was to develop a means by which the city could acquire, own, maintain, operate, improve, and dispose of portions of Schilling Air Force Base. Kansas law had no provision for local governmental ownership and operation of surplus Federal facilities. Yet, Salina wanted to be the master of its own destiny—and, as a result, felt it necessary that a governmental body be empowered to deal with the GSA in the acquisition of the airport and industrial portions of the base.

On the advice of the Office of Economic Adjustment, the development council enlisted the assistance of a number of Salina lawyers to begin the drafting of acceptable enabling legislation that the Kansas State Legislature would be asked to adopt which would permit the city to create an authority empowered to acquire and control surplus real or personal properties of the United States, as well as to levy taxes and issue bonds to provide revenues. The legislation was developed from studies of similar laws in other States having communities where defense installations had been closed.

In mid-February, during a visit by a representative of the Office of Economic Adjustment, the development council was advised that in many respects it was moving too fast and that more effort should be directed toward the more basic determination of a land-use plan, the completion of a list of personal properties to be requested, and related basic decisions. Too much time and energy was being directed toward attracting industry and in following industrial client leads during these crucial planning months. The council was advised that these efforts were premature. No positive commitments could be made to prospective industries with respect to occupancy, availability, and many other essential considerations at that early date. The successes and failures of Salina's industrial development activities are the subject of a separate section of the appendix.

On the 25th of February, the last B-47 left the base and the first land use plan was presented to the community leaders for their review. The plan was reviewed in a series of meetings followed by a conducted tour of the base to acquaint the council and members of the city commission with the details of the plan. After making a few relatively minor revisions, the plan was adopted by all concerned and presented to the OEA for distribution to the Federal agencies that would be involved. The plan envisioned the use of the base as an airport-education-industry complex. The five part proposal involved:

1. The "airport package," including a municipal airport and supporting facilities.
2. The area vocational-technical school in a five building complex.

3. The proposed Kansas State University Technical Institute with supporting facilities.

4. Medical or educational use of the base hospital and community facilities area; possibly a second campus for Kansas Wesleyan University.

5. Sites and/or buildings for industry.

It was emphasized that the plan was still to be considered fluid and that the boundaries delineated on the maps were subject to change. The land-use plan, which would serve as the basis for negotiation with the Federal Government agencies in the purchase or transfer of surplus properties, was expressed in terms of "packages." The word "package" was adopted to describe the various proposed uses of Schilling. Assuming passage of permissive legislation, the Salina City Commission would create a public airport authority. This authority, or public corporation, would negotiate with the federal government through the General Services Administration to purchase that portion of Schilling which would be used as industrial sites. At that same time, the authority would take over at least part of the base for operation of a public airport. In the airport package would be considerable open land area and certain buildings suitable for lease for revenue-producing purposes. Rentals from these airport-associated buildings, plus regular airport revenues, would be used to maintain the airfield portion of Schilling. Chairman John Williamson cautioned that it was going to be a long, long road and that we must not give way to impatience. In his opinion the potential was worth the effort that the community must now make. If the community did not make the effort, a great opportunity would be lost.

The decision to utilize the airfield facilities at Schilling for a municipal airport was the nucleus of the land-use plan. Detailed engineering evaluations of the existing modern municipal airport were completed. Estimates of the cost for capital improvements that would be necessary at the existing airport in the next decade and at Schilling were prepared. Operating and maintenance cost estimates and comparisons were made for the existing airport and for the potential airfield facilities at Schilling. The decision to abandon the municipal airport and relocate that vital community facility to Schilling is also the subject of a separate section of the Salina story.

Senate bill No. 235, after intensive review by all parties concerned, was processed through the Kansas Legislature in the last days of March and early April. On April 11, Gov. William Avery signed the bill and the essential permissive legislation for the acquisition of the Schilling Airport and the supporting utilities networks was available to the city of Salina.

Prior to the announcement of the closure of Schilling Air Force Base, Salina had been struggling to work itself out of a surplus of housing (a 6 percent vacancy rate had existed as early as 1960). Over 1,000 new housing units, primarily single family residences, had been constructed during the early 1960's when the Atlas missile complex was being constructed and, after that work was completed, nearly a thousand units were left vacant.

The majority of the new residential construction had been in new subdivisions offering single-family units in the \$9,000 to \$18,000 range. Most of them were in the immediate vicinity of the base—an area which could have been sorely impacted were the adjacent 735 military

Capehart units to be placed on the market. Further, as a means of alleviating a serious housing shortage immediately after Schilling was reopened in 1952, over 600 units of low-cost marginal housing had been constructed in an area known as Indian Village. The majority of occupants, in 1964, were Air Force personnel in the lower enlisted grades. The combination of the above factors led to much concern among Salina leaders as to the impact of the base closing on Salina's residential housing market.

During the mid-January meetings, the Salina community was assured by Mr. Bradford that the Government would not add to the real estate problem by offering the 735 Capehart housing units that were a part of the Schilling complex. Local real estate interests were told that the conversion of these units to civilian occupancy would be delayed until the community had worked itself out of the already existing problem and the additional units that would become vacant because of the base closure. In the early months of 1965 the problem of what to do with the Capehart units became a much discussed subject of local conversation. Everyone, particularly those in governmental circles, agreed that the situation was not to be easily solved. As the reassignments of the military force to other bases accelerated the numbers of vacated Capehart units increased rapidly. Suggested uses for these fine residences included the development of a senior citizens community, a satellite residential community to Fort Riley, and for married student and faculty housing for the proposed technical institute and Kansas Wesleyan University. As early as mid-January the suggestion to use part or all of the 735 Capehart housing units as a government-operated housing installation, available to military families of servicemen overseas, was being debated. Officers and enlisted personnel were being continuously sent overseas for extended periods of duty. Quite often they were being sent to locations where there were no housing facilities for their families. This was truly a real problem because many of the wives and children had no place to go. Such use, it was said, would eliminate the need for military leaves while the men involved sought a home for the family, would eliminate worry for those unable to find housing, and would be a most appropriate use of a government investment of millions of dollars. Salina, with a school system geared to the Schilling population, could accommodate the students with no strain. The excellent school facilities at Schilling Manor could be kept open to take care of the children of the families of men who were on duty overseas.

In August of 1965, after review of the problem at Army, Air Force, and DOD levels, Colonel Scanlan announced that the DOD had directed the inauguration of a program which would open Schilling Manor to families of the military who were on overseas duty. Initially, Colonel Scanlan gave approval for about a dozen Fort Riley families to move into Schilling Manor as a test of such a program. By the middle of September over 50 families had moved into the available housing units.

On October 26th it was announced that the Army would take control of the entire housing area. Because it was a unique project, Washington said that the idea would be studied through fiscal year 1967 and, if successful, similar housing projects might be opened in other areas of the nation. On the 3d of January 1966, the Schilling Manor area became a subpost of Fort Riley and the Army took over the respon-

sibility of management. National publicity on network television and radio and in the major newspapers of the country gave Salina appreciated publicity.

The Salina school board, which had been responsible for operation of the Schilling Manor School, the largest grade school in the system, decided in August of 1965 that the school would not be reopened in September 1965. The projected enrollments dictated that it would be more economical to transport the decreasing numbers of military children to in-town schools and the school board received directives that the school equipment be released to other federally impacted areas. The popularity of the "waiting wives" program had not been anticipated. As early as February 1966, the Salina school board found itself with a school population explosion problem. As many as 50 new students were added in a single day. The problem of transportation to the city became a major undertaking. Although there are day-by-day changes in the projections, it is a certainty that the school population for the Schilling Manor School will exceed 1,200 in September 1966—the average family size is about five children per family—and in mid-summer 1966 there were some 500 families in residence.

The community of Salina warmly received these new residents in a number of ways. For example, the community donated \$1,000 to finance the start of a "Waiting Wives" Club. Activities were arranged for the wives as well as the children. Letters to the community from the fathers overseas expressed gratitude for relieving them of a major source of worry and concern.

In mid-April 1965, immediately following the passage of the enabling legislation, the Salina Airport Authority was created by the city commission and on April 26 five citizens were appointed to serve as directors. Named to the board were:

M. J. Kennedy, Kennedy & Coe, certified public accountants, who was selected as the airport authority's first chairman.

William Yost, field underwriter, New York Life Insurance Co.

Clifford J. Wertz, president, Consolidated Printing & Stationery Co.

Edward H. Bell, Bell Motor Co.

Allen R. Dodge, president, Homestead Building & Loan Association, who also had served on the Schilling Development Council.

By the 1st of May approximately 50 percent of the base personnel had been transferred to other assignments and the base phaseout was increasing in speed at every level to meet the official closing date of June 25.

On the 7th of May the newly formed Salina Airport Authority held its first official meeting. At this first session the authority was briefed by the development council members on the events that had taken place and the status of the various "packages." A lengthy list of problem areas in the coordination of the closure was reviewed in detail and the authority was advised of the complexity of these many matters. The airport authority devoted the next few weeks to preparing for a second visit by representatives of both the Washington and the Kansas City offices of the Federal agencies involved.

One of the more important problems that faced the newly formed authority was that of resolving a growing list of conflicts between the

"packages"—conflicts which needed to be resolved locally. Local leaders had been advised months before that no Federal agency would act as an arbitrator in a dispute between two different local interests. Because of a lack of full communication, conflicts had been developed between the Kansas Wesleyan proposal, the Schilling Institute proposal, and the municipal airport "package." The university was including areas and buildings that were also in the preliminary technical institute planning. Members of the industrial development committee of the chamber of commerce were showing buildings to prospective clients that were in one or another of the educational "packages," and equally serious variations of this general situation. In a series of meetings in mid-May these conflicts were eliminated and procedures agreed upon to prevent recurrence.

On 24 May 1965, Don Bradford led a large group of Federal officials from Washington and from the Kansas City regional offices in a 3-day series of meetings with base officials and community leaders. The No. 1 purpose was an attempt to set up a timetable for the take-over of areas of the base by the proposed civilian users. In substance, the only definite date decided upon was that of occupancy of certain buildings by the Vocational-Technical High School, which was committed to opening its doors on or before September 1. It was decided that an occupancy permit would be made to the Salina board of education by mid-July. Mr. Bradford told a news conference that he wished he could tell the community that the other "packages" were as close to reality. He commented that the disposal of a base as large as Schilling was enormously complex and that each proposal involved hundreds of details and many decisions. It was at this meeting that the community leaders fully realized a basic fact of life with respect to conversion of Federal property to civilian uses through the established procedures of surplus disposal. The community had, from the very day of closing, been directing almost all of its inquiries toward Washington. They, as they had been warned, became aware of the importance of the regional offices of the agencies involved in implementing the disposal procedures as set forth in the laws and regulations for such actions. While it was true that Washington approval was required in many instances, the fact remained that without regional approval our proposals would be of little value. Except for necessary liaison and communication with the Office of Economic Adjustment in Washington, the community leaders turned to the regional office representatives for assistance and advice.

The requirement that the entire facility be appraised by qualified appraisers prior to the transfer of any properties had been a subject of much discussion and, in the first week of June, that work began. In an effort to expedite this phase of the disposal procedures, the Airport Authority office assisted the appraisers in every way possible to bring that long and involved task to a quick conclusion.

Chapter IV

IMPLEMENTING THE CONVERSION PLAN

In June 1965 the mood of the community was changing and the authority members were spending more and more long days away from their businesses.

"You know," said an airport authority member, "I don't hear even the chronic crybabies crying any more. Perhaps they are afraid to, but I certainly don't hear them. It's been a lot of work, but it's been enjoyable. It's an education—every day is different. I don't want to sound stuffy, but you get a sense of accomplishment. You really do. I like to feel like we're doing something for the community. That makes the hours worth while. The big job still is ahead of us. What we have done so far is prepare for it. I'd like to stress the tremendous cooperation we have received from all public bodies and from private citizens as well. That's been most impressive to me."

With the official declaration of surplus announcement on the 29th of June 1965 came the realization that that milestone would increase the activity between the Salina institutions and the regional Federal offices. Everyone expected a blizzard of paperwork. The airport authority and the educational interests were developing a mountain of paper and were anticipating early decisions on the part of the Federal agencies. The first major development was expected to come from the Salina Area Vocational-Technical School. A detailed proposal to the Department of Health, Education, and Welfare had been completed and was under study in the HEW regional office. Farther away was the massive "airport package" which would involve the Federal Aviation Agency.

The man on the street was discussing the fact that Schilling Air Force Base was officially out-of-business as a fighting unit on the 25th of June. The revolving airfield beacon atop the watertower was dark. The control tower stood empty and the aircraft aprons were no longer filled with aircraft. The noise of power lawnmowers had replaced the noise of jet aircraft. The Schilling story, which began in the early days of World War II with a cluster of tar paper shacks, was concluded with the ceremonies involving the folding, packaging and shipment of a gold-fringed blue flag to Air Force archives.

However, on that day a new squadron unit was activated under the command of Colonel Scanlan. Not one hour was lost in the maze of work involved in the transition. The new command wasn't an impressive one, since it had no aircraft, no machine shops, no battle flag, and no combat mission.

On that day it was estimated that the closure and transition was approximately 6 weeks ahead of the original timetable. The commander's statement that he would try to keep the place cleaned up and in repair was carried out to the letter. Except for neatly placed "off-limits" signs and the stillness that prevailed throughout the next 12 months, the appearance of the base buildings and grounds was to remain excellent. Without exception, military and civilian visitors to the base—and there were hundreds—commented that there was no active military installation that could claim a higher degree of basic maintenance and appearance.

The activities of the airport authority and those of the other local institutions materially increased in the weeks that followed the declaration of surplus. On the 29th of June the Urban Renewal Agency granted the community funds for planning and reserved additional funds totaling nearly \$1 million for the anticipated development of a city-county government and Civic Center. This tremendous boost to morale was certainly significant. On the 2d of July the Air Transport Association released a report which said that

the existing Salina Municipal Airport was deficient in landing aids which added impetus and justification to the "airport package."

Less than 24 hours after the base had been officially declared surplus it was announced that the Kansas Highway Patrol would establish a training academy and a district headquarters in Minute Manor. Minute Manor, the former readiness bomber crew building used by the aircraft crews while on alert, was occupied under a temporary occupancy permit. The building was a part of the proposed "airport package" and the airport authority had agreed with State officials to arrange for a permanent lease when the building had been transferred to the authority. The structure, which cost almost one-half million dollars, was ideally suited for such usage. The peculiarities of its design would have made it difficult to find other appropriate users. The structure, most of it underground, is a two-story, air-conditioned, reinforced concrete facility with living accommodations for 70 men, including lounges, classrooms, dining room, kitchen, and built-in communication facilities. Its construction made it particularly desirable as a hardened site for highway patrol radio equipment, as a backup for the civil defense warning system, and as a severe weather information headquarters. Areas in the outlying reaches of the airfield pavements were available for pursuit driving classes and indoor and outdoor pistol and rifle ranges were also accessible to the patrol. On September 27, 1965, the first class of patrol recruits began study and on December 3, 1965, the first class of recruits was graduated.

The airport authority, acting as the coordinating body for all of the potential users of Schilling properties, had been advised in the very early days of conversion planning that it would be necessary to have a land survey made of the base so that the eventual property transfers and deeds could be prepared in conformance with all legal requirements. The sprawling complex of over 3,300 acres was measured and mapped for purposes of the military, but this information was not adequate for proper description in civilian property transfer documents. The streets, for example, would have to serve a number of users and owners, and logic dictated that a street system should be under the control of one public agency. A basic street system was therefore imperative, yet the existing streets were not defined by rights-of-way. There was need to consider the necessity of assigning easements and rights-of-way for both overhead and underground utilities and for the major drainage ditches which traversed the cantonment areas. The land-survey problem can be best described as subdividing in reverse.

The airport authority was advised by Washington officials that the survey problem was the community's, and that, despite its complexities and cost, the community would have to solve that problem itself. Early in July of 1965 the work was started as a joint project between the city of Salina engineering department and Wilson & Co., Engineers & Architects. The work was not completed until mid-April of 1966. The survey and platting, delayed to some extent during the winter months, cost the community approximately \$25,000 and is the largest single precise land survey ever accomplished within a radius of many hundred miles. The platting required 27 large maps to illustrate the area which has a perimeter of over 12 miles. In record time the platting was processed through city and county planning boards and commissions and was approved and registered at the local courthouse

on the 3d of May 1966. Immediate plans were then made to initiate the legal procedures necessary to annex the base to the city of Salina; a process which was completed in August 1966.

In establishing the platting of the base, it was necessary to rename the streets because they were duplicates of street names already existing within the city of Salina. It was suggested that the streets of Schilling subdivision be named for past base commanders during the days that it was a bustling Strategic Air Command installation. The list was long and when the final decisions were made, Mayor Waddell took it upon himself to inform each of the former commanders of the honor paid them.

The "Notice of Surplus Determination—Government Property," received on June 9, 1965, summarized the applicable regulations that provide that non-Federal public agencies shall be allowed a reasonable limit of time to develop a comprehensive and coordinated plan of use and procurement of surplus real property in which it might be interested. The notice further stipulated that the community's intentions were to be received in writing and filed with the General Services Administration within 20 days. On July 15, the Salina Airport Authority delivered its written notice to GSA. The letter stated that the Salina Airport Authority and its predecessors, the Schilling Development Council, had coordinated the planning of all qualified public agencies in the development of a plan of use for the entire Airbase, and that the planning had been coordinated with GSA, FAA, DHEW, and the Corps of Engineers. The total plan as of that date included the following proposed usages:

1. An area and six buildings for the establishment of an area vocational-technical school to be operated by the Salina school board. This proposal had been coordinated with the aforementioned agencies and had been formally submitted and approval granted and the school was expected to open September 1, 1965.

2. The State of Kansas Legislature had passed enabling legislation to permit the establishment of a technical institute for the State of Kansas at Schilling Air Force Base. A board of directors had been chosen and this board had selected a president for the new institution. A tentative proposal was being reviewed by the DHEW for their informal comments and recommendations. A formal application could be expected by August 1. This proposal involved two areas and a number of educational, residential, and student recreational buildings, as well as open, undeveloped areas.

3. A proposal was being prepared by Kansas Wesleyan University involving an area and buildings which would become a second campus for the university. This proposal could also be expected to be ready for submission within the month of July.

4. A proposal was being drafted by the Kansas Department of Vocational Education to utilize the hospital and related residential buildings as a state center for vocational rehabilitation. The area and the buildings involved in this proposal were in conflict with the Kansas Wesleyan University proposal. This conflict would, however, be resolved by the Salina community after consultation with the Federal agencies involved.

5. The Salina Airport Authority was presently preparing a proposal to utilize the major portion of Schilling Air Force Base

as the Salina Municipal Airport; including certain buildings and areas to be used in support of the municipal airport. This proposal was being prepared in consultation with the Federal Aviation Agency regional office and would be ready for formal submission within the month of July.

6. The Salina Airport Authority was also authorized to consider the purchase of land, buildings, structures that are not included in the proposals previously outlined for the purpose of industrial development. The airport authority requested that the GSA consider that the balance of surplus property not included in the above proposals be made available for purchase in the name of the authority; if the price for such property was acceptable.

This formal letter complied with the GSA requirement and outlined the community's intention of utilizing the entire Air Force base property, including certain essential off-base properties. Nothing said in the formal letter of reply was news to the Federal agencies involved. In the previous months there had been numerous contacts with these agencies and they were fully aware of the community's intentions. However, the formal reply had the effect of speeding the efforts to submit acceptable proposals to the Government. On the 11th of July, Kansas Wesleyan University submitted its revised application to DHEW. The technical institute, which by the wording of its enabling legislation had become known as the Schilling Institute, filed a formal application with DHEW late in July. On the 28th of July, the Salina Airport Authority forwarded its application to the Federal Aviation Agency proposing the utilization of Schilling facilities as a relocated Salina Municipal Airport. The vocational rehabilitation center application was submitted to DHEW on August 6. The proposal of the area vocational-technical school had had prior informal approval and was not required to resubmit a request for facilities.

The educational (area vocational-technical school, Schilling Institute, and vocational rehabilitation center) proposals, as well as the municipal airport application included requests for sufficient movable property and equipment to enable the activities to get started. These requests covered the gamut from beds to sophisticated airfield electronic equipment—and their fulfillment became a major task of the base commander and OEA in Washington. All recognized that Salina could not, while suffering the major business impacts, enter into a major equipment purchasing operation in order to get the new activities off the ground. Yet, Federal surplus property disposal procedures were comprehensive, complex, and time-consuming. A number of new approaches were adopted, with the OEA taking up the problem in critical areas. Among these were:

Early in the planning it was agreed that the concept of relating equipment to a building and its planned civilian use would be adopted. In this way, a lathe could be transferred to the vocational-technical school as a part of the shop training building. Both would be subject to a discount of up to 100 percent of fair market value. (It should be emphasized that this technique does not have the same attractiveness in the case where full market price must be paid, since much military equipment is not necessarily well-suited to civilian industrial and commercial use.)

The Schilling base commander innovated a system whereby all excess property was made available for review by civic officials

prior to its being placed in the regular disposal process. As a result of this review technique, some 111,269 items of equipment and other movable property was made available to the community.

Certain items were critical to the intended uses. These included snowplows, control tower and instrument landing facilities for the airport; dormitory and dining hall equipment for Schilling Institute; and machine tools for the vocational-technical school. In these cases, OEA interceded at the Washington level to insure that the judgment of senior Defense Department officials was applied to the problem. To the credit of these officials, the Salina Airport will have a full capability—and the schools are able to meet their initial needs.

The 10 months that followed turned out to be a most frustrating and seemingly endless wait on the part of the authority and the leaders of the educational institutions. Numerous revisions to the proposals were requested as well as supplemental data and documents. There were times when the community leaders had the impression that they were losing not only time but that there was serious doubt whether the proposals were acceptable. Despite assurances from Mr. Bradford of OEA, and other officials in high places in the governmental agencies, much local enthusiasm began to turn to dissatisfaction and doubt as to the success of the past months of work. "Promises—promises—promises—only promises." "Typical of Government." "We should have expected it." Cooler heads, in the minority, prevailed. The airport authority continued with the items of work involved in the transition that were not as spectacular as the major packages but most certainly vital to the total plan. A tentative draft of an ordinance to zone the area in compliance with county and city zoning regulations was adopted. A list of restrictive covenants was developed to be enforced to protect all potential users of the base. The complexities of the takeover and operation of water, sanitary sewer, electric, gas, and telephone utility systems was the subject of many meetings and conferences. The airport authority learned with a shock that it could not raise operating funds through taxation for a full calendar year because it had not been in existence on the last day of the previous year and that its only source of revenue would have to come from "no-fund" warrants. These and other developments, and occasional publicity releases to the effect that everything "appeared to be on schedule," helped ease the situation until early in September when it was officially announced that Westinghouse had selected Salina as the site for a major lamp plant. For a few short weeks, local pressure on the Salina Airport Authority was relieved.

On September 3 the airport authority was notified that FAA had submitted their recommendations to GSA approving the authority's proposal to establish a municipal airport at the base. The airport authority immediately forwarded a formal application for transfer to the General Services Administration. The application was expedited through the regional office of GSA and forwarded to Washington. The authority was advised that they could expect the application to be in Washington at least 30 days before approval would be granted. On that basis, the committees of the chamber of commerce, who had been in contact with a number of prospective industrial users of base prop-

erties, began quoting possibilities of occupancy by the first of the year to their clients. Formal approval of the airport package was not to come until February 14, 1966. During the intervening 5 months the community waited, and it was difficult to convince many community leaders that patience was in order. The airport authority had been intensively engaged in negotiations with the Beech Aircraft Corp. for months and had agreed on tentative lease arrangements early in December 1965. Beech executives had emphasized that occupancy beginning the first of the year was most important in their decision to open new facilities.

During the 5 months of waiting for the approval of the key package in the disposal plan, that for the airport, the airport authority could claim no important progress. The community as a whole was receiving a considerable amount of glowing publicity from many sources and the local paper and local radio stations quite regularly publicized the truly remarkable efforts of local citizens who had given of their time and money to the problem of base conversion.

An out-of-towner State official was quoted as saying that "the loss of Schilling has been the greatest thing that has ever happened to central Kansas." In his opinion, Salina's past interest in the base had reduced its interest in the welfare of the area. He was quickly refuted by Editor Austin who seriously doubted that Salina had failed its friends but that certainly it was not the fault of the Air Force.

On the anniversary date of the announced closing the Journal reviewed the accomplishments of the past year in a series of feature articles. "It Was a Crisp November Thursday the Day That Salina Changed Directions"—"Salina Didn't Roll Over and Play Dead"—"How Does a Proud Air Force Base Die?"—"Airport Authority Faces Complex, Exciting Task"—"Black Thursday Revisited"—"Year One AS (After SAFB)"—"There Are Spots of Life Where Students Study." In one article the Journal reminded its readers of OEA Consultant John Kavanagh's statement in the first meeting with Washington and regional representatives when he said, "Don't let this thing become a power struggle within your own community. That kind of fratricide will kill you." Such a struggle had not occurred. The opposite—a spirit of cooperation, an ingathering of the forces of the community resulted in a number of feature articles in major newspapers from coast to coast who saluted DOD officials and the community leaders for their actions.

On December 6, 1965, the community read with considerable interest of Secretary McNamara's announcement of additional closings of military installations. This time the headline, "Kansas Bases Escape Axe" was followed by a question mark and the miniature letter in the Journal said:

DEAR SAL: Well, at least Salina doesn't have to worry and wait any more.
Yours,

INA.

Salina could accept, quite dispassionately, the news that other military establishments would be closed. Editor Austin had this to say:

From the viewpoint of logic, Secretary McNamara is right. It might not be entirely premature to say that Salina also was right when the town agreed to roll over and say "Uncle" in return for federal help in converting those concrete acres to civilian usage. Protests would have only delayed the inevitable. Indeed,

delay might have put us into greater industrial competition. The logic of the Defense move is that even those B-52's, which we so fondly anticipated, are headed toward obsolescence and are wearing out their days over Vietnam.

With the turn of the year, the airport authority continued its efforts at the involved task of developing a police and fire protection plan for the long awaited day when that responsibility would become the community's. The problems of jurisdiction outside of the city of Salina, supporting taxation, and related elements of the problem were discussed at length with the Air Force, with the Army who had taken over the Capehart Schilling Manor housing area, with county officials, and with city officials. However, the record for January has little else to reveal than "no word yet on the airport package proposal."

Immediately following the announcement in early February that the airport package had been approved, there began a series of requests from the airport authority, and approvals by the General Services Administration, for occupancy of buildings and structure which were a part of the airport package. Within a few days, the airport authority, with the cooperation of the base commander, obtained permission to occupy the majority of the buildings in the airport package. Although public announcements of industrial development successes were delayed to coordinate them with the wishes of the clients, the next 2 weeks was a most important period of time in the Salina story.

On the 25th of February the airport authority made its first big announcement. The headlines that day announced that the Beech Aircraft Co. had leased five large buildings and hangars to be occupied by the 1st of March and that Beech expected to employ 500 persons before the end of the year. Almost lost in the publicity on the same day was a similar announcement that a firm involved in the production of mobile home components had also leased a building and that they too expected to begin hiring and would be in production within a few weeks. A week later it was announced that Funk Aviation had leased a building at the base for the production of crop-dusting aircraft.

"We've only scratched the surface," said Salina Airport Authority member, Bill Yost, at this week's announcement of the location of Funk Aviation Co. at Salina. "In the near future we will have more space filled, and that's what we need. We have some big things in the fire. We have more prospects on the list."

That was the tone of the press conference, set by men involved with the development of the Salina Airport Industrial Center, the name that had been selected for the sprawling complex. The community was asked not to expect the economic development committee to make announcements of that nature every week.

Salina Mayor Robert M. Stark said that he was not particularly surprised at the progress made in development of the industrial center and educational complex. "These announcements, such as made by Beech, Funk, and Custom Metals within the past week, have only come about by a lot of hard work by a lot of people." Jim Trickett, the industrial development director of the chamber of commerce, said, "Two national firms (Westinghouse and Beech) in the top 500 firms in the country have been attracted to Salina in the past year. I feel we have been very lucky."

Despite the accomplishments with respect to industry and the usage of the buildings in the airport package, the airport authority was devoting much of its time and energy to an equally important problem

which had not been solved. The proposal which would establish Schilling Institute and utilize a major portion of the residential and community areas of the base had yet to be approved. Our industrial contacts and clients had been sold on the potential of the industrial center on the premise that there would be a technical institute in addition to the already established vocational-technical school. The trials and tribulations of the Institute had been numerous. The scope of the institute package had been revised, changed, and supplemented over and over again to conform to the recommendations of Washington and Kansas City officials of DHEW, and as dictated by changing emphasis within the State of Kansas itself.

The problems of the institute were not all the result of Federal direction or requirements. The institute found itself embroiled in a statewide controversy which at times seemed to threaten the very start of the institution. The role of the institute was certainly misunderstood by all of those who rose to oppose it. As might be expected, the objections came from persons involved with the junior colleges of the State and those who were involved with the area vocational-technical high schools, and were being generated by fears that Schilling Institute would be requesting and receiving state educational moneys at the expense of their own institutions and programs. In making these objections the spokesmen unfortunately revealed that they were not conversant with, nor did they understand, the purpose and role of an institute of technology. The basic concept of the institute had escaped them.

In May 1966, the institute had over 30 employees yet they had not received official approval of the plan to establish a State-sponsored institute of technology. However, the dam was broken in early July with the granting of rights-of-entry to both the institute and the vocational rehabilitation center. Final conveyances took place in August 1966.

Chapter V

SALINA, MID-1966

Only the first few chapters have been written of the Salina story. As of this hour, Salina's industrial pot is simmering. Craddock Uniforms have leased three buildings for the production of nationally known ceremonial and school band uniforms. Production of home moisture control equipment and of artificial marble began within days after the properties became available at the base. The first Beech King-Air rolled off the modification line on April 20. The Beech Aircraft Corp. exercised an option and rented three more principal buildings at Schilling for increased production at the new Salina Airport Industrial Center. A major seed company initiated a regional distribution center in a large base warehouse. A distribution center for wholesale frozen meats and produce will soon occupy the cold storage warehouse. And on July 14, 1966, the Salina Municipal Airport moved to new quarters at former Schilling Air Force Base. Renovations to the former base operations building had been completed to make it Salina's temporary municipal airport terminal building. Plans are envisioned to build a new terminal as soon as practicable.

If the Salina story was limited to the recounting of the successes and failures in the community's efforts to convert Schilling Air Force Base to civilian usages it would not be a complete record of accomplishment; nor would it reflect a very dramatic change in community attitude. Despite the irony of the slogan "City on the Move," while our Air Force friends were moving away, the city is truly on a comeback trail. The evidences of this condition are many and there are no apparent signs that the enthusiasm is waning or that important developments are declining. Salina can proudly say that it did not roll over and play dead. The Statler-Hilton Inn, a striking and sprawling complex in downtown Salina, will be under construction in a few weeks. Construction contracts have been let and the block-long site has been cleared. A large percentage of its cost will come from local sources. The citizens of Salina, only a few months after the announced Schilling closing, voted a two-to-one mandate for the construction of a new combination county courthouse-city hall-governmental center and new city library. The vote was taken on the stormiest day of the winter and was the largest in history for a special election. This project became involved with the urban renewal program and the clearing of a two-block downtown area will soon begin. A second urban renewal program will soon be finally approved enabling a local industry to accomplish a major expansion. Plans are being developed for a downtown multi-story office building. Building permits for commercial and industrial construction within the city itself are at an all-time high. At least three dozen business establishments have completed or are in the process of completing major renovations or new structures. The spirit hereabouts is one of determined optimism born by adversity. Salina's unemployment level, while slightly higher than a few years ago during the glorious days of boom, is below State and National averages. Westinghouse ballooned Salina's hopes and there are current rumors that their initial program will be expanded. The reason Salina can look forward to good years ahead is directly related to the spirit of zeal, efficiency, and capability of all the citizens who were so willing in giving their time in the transition period from a military to an industrial economy. Not surprisingly, some three hundred people are actively engaged in work on various boards, commissions and committees. These people, without exception, are capable, willing, and have had the right kind of experience to make a splendid task force for the work that has been done and will be done in the future. Retail sales are up, people are spending money and bank clearings and deposits have been showing increases over previous years.

Salina is on the Move!

"I don't know if your people know this," said Bradford, whose Office of Economic Adjustment provided early and continuing advice and encouragement following the Schilling closure, "but this has been a remarkable feat. I cannot say enough about what this community has accomplished and will accomplish. I use you all the time as an example to other communities facing similar problems."

APPENDIX A—THE EDUCATIONAL USES

It would be virtually impossible to recount the development of any one of the four proposals which were submitted to DHEW without continual reference to one or more of the others. The one exception to this generalization would be the proposal for the Salina Area Vocational-Technical School. From the very beginning of the development of a land use plan for the base, and lasting through the first nine months of planning, the other interests were in competition with one another for the buildings and acres of Schilling. Even the names of three of the institutions seemed to overlap. It still is not an uncommon request to explain the difference between the area vocational-technical school, the technical institute, and the vocational rehabilitation center. In more recent months the Institute is being referred to as the Schilling Institute, rather than the technical institute, which has helped to relieve the confusion. Unfortunately, however, some confusion still exists, particularly in other areas of the State of Kansas.

AREA VOCATIONAL-TECHNICAL SCHOOL

Early in 1964 Salina was included with a number of other larger communities in the State of Kansas as a site for the development of a vocational-technical high school. The statewide plan envisioned these schools as serving areas larger than any single school district. The Salina board of education, acting through Superintendent Walter Ostenberg, was completing the preparatory work necessary to schedule a bond election for construction of the facilities when the announcement of the Schilling closing was made. Ostenberg quickly realized that it would be reasonable to expect that surplus governmental buildings and equipment could be made available for such educational usage. Within a very few days after the announced closing, preliminary contacts were made with DHEW officials in Washington and he was assured that, if the base was considered surplus by other governmental agencies, an application from the Salina school board would have high priority.

Prior to the mid-January meetings with Washington and Kansas City officials, the school board had surveyed the base and were unanimously in favor of requesting that a complex of three buildings be acquired for the purpose of establishing the area school. This head start is emphasized by a quote from the minutes taken at the meeting in mid-January with the Federal officials. "The discussion was primarily concerned with the vocational training school. Representatives from Bethany College, St. John's Military Academy, Marymount College, and Kansas Wesleyan University were left largely to our own devices." After pointing out that the school board had surveyed and recorded listings of personal property and equipment, and had picked out several buildings for the purpose of determining their suitabilities for a vocational school, Mr. Ostenberg asked when the board of education might expect to obtain possession of buildings. Dr. George Decker, of DHEW, suggested that the request must generate from the local community as it developed approved plans. Only then could a specific date be established. Mr. Bradford then pointed out that the vocational-technical committee needs must be

approved by the overall community planning group. He emphasized that it was important that the vocational-technical proposal be part of the total planning. Only when that was done, would the proposal be given any positive action and approval.

It was in that meeting with the educational interests of the community that Mr. Bradford first laid down the rules that would become so familiar with respect to the availability of furniture and equipment to outfit the buildings. Mr. Bradford promised that such surplus property would be made available with the buildings unless it fell within one or more of the following categories:

An item essential to a mission of the Air Force being relocated from the base;

An item that was on a Department of Defense "need-to-buy" list; or

An item purchased with nonappropriated funds.

Mr. Ostenberg advised the Federal delegation that the school board was committed to begin classes in September of 1965 and asked if it might be possible to acquire surplus Schilling facilities in advance of that date. Mr. Bradford's reply was that, if base officials could make them available, it would be possible to receive permission for occupancy on or about June 1, 1965.

School officials immediately began the task of preparing a formal proposal, including in it a list of furniture and equipment which they would need to outfit the new school facilities. On the 25th of February, Mr. Ostenberg presented the vocational-technical school proposal to the Schilling Development Council for their approval. The council unanimously approved the suggested usage and advised OEA of their action. On the 8th of March, Ostenberg reported to the board of education that Federal officials had informed him that the proposal for the vocational-technical school was the best prepared proposal they had seen. The proposal had been hand-carried to Washington for informal review. He further reported that they had been told they might obtain a right-of-entry so that occupancy of base facilities could be made by June 30.

Washington and Kansas City officials made a special visit to Salina in the last 3 days of March to discuss the vocational-technical school proposal and other packages being prepared for their consideration. It was at these meetings that the local school officials were told they would receive a permit of occupancy not later than June 15th so that the school staff could move in for renovation and installation of equipment in preparation for the September 1 opening. Colonel Scanlan advised the 15th Air Force and SAC Headquarters that the buildings requested could be made available. On the 29th of April, Superintendent Ostenberg, in a letter to Colonel Scanlan, officially requested occupancy permits for three of the principal buildings in the vocational-technical school package. Colonel Scanlan attached copies of Ostenberg's letter to his own letter to SAC Headquarters in which he—

strongly recommends that appropriate outgrant be authorized so that these three facilities can be made available to the Salina board of education—if these buildings are to be made immediately available, special expedited handling must be given this correspondence. The Corps of Engineers can start action, with GSA concurrence, upon receipt of SAC approval of availability of these buildings. This request for an outgrant is in itself, under present circumstances, an exception to normal procedures. Therefore, it appears that the appropriate agencies and the Department of Defense, at Washington, D.C., level, would need to fully coordinate this and provide their agencies at local level (GSA, DHEW, and

Corps of Engineers) specific instructions to cover this particular situation. If, for any reason, an appropriate outgrant cannot be made available immediately, the Salina board of education must be so advised.

It was not until a second visit by a large delegation of Washington and Kansas City Federal officials late in May that a definite occupancy date was established. At that meeting, chaired by Mr. Bradford, it was established that the buildings and equipment for the area vocational-technical school would be assigned to the Salina board of education by July 15. Although almost a month later than the earlier assigned target date, it was the first of the disposal packages which had become a reality. When the long awaited announcement was made on the 13th of July that the transfer would be effective on the 15th, Superintendent Ostenberg assured local citizens that he would have plenty of time to get everything ready for September. At that time he had his core requirement of three buildings and some 10,498 items of equipment including a completely equipped machine shop.

The new school opened its doors to over 200 daytime students, and ever-increasing enrollments in post-high-school and adult night courses, exactly on schedule. Its success is a matter of record. The first class was graduated in May 1966.

SCHILLING INSTITUTE

In a number of studies completed in the decade preceding the announced closure of Schilling Air Force Base, various advisory educational groups had called attention to the lack of opportunity to receive a technician-level education in the State of Kansas. State and local societies of engineers and technicians had also been pointing out the serious lack of technical education opportunities for the citizens of Kansas. The studies further indicated the serious shortage of properly trained technicians. Attempts to obtain the necessary funds to establish a technical institute within the State were lost in the clamor for those same dollars by the existing institutions of higher learning.

With the announced closing of Schilling a few local individuals, aware of this problem in the State, began discussing and exploring the possibilities of the usage of Schilling facilities. In early January of 1965, President Dr. James A. McCain, of Kansas State University, wrote the Schilling Development Council and offered the services of the university to assist Salina in the program of economic recovery. In replying to Dr. McCain the council advised him of the scheduled mid-January meetings with governmental officials and suggested that the university might send people to learn firsthand what might be available at Schilling for technical school purposes.

Dr. Paul E. Russell, dean of the Kansas State College of Engineering, his assistant Prof. Henry M. Neely, Jr., and Prof. Thomas F. Creech immediately began a survey and inspection of the available facilities and their adaptability for the laboratories and classrooms that would be necessary at a technical institute. This team of engineering educators enthusiastically reported that the potential exceeded the basic criteria by many fold. The fact that hundreds of items of equipment and furniture would be declared surplus and would quite likely be made available to the school, added to their enthusiasm. At the mid-January meetings it was publicly announced that Kansas

State University was interested in establishing a technical institute at collegiate level in facilities at the base. Mr. Neely and Mr. Creech began spending almost full time inventorying, evaluating, and in the preparation of a tentative proposal for the establishment of a State-sponsored technical institute.

When the initial five-package utilization plan was presented to the public in mid-March, institute planning had progressed to the point that justification had been developed for some 95 acres of land and two complexes of squadron headquarters buildings, shops, dormitories, dining halls, and student recreation buildings. Local citizens, the development council and the K-State sponsors realized that the success of the proposal would require the acceptance of the idea by the Governor, the State legislature, the board of regents, and numerous other State and Federal agencies.

Speedy action was obviously paramount and an attempt to get at least tentative commitments from these groups had to be made within a very few weeks. In the discussions with State officials, it was most important that the sponsors be able to say with positiveness that the proposal would meet the requirements of and would be acceptable to OEA, DHEW, GSA, etc. The terms of such a transfer had to be clearly defined and understood. The policy with respect to availability of surplus equipment and furniture would also be of considerable help in the efforts to expedite State approval of the proposal. Armed with this information and many other supporting facts, the community of Salina, with the full cooperation of Kansas State University staff people, began an organized campaign throughout the State gathering support for the proposed institution.

The Kansas State Engineering faculty envisioned the school as a 2-year post-high-school institution offering an associate degree of technology in a number of programs. Initially the plan further contemplated curriculum in six programs.

Aeronautical technology.

Civil technology.

Design and detail technology.

Electronic technology.

Electrical technology.

Mechanical technology.

The program would be expanded as dictated by the requirements of industry in Kansas and in the surrounding States. It was pointed out that only two similar institutions existed within a radius of three or four hundred miles.

Nearly everyone agreed that it was a splendid idea. The Governor said so. The board of regents said so. The engineering societies said so. The chambers of commerce and industrial development groups said so and so did a great many other organizations and individuals. The only trouble was that no one at the capitol seemed to want to put up the money; a matter of less than \$200,000 initially. Without the appropriation, both the institute and the potential Federal grants of surplus property and continuous supporting funds would be lost to the State.

Salina civic leaders, area political leaders, industrialists from around the State, consulting engineers and architects, and aircraft company executives descended upon Topeka in mass, in person, by mail, by telegram, and by phone call. Professional lobbyists were amazed

at the somewhat amateurish approach and its signal success. On May 13, 1965, upon publication in the Topeka Daily Capital, house bill 1101 became law and the technical institute was born under the name of Schilling Institute. The legislation provided that the new school would be administered by a "State education authority" consisting of three members. Dean Paul Russell, the institute's first pioneer, was selected by Governor Avery as one of the three members to administer the affairs of the new school. Henry Neely was appointed the institute's first president and Tom Creech, in turn, was selected by President Neely to be the institute's first academic director. By these appointments, the continuity of the planning and developing of Schilling Institute was assured.

Mr. Neely, using a desk in the airport authority office, began the complex and involved task of organization which was directed toward the opening of the Institute in September 1966. The formal proposal grew from some 40 pages of explanation and justification to a document with over 500 pages. Dozens of meetings at Washington, at Kansas City, and at Salina were held. The listing of support equipment and furniture, made available by DOD, grew to 78,039 items.

While these efforts and contacts with the Federal agencies were being conducted, the institute was faced with problems within the State as well. The leaders of education throughout the State, particularly those concerned with junior colleges and the area vocational-technical schools, voiced objections to the establishment of the institute and based their statements on the misconceived idea that the institute would be duplicating the educational opportunities available at their own institutions. Basically however, it was evident that they were anticipating loss of dollars because of the new school. The staff of the institute was slowly and systematically increased and all of its members took turns in visiting the hundreds of high schools throughout the State to bring the story of the institute to the 1965 high school graduates and to their counselors. Locally, the institute had to resolve the conflicts between their needs and those of Kansas Wesleyan University for buildings and areas at the base. The institute was also preparing a proposal, and appropriate justification, for one of the surplus Atlas missile sites located a few miles north of Salina. This complex of mechanical, electrical, electronic, and environmental equipment was surely a most desirable laboratory for advanced students of the institute.

President Neely and his staff were continually emphasizing that the institute was not a Salina institution but a State institution. The staff was also proving to the State that the institute program was not in any way a duplicate of that offered at the junior colleges or at the vocational-technical schools. Despite the efforts and recommendations of Governor Avery, the Institute budget was reduced by \$193,000 forcing the institute to reevaluate its initial program.

Although the Schilling Institute Story abounds with the recounting of problems and obstacles, it truly is a story of monumental success. The delays in getting formal approval from the Federal Government were frustrating. However, on July 18, 1966, the institute became a reality at Schilling with the raising of the National and State flags in front of the administration building. Plans are now firm for an initial enrollment of 250 students in September 1966 and the imple-

mentation of programs in aeronautical, civil, computer, electronic, and detail and design technologies.

With a projected enrollment of over 2,000 students within the next 5 or 6 years, Salina community leaders and the Salina Airport Authority consider the institute to be a most promising major "industry". Kansas now has its long needed and sought after technical institute.

VOCATIONAL REHABILITATION CENTER

From the first day following the mid-January meetings in 1965, a small group of citizens led by Charles Waeckerle, a local financing and investment company official, had been devoting their time and energies to find a medically associated use for the base hospital building and its supporting facilities. It had been concluded that neither of the two large, modern and recently expanded Salina hospitals could economically add the facilities to their purposes and it was further concluded that the community did not need a third general hospital.

On that premise, the committee contacted every State, National, Federal, and private institution that could conceivably use the facility: Heart and cancer treatment and research organizations were contacted; the Shrine, as a children's hospital; the Knights of Columbus, for similar purposes; United Commercial Travelers; Kansas University Medical Center; the Menninger Foundation; Mayo Brothers; and a number of other similar institutions. The answers received in every instance, particularly after representatives had visited the base, were that the hospital certainly had great value but its location in central Kansas, the lack of funds, the distance from other high-level medical centers and combinations of these reasons made it impractical for them to consider the matter further. Many of those directly connected with the problem feel that there should be some systematic method of making all public and quasi-public agencies aware of the availability of superb surplus medical facilities.

However, the efforts of Mr. Waeckerle and his active committee did finally bear fruit. In mid-June of 1965, a chance contact with a representative of the Kansas Vocational Rehabilitation Advisory Board, by a Salina doctor, quickly developed into a potential medically associated use for the hospital facility. Roger H. Triplett, State director of the Kansas Division of Rehabilitation, was invited by Waeckerle to visit the facilities and, after the initial tour in late June, Triplett wrote that the facilities would be ideal to provide the comprehensive and specialized services needed by many of our disabled in Kansas. He pointed out that Salina, centered in the State, is easily accessible from all parts of the State and that the buildings were ideally suited to the rehabilitation program. Triplett also mentioned the availability of the area vocational-technical school and the Schilling Institute for rehabilitation training. Triplett requested an expression from the city of its desire to obtain a rehabilitation center and the city's willingness to cooperate with such a project. At a hurriedly called meeting attended by more than sixty members of the economic development committee of the chamber of commerce, he had his answer in an unanimous endorsement. There followed the need to obtain approval of the proposal from both State and Federal officials, a program which was vigorously pursued. On August 6, 1965, a formal request was made to the Department of Health,

Education, and Welfare and on the 14th of September the Salina community was advised that the application for the hospital and related facilities had been tentatively approved. This program of giving medical treatment, vocational and medical evaluation, counseling and guidance, vocational training, and other needed services to men and women injured in industrial accidents or otherwise physically handicapped will be initiated in the fall of 1966.

THE HIGHER EDUCATION CENTER

During the review of the Schilling Institute request for facilities at the Base, it became apparent that there would be sufficient facilities for both the institute and a proposed center for higher education. As a result, Dr. James A. McCain of Kansas State University, acting in his capacity as chairman of the extension commission of the State board of regents, requested that President Neely of the Schilling Institute set aside a portion of the institute area for a regional director of industrial education and programs set up under the "Title I, Community Services," portion of the Higher Education Act of 1965. The effect of this action was to establish, an educational complex ranging from the high school through university graduate levels at the base.

The higher education programs will be developed around community and State needs. Initially, emphasis will be in terms of business, industry, and technological needs. The six Kansas institutions of higher learning will coordinate their programs on the Schilling Institute campus through their extension divisions. State, Federal, and private financing will provide the operating and research funds as required.

These new programs in higher education will bring professional and technical leaders to the community.

Initial efforts to establish and fund these new programs, within the institute complex, are being made as of this writing.

KANSAS WESLEYAN UNIVERSITY

Kansas Wesleyan University, offering a 4-year liberal arts program, is a long-established and valuable asset to the city of Salina. In recent years the enrollment at KWU has been gaining at a rate nearly matching the other colleges and universities of the State; increasing at approximately 10 to 20 percent per year.

In the months preceding the announced closing of Schilling Air Force Base, KWU officials had been studying the physical plant problems resulting from these enrollment gains. The university was land-locked by valuable residential and commercial development. There was need for new student housing, a new science building, a new library, and additional classroom space. The campus consisted of only 24.5 acres of land. It was concluded that, although very convenient and attractive, expansion into contiguous areas might be prohibitively expensive.

With the Schilling closure announcement, Dr. D. Arthur Zook, president of KWU, immediately became interested in the possibilities of establishing a second campus at Schilling. In the weeks preceding the mid-January meetings, he and members of his staff surveyed and

evaluated Schilling buildings and areas and developed considerable interest in pursuing the possibility that an area in the southeastern corner of the base might be desirable for a second campus. The area encompassed the hospital, gym, three bachelor officers quarters, the nurses residence, officers club, community center, chapel, theater, and a number of dormitories and supporting dining halls. In reporting this interest at the mid-January meetings, Dr. Zook commented that the university understood that medical or medically-associated interests might preclude the use of the hospital by any educational institution but that KWU was interested in pursuing the matter even though the "package" would be somewhat less attractive to them if the hospital was not available.

In late January 1965, Dr. Zook presented the university's tentative plan to the Schilling Development Council. The discussion that followed was centered primarily on the financial aspects of the proposed campus and the ability of the university and its many supporters to see the plan through. At that date there was no appreciable conflict between the proposed Kansas Wesleyan University campus and the proposals of the other educational users. The council elected to take the matter under advisement and suggested to Dr. Zook that he continue the development of a formal proposal. In mid-February, Murray A. Wilson, a member of the council and a long-time supporter of the university, asked the council for its stand on whether or not they would look with favor on a study program which would include an exhaustive evaluation of the Wesleyan proposal. This study would be conducted by a branch of the Ford Foundation, well qualified to appraise the situation. Mr. Wilson was advised that the council was certainly in favor of such a study and that they saw much value in determining whether the idea of a second campus was feasible or desirable.

Hare & Hare, consulting planners and architects of Kansas City, Mo., were engaged in support of the Ford Foundation program and their preliminary report was made available in May of 1965. In the intervening weeks, Dr. Zook had been in contact with Washington officials of DHEW and had presented a preliminary proposal to them for their comments and review. The Hare & Hare report, documented by appropriate data and maps, proposed a second campus area that included buildings and areas in the Schilling Institute package and areas that were proposed to be in the municipal airport package.

The Salina Airport Authority was forced to assume the responsibility of arbitration. In mid-June a compromise was reached by all concerned and the conflicts appeared to be resolved. However, on the very day of that arbitration meeting, representatives of the vocational rehabilitation office at Topeka visited the base and, within the next few days, the tentative vocational rehabilitation center proposal became a major conflict with the Kansas Wesleyan University package.

The role of arbitrator again fell on the members of the airport authority. Quite factually, the situation was the only real sour note in the tune Mr. Bradford had named, "It's Up To You". The community leaders were certainly divided on the matter but a substantial majority were in favor of the establishment of the vocational rehabilitation center which was proposing to use the very heart of the Kansas Wesleyan University area.

Despite the conflict, the Kansas Wesleyan University board of trustees voted unanimously to apply to the Department of Health, Education, and Welfare for more than 150 acres in the southeast corner of the base. Their decision to make application was drawn from several sources. The Hare & Hare feasibility study, which covered the adaptability and cost of renovation of existing buildings and a cost analysis of operation, was coupled with the projections by college authorities for the next two decades and a detailed study of the plant requirements of the immediate future. The university also had the advice of several outstanding educators, including some of the country's foremost campus planners.

The Wesleyan proposal was in complete detail and a usage plan for all of the area and all of the buildings was included. A few days later the Central Kansas Conference of the Methodist Church approved the university's plans for a second campus by a substantial majority.

The controversy continued for several weeks. The Kansas City office of DHEW had two applications involving the same areas of the base. In evaluating the program the regional representative of DHEW did not believe that the program set forth by Kansas Wesleyan University would warrant a public benefit discount of 100 percent, but would be entitled to something less than a 100 percent. As a quasi-public organization they would not have the priority that the State-Federal usage as a vocational rehabilitation center would enjoy.

Hopefully, the Salina Airport Authority attempted to come up with a compromise to the roadblocks that had been confronted by the university officials. A large part of their present campus was occupied by a football stadium, track, and playing fields. The airport authority suggested that these areas might become available for expansion of the university if replacement areas were available at the base. It was pointed out that base athletic fields and playgrounds already existed that could be easily made available to Wesleyan. These efforts bore no fruit. On the 24th of September, the Kansas Wesleyan University Board voted unanimously to withdraw their entire application, including the possibility of obtaining space for an athletic stadium.

The Kansas Wesleyan University chapter of the Salina story does not end with their loss of Schilling Air Force Base facilities. Enrollment again increased in September 1965 and, as of this writing, plans for the construction of a new science building, a new residence hall, and a new library are being completed. The university is in the midst of a fund-raising campaign to meet matching-fund requirements. Their goal of \$400,000 is approaching fulfillment.

APPENDIX B—THE NEW SALINA MUNICIPAL AIRPORT

The current chapter of the story of the airport package was concluded on the 14th of July 1966. On that date both private and commercial aviation moved from the old municipal airport to Schilling Air Force Base. The airport story began almost immediately after the announcement from Washington that Schilling would be closed. Local flying enthusiasts, and all of those interested in general aviation, hoped that the beautiful long runways at Schilling were not to be forgotten in the scramble to utilize the facilities after the scheduled closing. It was admitted that Salina had a marginally adequate airport but it easily could find itself in the enviable position of having

superb facilities. All, or at least the majority of the community leaders, realized that Schilling's runways were long enough and tough enough to handle any commercial aircraft in existence. If the city was to continue to grow, which they felt it would in spite of the temporary setback, airport facilities would play an increasingly important role in the community's economy. The Schilling runways and aircraft aprons could be a priceless asset. With the availability of the base, Salina would have the potential to become a terminal city on interstate routes of an aerial nature as well as being at the intersection of two interstate highways. Those individuals actively engaged in the industrial development activities of the chamber of commerce were visualizing a solid row of aviation associated industries down the east side of the Schilling aircraft aprons.

The Schilling Development Council, in cooperation with City Manager Norris Olson, arranged to have an engineering study and evaluation made of the existing municipal airport and a similar study of the airbase facilities. The studies compared operating and maintenance costs and included preliminary engineering estimates of the cost of the capital improvements that would be required within the next few years at each of the facilities. A recapitulation of the results of the studies is shown in the following tables. Only the principal items are shown.

Capital improvements costs

Old airport		New airport	
Extension of north-south runway	\$70,000	Relocate hangars.....	\$45,000
Land for north-south runway extension.....	55,000	Relocate beacon and wind cone.....	1,000
New clearance easements.....	11,700	Floodlighting south apron.....	4,300
Rerouting Crawford Avenue.....	80,000	Modify airfield lighting.....	11,500
Additional taxiways.....	20,000	Modify runways and taxiways marking.....	18,400
Additional runway lighting.....	9,000	Taxiway and apron repairs.....	5,000
Paving northwest-southeast runway.....	292,000	New T-hangars.....	60,000
New taxiways.....	27,700	Remodeling of base operations building for terminal use.....	25,000
Expansion of terminal building.....	43,500		
New fire station.....	30,000	Total.....	150,200
Additional parking lot.....	6,750		
New maintenance hangar.....	120,000		
Relocate powerlines.....	85,000		
Total.....	850,650		

Yearly operating and maintenance costs

	Old airport	New airport
Salaries.....	\$30,000	\$45,000
Utilities.....	6,000	15,000
Insurance.....	4,500	11,000
Building repair.....	2,200	5,000
Equipment repair.....	2,300	5,000
Snow removal.....	1,500	5,000
Pavement maintenance and repair.....	8,000	26,000
Total.....	54,500	112,000

In conjunction with that study, the development council office was preparing a tentative listing of the facilities at the base that they considered to be either necessary or desirable if it were to become the municipal airport. During the preparation of this listing, a very basic and fundamental concept of the future of the base was established. It was apparent that one single governmental agency would have to

take the responsibility for the continued operation of all of the services that would be vital to the overall occupancy of base properties. Under this concept the list of facilities became quite lengthy. It obviously included all of the runways, taxiways and aprons, aircraft fueling systems, airfield lighting, weather and communication facilities, navigational aids, and similar items essential to the airport itself. The list of supporting facilities was almost as long. It included the water supply, treatment, transmission, storage, and distribution facilities; the sanitary sewerage collection and treatment facilities; the industrial waste treatment facility; on-base railroad trackage; on-base streets and street rights-of-way; overhead and underground utility line easements; electric power primary and secondary distribution systems; the street lighting system; the natural gas distribution system and the government-owned portions of the telephone system.

When the engineering report was received early in March of 1966, the comparative evaluation quite conclusively proved that the move to Schilling was economically desirable. Although year-round maintenance costs at Schilling would obviously be higher because of the more extensive facilities, the city's share of the costs of capital improvements at the old municipal airport would certainly become a sizable burden on the city. Central Airlines had given notice to the city that their planned changeover to turboprop aircraft in 1966 would require additional runway length and this item alone involved considerable moneys for additional land, relocated major roads, and the moving of a high-tension electric power transmission line.

As a result of these preliminary studies, the development council immediately contacted the Federal Aviation Agency and requested that they come to Salina and assist the community in a more detailed study of the possibilities of transferring the municipal airport operation. In the first of a series of meetings with FAA, it was pointed out that the FAA itself would have to evaluate the facilities at Schilling and their adaptability to civilian aircraft operations. The visits by FAA and their meetings with the development council and its successor, the airport authority, continued through July of 1965. On July 28, a formal application was forwarded to FAA by the development council. The application followed the format suggested by FAA and was supported by all of the data required by them. In the initial meetings it had been established that FAA could recommend to the General Services Administration that the supporting utilities and services, such as the water, sewerage, and storm drainage systems, and essential streets could be included, although they need not necessarily be in the airport area itself.

The FAA application was presented in 10 sections titled:

Deficiencies of present municipal airport.

Proposed utilization plan for Schilling runways, taxiways, aprons and related buildings and facilities.

Buildings to be used for airport purposes.

Structures and facilities (other than buildings) to be used for airport purposes.

Buildings and structures encompassed by airport boundaries, not expected to produce revenue and included by virtue of their location.

Utilities and services.

Off-base facilities.

Revenue producing buildings and facilities.

Estimated annual expenditures and expected annual income.

Master development plan for the future.

The application, which included appropriate maps, also included a detailed listing of essential off-base facilities including such items as navigational aids, water wells, water lines and water storage facilities, avigational easements, and similar airfield-associated items of property.

While waiting for FAA to review, approve, and recommend the application to the General Services Administration, the airport authority began preparing for the problems that would be involved in the transfer and which would become the responsibility of the community. Meetings were held with the local aircraft owners and pilots to coordinate the efforts of the authority with them and to keep them well informed. The authority also began the accumulation of a listing of surplus equipment that would be necessary to the airfield operation. This listing was forwarded to the FAA for incorporation in the application for the real property.

Wilson & Co. was engaged to prepare an airport master development plan for submittal to FAA; a requirement at all fields that are a part of the national airport plan.

The council's request that the instrument landing system at Schilling be included in the airport transfer became quite involved. Our request for these items was said to be a precedent and the difficulties of securing the approval of the many agencies involved were most numerous. The problem was not answered by the FAA's inclusion of the ILS system in their recommendation. As was proven in a number of other instances, it took the coordination and effort of the Office of Economic Adjustment to hold the components of the system at the base until the FAA could accept responsibility. The system was a vital concern of the airport authority since without it a number of potential commercial users of the airfield would not be interested in Salina. Similar action was necessary in the case of the control tower and the emergency airfield lighting generator.

When the FAA recommendation was sent to the General Services Administration, it was, for the most part, in conformance with the airport authority's application. FAA saw fit to delete certain areas that had been requested as a part of the airport and these areas, in a few instances, included structures from which the airport authority had expected to receive supporting income. Further, in the case of the cross-wind runway, the FAA deleted one end and its connection to a taxiway. However, the FAA recommendation to GSA did provide a most adequate facility for the establishment of a municipal airport.

The FAA recommendation also proposed that two buildings and the control tower be transferred to them rather than to the airport authority. The FAA flight service station would occupy the former rapcon building, the FAA radio transmitters would be located in a second building, and FAA would become responsible for the control tower.

The airport authority then began an evaluation of the existing hangars at the municipal field and contracted for the dismantling and reerection of two or them at Schilling and for the construction of two new aircraft hangars. The base operations building, which was

in a sense the terminal building at the base, was remodeled and made suitable for a public airport terminal building.

The FAA flight service station will be moved to its new quarters at Schilling in the next few months. The airport authority has agreed to pay the cost of manning the control tower until the record proves that the FAA criteria for establishing and staffing a control tower has been met. It is expected that operations at the new field will quickly reach the minimum of 24,000 itinerant operations per year and that this level will be maintained for three consecutive accounting periods. At that time FAA will assume the costs of the air traffic controllers. This minimum number of flight operations had been reached in two consecutive periods in 1964 at the old airport. New airport users already include Beechcraft, Funk Aviation, and the air branch of the Kansas Highway Patrol.

The city Commission and City Manager Olson are completing plans to convert the old municipal airport into a much needed municipal golf course—the terminal building can be easily converted into an adequate and convenient club house.

The story of the airport package has not been concluded but the future appears to hold promising potentials. There is little question that the facilities at Schilling can be developed into a municipal airport that need not be second to any other municipal field in the country.

APPENDIX C—INDUSTRIAL EXPANSION

When the Salina community began to comprehend the magnitude of the economic blow involved in the closing of the base, its leaders and citizens frantically attempted to organize a concerted effort toward replacing payroll and income that had been provided by the military. Historically, Salina had been an agricultural and trade community. The closing of the base prompted the revitalization of what had been a rather half-hearted campaign to diversify the economic base of the community industrially. Community leaders and the chamber of commerce were in agreement that the greatest single potential for future development would be the utilization of the existing facilities at the base for industrial and commercial purposes. They also quickly inventoried the industrial sites and industrial parks that had been available for some time in other locations within the community.

There appeared to be sufficient land for expansion, but the problem areas seemed to be (1) lack of a coordinated professional approach (2) the need for a trained labor force, and (3) the absence of a data bank which would give prospective industries a clear picture of Salina's assets and liabilities.

The first problem was attacked through coordinated efforts of the city government, the chamber of commerce, and the airport authority.

In the case of the labor force, several significant elements were present:

The median school year completed (persons 25 years or older) was 12.3 in 1960. Thus, there was a basis of educational attainment.

Salina, as an agricultural-trade center, had not developed a reservoir of skilled industrial personnel. Only some 600-900

persons out of the civilian work force (over 18,000) were employed in activities requiring highly developed skills.

The educated younger workers were seeking jobs elsewhere due to limited local opportunities.

Prior to the base closing announcement, it had been recognized that, if industry and manufacturing were attracted to Salina, reduced activities or closure of Schilling would have a lesser and shorter lived effect on the economy of the community.

In the mid-January meetings of 1965 with Washington officials the industrial development committee heard words of wisdom from John Kavanagh and OEA industrial consultant, and others in the delegation. The leaders were told that the first inclination they might have, that a preparing a colorful brochure to be mailed promiscuously around the country, should most certainly be postponed, if not forgotten. They advised, as the recommended alternative, that Salina leaders begin preparing and assembling documentary data about all facets of the community so that it would be available to prospective industrial clients. We were advised of the dangers of committee action, as opposed to the one-man director, because of the "let George do it" attitude that would most certainly develop; that the industrial development effort was not an evening or one weekend's work or something that a citizen might take on as a hobby. The community was admonished that it would probably take 5 years and not 6 months to show any degree of success. In the words of Mr. Kavanagh, a potential industrial client must say no not only once but eight times before he is to be dropped from the effort. The program would take money and our attitudes about spending the money would be most important. Jim Keefe described the development program as involving getting data on people, natural resources, utilities, markets, and in effect, an economic handbook. Within a week after hearing the charges of the industrial development specialists the chamber of commerce was organizing itself to comply with their basic suggestions.

Our community leaders had not, however, fully comprehended the wisdom of the admonition to slow down the advertising of availability of base properties to industry. Potential clients were being shown buildings that could not possibly become available for at least a year and buildings that were not included in the airport package were being shown as available.

The committee soon learned that there was nothing magic about the words industrial development and that it was not a presto chango business. At an early February meeting they reported that there were certainly some sleight-of-hand tricksters abroad. They reported that they had been besieged by persons that would like Salina to put them in business or finance their operations and who obviously considered Salina as an easy mark. Although the committee was investigating each lead or suggestion thoroughly, it was impossible to finance every inventor with an idea. They learned that it was necessary to turn down industries that were obviously not worthy of community consideration.

For the next 2 or 3 months the rumors of industrial client contacts were almost constant. Many of these rumors were actually quite factual and the community was visited by representatives of a number of concerns that had been attracted to Salina. In almost every

instance, the contact was soon lost primarily because of the uncertainties as to occupancy, leasing terms, and other equally important considerations.

Two or three of the early industrial leads did progress to the status of consideration of temporary occupancy permits through established Corps of Engineer's procedures. Prompted by a request from the mayor of Salina, and with the approval of the Air Force and base officials, the Corps of Engineers did advertise the availability of four buildings and solicited bids for occupancy. Only one bid was received on one of the structures and no bids on the others. The single bid proved to be considerably below the expected leasing figure and was rejected.

Early in June 1965, it was announced that the chamber had hired Jim D. Trickett, industrial development specialist from Tulsa, Okla., and that he would start his duties in the first week of July. Within a week after Mr. Trickett's arrival in Salina, the announcement was made that the Westinghouse Corp. was seriously considering the construction of a major lamp plant at Salina. Although the Westinghouse final decision was not made until the 7th of September, it served as a subject for conversation that certainly boosted the morale of the entire community throughout the summer. Mr. Trickett and his industrial development steering committee set their sights on a promised availability date of January 1, 1966, for base facilities and began a continuing search for potential industry.

In these months the airport authority developed standard lease forms, adopted a realistic set of restrictive covenants, made tentative arrangements for the takeover of utility systems and worked out acceptable arrangements with base officials for occupancies by industry.

When the formal approval of the airport package was announced in mid-February 1966 it was possible to announce the successful conclusion of negotiations with seven firms who would totally employ nearly 1,000 persons. To many the success of the industrial development efforts was nothing short of phenomenal.

Beech Aircraft Corp. leased the five largest available buildings including the large maintenance hangar (120,000 square feet) and a modern warehouse (90,000 square feet). Since the first announcement Beech has exercised an option and leased three additional warehouses.

Funk Aviation rented a large hangar and immediately began the production of crop-dusting aircraft.

Customs Metals rented a building and began the manufacture of mobile home components parts.

Craddock Uniforms moved in and are in production of a fine line of band uniforms.

Griswold Seeds opened a distribution center warehouse at the base.

A wholesale frozen food distribution center was opened in another warehouse.

Moisture control equipment was being manufactured, soon in production-line quantities and the production of artificial marble was underway in another structure.

The industrial development chapter of the Salina story is far from ready for conclusion. There are a few possible additions yet pending. Quite unbelievably, the more desirable buildings that became available

with the approval of the airport package have all been leased. The facilities that are still vacant will, in many cases, be suitable only for quite specialized usages. The airport authority is now concentrating on the development of vacant areas within its control. More importantly, the authority is now in the process of negotiating with the General Services Administration for the purchase of those areas deleted from the original application by the FAA. These areas, and the few suitable buildings that are included, were considered to be unnecessary to support the airport under the regulations of the Federal airport disposal procedures and, therefore, fell into the category of properties that would be sold by the General Services Administration.

This story of Salina's industrial expansion would not be complete if mention were not made of the notable efforts of Carl Engstrom, the president of the chamber of commerce, and the cooperation of the chamber under his leadership, during the early days of trial.

As of this hour, Salina's industrial pot is beginning to boil. Hopefully, in a matter of another few short months—perhaps weeks—it could be a rolling boil.

APPENDIX D—THE WAITING WIVES

During the month of March 1965, the 1st Infantry Division of Fort Riley (60 miles from Schilling Air Force Base) was preparing to go to Vietnam. Concurrently, the 735 Capehart units at Schilling were being declared excess to the needs of the Department of Defense.

Departing servicemen at Fort Riley, concerned over the welfare of their families while they were away, approached the Schilling base commander requesting permission for their families to occupy some of the vacant Capeharts. At the same time, at the Washington level, the Army expressed concern over the major social problems brought about by the hurried move of personnel overseas and the consequent loss of Government housing on the part of their families.

These two expressions of serious concern, combined with the DOD/GSA knowledge of the serious glut of residential housing on the civilian economy in Salina, led to a decision to withdraw the Schilling Capeharts from excess status, assign them to the Army, and make them available to families of members of all the military services sent overseas. The Air Force continued to pay the mortgage costs, and to provide essential utility services as long as its caretaker elements were in place at the base. National publicity was given to the program, through both official channels and news media.

The city of Salina has made the "waiting wives" a welcome element of the community. Examples are numerous but one—the fact that the girls at Marymount College babysat for wives attending a special concert at the college—will suffice.

The DOD guidance provided that the Schilling "waiting wives" program would be a test to determine whether such a program was feasible. Currently, the test is scheduled for completion by June 30, 1967.

The program has been an unqualified success, as evidenced by the following statistics: (Data as of August 1, 1966):

520 of the units are currently occupied. Another 152 families are scheduled in.

Total population is some 2,500, including 1,800 children. The Schilling Manor School, located in the Capehart area, will be overcrowded this year (capacity is 900) and it will be necessary to send 300 children to schools in Salina.

The entire operation (excluding the commissary) is being handled with less than 60 full-time personnel.

APPENDIX E—THE RESIDENTIAL HOUSING ISSUE

In 1960, some 6 percent of Salina's dwelling units were vacant (821 out of 14,304). A post office survey on December 4, 1964, showed an increase in vacancies to 1,400—or 9 percent of the inventory at that time. True, there remained a substantial number of below standard dwellings, but the thought of combining an existing high vacancy rate with the loss of some 2,500 Air Force families and the addition of the 735 Air Force-owned Capehart units was a matter of frightening concern.

The first to feel the impact were the Air Force families who had bought homes and were then ordered out—during the period of major drops in market values. The majority of these individuals had purchased homes in the \$9,000 to \$18,000 price range, with the enlisted personnel occupying the lower portion of the price range. A phenomenon known as the "equiteer" arrived on the scene. This individual would approach the Air Force member and offer to relieve him of his mortgage obligations and pay a nominal sum for his equity. The serviceman, concerned about his credit rating, would often jump at the deal. Unfortunately, he was rarely aware of his contingent liability to reassume payment in the event the new buyer failed to meet the mortgage obligations. The equiteer would often rent the house, fail to make any mortgage payments, and pocket the rental proceeds. Then the serviceman, at his new base, having forgotten about his home in Salina, would receive the bill—not only for the current mortgage payment but all those which had been missed.

Many servicemen, who had FHA-insured or VA-guaranteed mortgages, approached these agencies requesting that they be relieved of both the dwelling and the mortgage. FHA, generally, accepted a deed in lieu of foreclosure. VA because of its dependence on a revolving fund, was unable to do so where there was a significant difference in market values and mortgage balances.

All in all, the serviceman homeowner ordered from Schilling in the spring and summer of 1965 had a rough financial time—both in disposing of his home and in avoiding the need for making house payments in two locations, at his new base and back in Salina.

As noted elsewhere, the 735 Capeharts were withdrawn from excess and, as long as they are used for the "waiting wives" program, they will not impact on the residential housing picture of Salina.

With regard to the dwelling units in Salina, another post office survey was conducted on September 16, 1965. At that time, it was estimated that, of 15,588 possible postal deliveries, some 3,321 or 21.3 percent were vacant. Of these 2,578 were residences, 743 were apartments, and 37 were mobile homes.

In order to determine real estate trends since the closing of Schilling, interviews were made with the past president of the Salina Real Estate

Board, reputable real estate firms and local investors. The general consensus was:

1. The value of housing priced at \$15,000 and more has been quite stable since the base was closed.

2. The value of housing priced at less than \$15,000 has experienced a marked drop. The location of housing in this price bracket has had considerable influence on the asking price (for example, the early 1950 emergency housing project in Indian Village lost a major portion of its preclosing announcement value).

3. Older housing in the community experienced the greatest decline in value. One real estate representative commented, "Older houses in the community are a dime a dozen."

All real estate agencies reported excellent business during 1965 and the first 6 months of 1966. Local real estate people believe that this trend is the result of many factors including:

1. There has been considerable movement to better housing-up-grading.

2. Vacant FHA and VA housing, with little or no down payment, has created a new market.

3. Local investors have purchased many properties in anticipation of improved housing markets resulting from the opening of the Westinghouse plant and the new industries which have been attracted or are being attracted to the Salina Airport Industrial Center at former Schilling Air Force Base.

APPENDIX F—ENABLING LEGISLATION

CHAPTER 117—ACQUIRING PROPERTY FROM UNITED STATES

Senate Bill No. 235

AN ACT Authorizing certain cities to establish and create an authority for the purpose of acquiring property from the United States or any of its agencies, the state of Kansas, any political subdivision thereof or any municipality therein, or any other source authorized by this act, and to own, maintain, operate, improve, develop and dispose of such property; and to levy taxes and to issue general obligation bonds, revenue bonds, industrial revenue bonds and warrants to provide revenues required for such purposes.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. This act shall be known as the surplus property and public airport authority act.

SEC. 2. It is hereby declared to be the policy of the state that to promote the public interest, economy, health, safety, education and general welfare of the cities to which the provisions of this act may be applicable and of the residents and property owners therein that the people be empowered to acquire, own, maintain, operate, improve and dispose of surplus real or personal properties of the United States, the state of Kansas, any political subdivision thereof or any municipality therein, within or without the cities to which the provisions of this act may be applicable, including, but not limited to, property which may be essential, suitable or desirable for the development, improvement, operation or maintenance of a public airport. Because of the unique problems which exist relative thereto, the creation of an authority separate and distinct from such cities and the counties in which such cities are located is necessary.

SEC. 3. This act shall apply to any city of the first class located in a county in which the United States Air Force has or shall hereafter acquire, maintain, operate, or control an air base, which air base has been or shall hereafter be declared surplus or is otherwise available for disposition by the United States or any of its agencies.

SEC. 4. As used in this act:

(a) "City" means a city to which this act applies as provided in section 3 of this act which establishes and creates an authority pursuant to this act.

(b) "Authority" means a surplus property and public airport authority created pursuant to this act.

(c) "Property" means any interest in any real or personal property within or without the city acquired or available for acquisition by the authority from:

(1) The United States or any of its agencies pursuant to the federal property and administrative services act of 1949, as amended, the surplus property act of 1944, as amended, the federal airport act of 1946, as amended, and any other federal law relating to disposition of property owned or held by the United States or any of its agencies;

(2) the state of Kansas, any political subdivision thereof, or any municipality therein under the provisions of any applicable statutes of the state of Kansas or municipal ordinances; or

(3) any other source authorized by this act.

(d) "Public airport" means a public airport as defined in the federal airport act of 1946, as amended, and shall include such property which in the determination of the administrator of the federal aviation agency is essential, suitable or desirable for the development, improvement, operation or maintenance of such public airport or reasonably necessary to fulfill the immediate and foreseeable future requirements of such public airport for the development, improvement, operation or maintenance of such public airport, including property needed to develop sources of revenue from non-aviation businesses at such public airport.

(e) "Board of directors" means the board of directors of the authority.

(f) "Director" means a member of the board of directors of the authority.

SEC. 5. The governing body of any city to which this act applies is hereby authorized to establish and create, by adoption of an appropriate ordinance citing this act, and authority as herein provided to acquire, own, maintain, operate, improve, develop, lease and dispose of property in furtherance of the provisions of this act. Such authority shall be a body corporate and politic constituting a public corporation and a tax-supported institution, agency and organization, and shall have the same immunities and exemptions from the payment of costs, damages, charges, taxes and fees as are granted to the city. Such authority shall be managed and controlled by a board of directors consisting of five (5) directors to be appointed by the governing body of the city, each of whom shall be a resident of the city. The original board of directors of the authority shall be appointed at the time of the creation of the authority and one of said directors shall be appointed for a term of three (3) years, two for a term of two (2) years and two for a term of one (1) year, with the term of office of

each such director to commence on the date of his appointment and each of said directors shall serve until the expiration of his term and until his successor is appointed. The governing body of the city shall appoint successors to the original and succeeding directors as the respective term of each expires, each of whom shall serve for a term of three (3) years and until his successor is appointed: *Provided, however,* That no director shall serve as a director for more than eight (8) consecutive years. Vacancies shall be filled for unexpired terms. Any director may be removed by a majority vote of the governing body of the city from office for reasonable cause. The directors shall not be compensated for services rendered as such directors but shall be reimbursed for all reasonable expenses incurred in carrying out their duties as such directors. Notwithstanding the provisions of K.S.A. 13-533 and K.S.A. 13-2111, no person who is appointed as a director, or any corporation in which such director is an officer or stockholder, shall be prohibited by said statute from operating under any franchise granted by the city or having any contract with the city by reason of his appointment as such director: *Provided, however,* That it shall be unlawful for any director to be a party to or pecuniarily interested in, directly or indirectly, any contract, lease, sale of property, franchise or other agreement of the authority.

SEC. 6. The authority shall have perpetual succession subject to the power of the city to dissolve the same in the time and manner provided in section 11 of this act, and shall have the power:

- (a) To adopt, alter and use corporate seal;
- (b) To sue and be sued, to prosecute and to defend any action in any court of competent jurisdiction;
- (c) To receive, purchase, lease, obtain option upon, acquire by contract or grant, or otherwise acquire, to own, hold, maintain, operate, improve, subdivide, lease, lease for oil and gas purposes and develop, and to sell, convey, lease, exchange, transfer, assign, grant option with respect to, mortgage or otherwise dispose of property;
- (d) To enter into contracts to carry out the purposes of the authority and to execute contracts and other instruments necessary or convenient to the exercise of any of the powers of the authority;
- (e) To acquire, hold and dispose of property without regard to the provisions of any other laws governing the acquisition, holding and disposition of public property and public funds by cities and their agencies;
- (f) To adopt, amend and repeal bylaws, rules and regulations not inconsistent with this act governing the manner in which the powers and purposes of the authority shall be carried out and effected: *Provided, however,* The same shall become effective upon ratification of the governing body of the city;
- (g) To select, appoint, employ, discharge or remove such officers, agents, counsel and employees as may be required to carry out and effect the powers and purposes of the authority and to determine their qualifications, duties and compensation;
- (h) To borrow money and pledge, mortgage or otherwise hypothecate property and revenues as security therefor;
- (i) To contract with the United States or any of its agencies, the state of Kansas, any political subdivision thereof and any municipality therein with respect to the terms on which the authority may agree to purchase or receive property, including, but not limited to,

provisions for the purchase of property over a period of years, for payment of the purchase price or installments thereof in the manner and to the extent required, and for pledge of all revenues and income received from the sale or operation of said property after providing for administration, maintenance and operation costs, to payment of the principal of the purchase price and interest thereon or of any bond issued by the authority therefor;

(j) To enter into agreements with the city or others for the furnishing of any utilities, facilities and services owned, maintained, furnished or conducted by the city on such terms and conditions and for such considerations as may be agreed upon between the city or others and the authority;

(k) To distribute to the city any funds not necessary for the proper conduct of the affairs of the authority.

SEC. 7. This act shall empower any city to which this act applies to establish and create an authority, and shall empower such city and such authority to exercise the powers herein granted, and no action, proceeding or election, other than the adoption of the ordinance referred to in section 5 of this act, shall be required prior to the establishment and creation of such authority or to authorize the exercise of any of the powers herein granted, any provisions of the laws of the state or of any city charter or ordinances to the contrary notwithstanding. The boundaries of any such authority shall be commensurate with the boundaries of the property acquired by the authority and the property so acquired need not be in a single contiguous area. All or any part of the real estate constituting a part of the property located within the boundaries of the authority may be annexed and taken within the corporate limits of the city in the same manner and to the same extent as any other real estate which is not owned or controlled by the city and any such real estate so annexed and taken within the corporate limits of the city shall be exempt from any bond indebtedness of the city incurred prior to the date of such annexation, and the city may exempt such real estate from any city taxes which the governing body of the city shall determine. A city which establishes and creates an authority under the provisions of this act and the authority created by such city shall have the same rights, privileges and immunities with respect to property located outside the municipal limits of such city as now exist for any property located within the limits of such municipality, including the right of eminent domain: *Provided*, That the right of eminent domain shall be exercised only by the authority with the approval of the governing body of the city in order to acquire property or an interest in or through air space which is essential, suitable or desirable for the development, improvement, operation or maintenance of a public airport. Such city shall also have the right to transfer and convey to such authority, without consideration, any public airport owned by such city.

SEC. 8. With the consent of the governing body of the city, the authority may annually levy a tax not to exceed three (3) mills on each dollar of the assessed tangible valuation of the property of the city for the furtherance of the purposes of the authority, to be levied and collected in like manner with other taxes, which levy the board of directors shall, on or before August 25, of each year, certify to the county clerk who is hereby authorized and required to place the

same on the tax roll of said county to be collected by the treasurer of said county and paid over by him to the board of directors of the authority. Such levy shall be in addition to all other levies authorized by law and none of the limitations of chapter 79, article 19, of the Kansas Statutes Annotated, shall apply to such levy. The authority shall be exempt from the provisions of the budget laws of the state.

SEC. 9. The authority shall have power to issue its own general obligation bonds, revenue bonds, industrial revenue bonds, and no-fund warrants as hereinafter in this section provided.

(a) If the authority shall desire to issue its general obligation bonds, the board of directors of the authority shall adopt a resolution setting forth the principal amount of bonds proposed to be issued and the purpose for which said bonds are to be issued, and shall forward a certified copy of such resolution to the mayor of the city. The mayor shall present such resolution to the governing body of the city for its approval or disapproval. If the governing body of the city shall by ordinance disapprove said resolution of the authority, no further action shall be taken by the authority on the basis of said resolution. If the governing body of the city shall by ordinance unconditionally approve said resolution of the authority, the governing body of the authority may proceed to authorize and issue the general obligation bonds of the authority in the amount and for the purpose specified in the resolution of the authority. The governing body of the city, however, upon the presentation to it of the resolution of the authority, in lieu of disapproving or unconditionally approving said resolution, may adopt a resolution giving its approval of the resolution of the authority but directing the publication once in the official city newspaper of a notice setting forth the intention of the authority to issue its general obligation bonds in the amount and for the purpose specified in the resolution of the authority, and if within fifteen (15) days after the publication of said notice there shall be filed with the city clerk a written protest against the issuance of said general obligation bonds of the authority signed by not less than twenty percent (20%) of the qualified electors of such city, the governing body of the city shall submit the proposed improvement and the proposed general obligation bond issue of the authority to the electors of the city at a special election to be called for that purpose upon at least ten (10) days' notice, to be held not later than sixty (60) days after the filing of such protest, or at a regular city election or general election which will occur not sooner than thirty (30) days nor later than sixty (60) days after the filing of such protest. In the event that a majority of the voters voting on such proposition at such election shall vote in favor thereof, such improvement may be made and such general obligation bonds of the authority may be issued by the authority to pay the cost thereof. General obligation bonds of the authority shall not be issued in excess of three percent (3%) of the assessed valuation of all the tangible taxable property within the city as shown by the assessment books of the previous year. The general obligation bonds of the authority as to the term, maximum interest rate, and other details shall conform to the provisions of the general bond law. The full faith and credit of the authority shall be pledged to the payment of the general obligation bonds of the authority, including

principal and interest, and the authority shall annually levy a tax on all tangible taxable property within the city, in addition to all other levies authorized by law, in an amount sufficient to pay the interest on and principal of said bonds as the same become due. Such general obligation bonds of the authority shall not constitute a debt or obligation of the city which established and created the authority.

(b) The authority may issue from time to time the revenue bonds of the authority for the purpose of purchasing, constructing, or otherwise acquiring, repairing, extending, or improving any property or facility of the authority and may pledge to the payment of such revenue bonds, both principal and interest, any rental, rates, fees or charges derived or to be derived by the authority from property or facilities owned or operated by it. Such revenue bonds of the authority shall mature serially beginning not later than five (5) years after the date of issuance, and the date of maturity of such bonds shall not be fixed for a longer period of time than thirty-five (35) years after the date of issuance. Said revenue bonds shall bear interest at a rate not exceeding five percent (5%) per annum, payable semiannually, such interest to be evidenced by coupons attached to said bonds. Such bonds and interest coupons shall be negotiable. Said bonds shall contain recitals stating the authority under which such bonds are issued, that they are issued in conformity with the provisions, restrictions and limitations of such authority, and that such bonds and interest coupons are to be paid by the issuing authority from any rental, rates, fees or charges derived or to be derived by the authority from property or facilities owned or operated by it and not from any other fund or source. The resolution authorizing the issuance of revenue bonds of the authority may establish limitations upon the issuance of additional revenue bonds of the authority and may provide that additional revenue bonds shall stand on a parity as to the revenues of the authority and in all other respects with revenue bonds previously issued by the authority on such conditions as may be specified in the resolution. Said resolution may include other agreements, covenants or restrictions deemed advisable by the governing body of the authority to effect the efficient operation of the property and facilities of the authority, and to safeguard the interests of the holders of the revenue bonds of the authority, and to secure the payment of said bonds and the interest thereon promptly when due. When an authority authorizes and issues its revenue bonds under the provisions of this section, an amount of the net revenues of the property and facilities of the authority sufficient for the purpose shall be pledged to the payment of the principal of and the interest on the bonds as the same become due, and it shall be the mandatory duty of any authority issuing revenue bonds under this act to fix and maintain rentals, rates, fees and charges for the use and services of the property and facilities of the authority sufficient to pay the cost of operation and maintenance of such property and facilities, pay the principal of and interest on all revenue bonds or other obligations issued by the authority and chargeable to the revenues of the authority as and when the same become due, provide an adequate depreciation and replacement fund, and create reasonable reserves therefor, and to provide funds ample to meet all valid and reasonable requirements of the resolution authorizing the

revenue bonds. Said bonds shall be registered in the office of the secretary or clerk of the authority issuing the same and in the office of the state auditor and shall not be offered for sale to the state school fund commission.

(c) The authority may issue the industrial revenue bonds of the authority, such bonds to be issued in the manner and under and in accordance with the terms and provisions of K.S.A. 12-1740 to 12-1749, inclusive, and any acts relating to the subjects of such act, and all amendments thereof.

(d) The authority may issue its no-fund warrants under the conditions and in the manner provided by law for the issuance of no-fund warrants by cities of the first class.

(e) The bonds, warrants, and other obligations and liabilities of the authority shall not constitute any debt or liability of the state of Kansas or of the city which established and created the authority, and neither the state nor the city shall be liable thereon.

SEC. 10. All contracts, leases, agreements, books and records of the authority shall constitute public books and records and shall be available for examination by the city and any of its officers, employees and agents during normal business hours. The authority shall cause an audit of its books and records to be conducted at least annually, by an independent certified public accountant and the city shall be furnished copies of the report of such examination.

SEC. 11. An authority created and established by a city may be dissolved at any time by such city by adoption of an appropriate ordinance effecting a dissolution thereof: *Provided, however,* That the authority established hereunder shall continue for a period of not less than ten (10) years: *Provided further, however,* That an authority established hereunder shall not be dissolved until all of its liabilities, bonds and other valid indebtedness have been paid in full or have been otherwise discharged: *Provided further, however,* That upon such dissolution the city shall acquire the property of the authority subject to any leases or agreements duly and validly made by the authority.

SEC. 12. If any section, clause or provision of this act shall be declared unconstitutional, the decision shall affect only the section, clause or provision so declared to be unconstitutional and shall not affect any other section, clause or provision of this act.

SEC. 13. This act shall take effect and be in force from and after its publication in the official state paper.

Approved April 9, 1965.

Published in the official state paper April 16, 1965.

CHAPTER 422—ESTABLISHMENT OF SCHILLING INSTITUTE

House Bill No. 1101

AN ACT Providing for the establishment of Schilling institute under the state education authority therein created; providing certain powers and duties.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. This act shall be known and may be cited as the "state education authority act."

SEC. 2. As used in this act unless the context otherwise requires:

(a) The term "state authority" means the state education authority established by this act.

(b) The word "president" means the chief administrative officer of Schilling Institute.

(c) The term "state education authority division" means the sub-department of the department of public instruction which is headed by the state education authority.

(d) The term "technical education" means vocational or technical training or retraining which is given in or by Schilling institute and which is conducted as a program of education designed to train individuals as technicians in recognized fields. Programs of technical education include, but not by way of limitation, aeronautical technology, construction technology, drafting and design technology, electrical technology, electronic technology, mechanical technology, automatic data processing and computer technology, industrial technology, metals technology, safety technology, tool design technology, cost control technology, surveyor, industrial production technology, sales service technology, industrial writing technology, communications technology, chemical control technology, or quality control technology. Additional programs of technical education shall be specified from time to time by the state educational authority in the manner provided in this act.

(e) The term "state technical plan" means the plan formulated by the state authority in compliance with this act and shall consist of such provisions concerning the establishment and operation of Schilling institute as may be necessary or appropriate to plan and guide Schilling institute and programs offered thereby.

(f) The term "advisory council" means the eleven-member advisory council provided for in subsection (h) of section 2 of House bill No. 893 of the 1965 regular session of the legislature, being the community junior college act, and such advisory council is hereby given the additional name of technical education advisory council.

(g) The term "state superintendent" means the state superintendent of public instruction.

SEC. 3. There is hereby created the state educational authority which shall be composed of three (3) members as follows:

(a) The state superintendent of public instruction shall be a member and chairman of the state authority for a term concurrent with his term as state superintendent.

(b) The governor shall appoint the other two (2) members of the authority for terms of four years each to commence on May 1, 1965. Any vacancy occurring under (a) shall be filled by the person who succeeds to the office of state superintendent of public instruction, and may be the assistant state superintendent of public instruction. Any vacancy occurring under (b) shall be filled by appointment for the unexpired term, if any, and otherwise for a term of four (4) years by appointment of the governor. Incumbent members of the state authority shall continue to hold over after completion of their terms until a successor is duly appointed and qualified. Members other than the chairman may be removed for cause by ouster by the state on the relation of the attorney general. Members of the state authority shall be paid travel and subsistence expenses incurred in performance of their duties. The authority shall have such powers and perform such duties as are prescribed in this act, and such other powers and duties as may be provided by law.

SEC. 4. The state educational authority is hereby designated to be the state board charged with planning, establishment, development and control of Schilling institute. The state authority is empowered and directed to establish, create and equip at Salina, an institution for technical education to be known and called Schilling Institute. The state authority shall appoint the president of Schilling Institute who shall serve at the pleasure of the state authority and who shall receive such compensation as is provided by the state authority and approved by the state finance council. The state authority is authorized to employ such other persons for professional or other work as it deems proper upon such terms as it may determine.

SEC. 5. The president shall appoint professors, teachers and teaching technicians of Schilling institute and shall fix their compensation with the approval of the state authority. The number and qualifications thereof shall be determined by the state authority but shall not be inconsistent with provisions of the state technical plan. The president shall appoint such administrative officers and employees as are necessary to the operation of Schilling institute and their compensation and tenure (not including the president, professors or teachers), shall be fixed in accordance with the Kansas civil service act. The president, professors, technicians and teachers of Schilling institute shall be included for retirement purposes within any retirement plan or system which may be provided by K.S.A. 74-4925. All administrative officers and employees not engaged by Schilling institute to give instruction shall be covered for retirement purposes under the Kansas public employees retirement system created under K.S.A. 74-4901 to 74-4924, both inclusive.

SEC. 6. The state authority shall prepare and adopt the state technical plan in accordance with the provisions of this act and the following shall apply to the state technical plan and its adoption:

(a) Any part or parts of the state technical plan may be adopted by the state authority at any regular or special meeting.

(b) Any part or parts of the state plan provided for in the community junior college act may be adopted by reference as a part of the state technical plan.

(c) Any part or parts of any state plan for vocational education may be adopted by reference as a part of the state technical plan.

(d) The state plan may include any provisions that the state authority deems appropriate for the control or planning of Schilling institute or technical education.

(e) Any part or parts of any rules and regulations of the state authority or any other rules and regulations may be adopted by reference as a part of the state technical plan.

(f) Any part or parts of any state plan adopted by the state higher education facilities commission established under Senate bill No. 1 of the 1965 regular session of the legislature may be adopted by reference as a part of the state technical plan.

(g) Schilling institute may be planned for and developed to qualify as a "public technical institute" as such term as defined in subsection (g) of section 751 of Title 20 of the United States Code, or as an "area vocational education school" as that term is defined in subsection 2 of section 35g of Title 20 of the United States Code or as both such public technical institute and such area vocational education school.

(h) The state authority or any person designated by it may prepare a part or all of a state plan related to Schilling institute to be submitted to the state higher education facilities commission to be submitted by such state commission under authority of Senate bill No. 1 of the 1965 regular session of the legislature to the proper authorities of the federal government under the higher education facilities act. The state higher education facilities commission shall give any such plan or part of a plan so submitted a high priority in its recommendations and state plans.

(i) The state authority or any person designated by it may prepare a part or all of a state plan related to Schilling institute to be submitted to the state board for vocational education, and the same shall be given high priority for inclusion in the state plan for vocational education.

SEC. 7. The state authority shall have and may exercise the following powers and authority:

- (a) To prepare and adopt the state technical plan;
- (b) to exercise and perform any powers granted in this act;
- (c) to adopt rules and regulations in the manner provided by law;
- (d) to grant certificates of completion of courses or curriculum and to grant associate of arts degrees;
- (e) to provide either through rules and regulations or through the state technical plan for eligibility for school activities, tuition, fees, courses and curriculum of any student of Schilling institute;
- (f) to contract with the governing body of any subdivision of the state of Kansas to carry out the purpose and intent of this act; the governing body of every subdivision of government in Kansas is authorized to contract with the state authority for such purposes;
- (g) to accept from the United States government or any of its agencies or any other public or private body grants or contributions of money, funds or property which the authority may authorize to be used for or in aid of Schilling institute or any of the purposes authorized by this act or the state technical plan;
- (h) to acquire by gift, purchase, condemnation or otherwise, own, lease, use and operate property, whether real, personal, or mixed, or any interest therein, which is necessary or desirable for technical education;
- (i) to determine that any property owned by Schilling institute or the state authority is no longer necessary for technical education purposes and to dispose of the same at public or private sale.
- (j) to exercise the right of eminent domain, pursuant to chapter 26 of the Kansas Statutes Annotated;
- (k) to acquire any land and buildings formerly comprising any part of what is commonly known as Schilling air force base, Salina, Kansas, by purchase, lease or contract from the United States government or any of its agencies. The state authority is authorized to grant such assurances as may be appropriate to the acquisition and utilization of any such land and buildings;

(l) the state authority, or the president to the extent authorized by the state authority, may purchase, equip and construct such buildings and installations as may be necessary or appropriate to carry out the purposes of this act.

SEC. 8. Funds appropriated by the legislature for the state authority or Schilling institute shall be appropriated to the state authority as a division of the state department of public instruction: *Provided*, Appropriations of the state board vocational education either of the current fiscal year or any following fiscal year for area vocational-technical schools or education may be allocated to the state authority for the purposes specified in this act. Any funds appropriated by the legislature may be used by the state authority in any manner not in conflict with the appropriation act. Expenditures made for Schilling institute shall be made by the state authority, or by the president in accordance with provisions and procedures specified by the state authority. The budget of the state authority shall be a part of the budget of the department of public instruction. The budget of the state authority shall include the budget for Schilling institute. The state superintendent in preparing the budget of the state department of education shall include the budget of the state authority. Preparation of that part of the budget of the state department of public instruction related to the state authority shall be subject to approval and adoption by the state authority. Budget hearings on the budget of the state department of public instruction, and in particular on the part thereof relating to the state authority, shall be had and conducted as may be prescribed by the budget director on advice of the governor.

SEC. 9. The state controller is authorized to issue his warrants on the vouchers of the state authority for any funds appropriated to the state authority or Schilling institute. The state controller may also issue his warrants on the vouchers of the president to the extent and upon such limitations as may be prescribed by the state authority.

SEC. 10. If any clause, paragraph, subsection or section of this act shall be held invalid or unconstitutional it shall be conclusively presumed that the legislature would have enacted the remainder of this act without such invalid or unconstitutional clause, paragraph, subsection or section.

SEC. 11. This act shall take effect and be in force from and after its publication in the official state paper.

Approved April 26, 1965.

Published in the official state paper May 13, 1965.

APPENDIX G—STATISTICAL DATA

Economic indicator data is of importance in appraisal of the impact upon the Salina community caused by the closure of Schilling Air Force Base. Summerized data for a few of these indicators has been selected as documentation for the Salina story.

Civilian workforce trends, Salina, Kans., area (Saline County)

Industry	May 1963	May 1964	May 1965	May 1966
Civilian workforce, total.....	18,850	19,400	17,400	16,050
Unemployed.....	525	450	425	300
Percent of civilian workforce.....	2.8	2.3	2.4	1.9
Employed, total.....	18,325	18,950	16,975	15,750
Agricultural.....	1,000	1,000	950	875
Nonagricultural.....	17,325	17,950	16,025	14,875
All other.....	2,450	2,575	2,250	1,925
Wage and salary.....	14,875	15,375	13,775	12,950
Manufacturing.....	1,475	1,775	1,450	1,400
Food and kindred products.....	850	825	800	625
Other manufacturing.....	625	950	650	775
Nonmanufacturing.....	13,400	13,600	12,325	11,550
Contract construction.....	2,050	1,900	1,525	1,350
Transportation, communication, electricity, gas, sanitation service.....	1,425	1,475	1,325	1,325
Wholesale and retail trade.....	4,275	4,475	4,050	3,850
Finance, insurance and real estate.....	625	625	625	600
Services.....	2,850	2,850	2,975	2,900
Government.....	2,125	2,225	1,775	1,475
Other.....	50	50	50	50

Source: "The Salina Labor Market Review" published by the Salina office of the Kansas Employment Service.

Bank debits to demand deposit accounts of individuals, partnerships, and corporations, Salina, Kans.

[In thousands of dollars]

Year	Amount	Year	Amount
1960.....	\$716,449	1963.....	\$916,514
1961.....	806,256	1964.....	882,677
1962.....	871,259	1965 ¹	842,099

¹ 1965, 1st 5 months, \$335,086; 1966, 1st 5 months, \$370,784 (10.7-percent increase over same period of 1965).

Source: Federal Reserve Bank, Kansas City, 10th district.

BUSINESS DATA: RETAIL TRADE AND SERVICE ESTABLISHMENTS

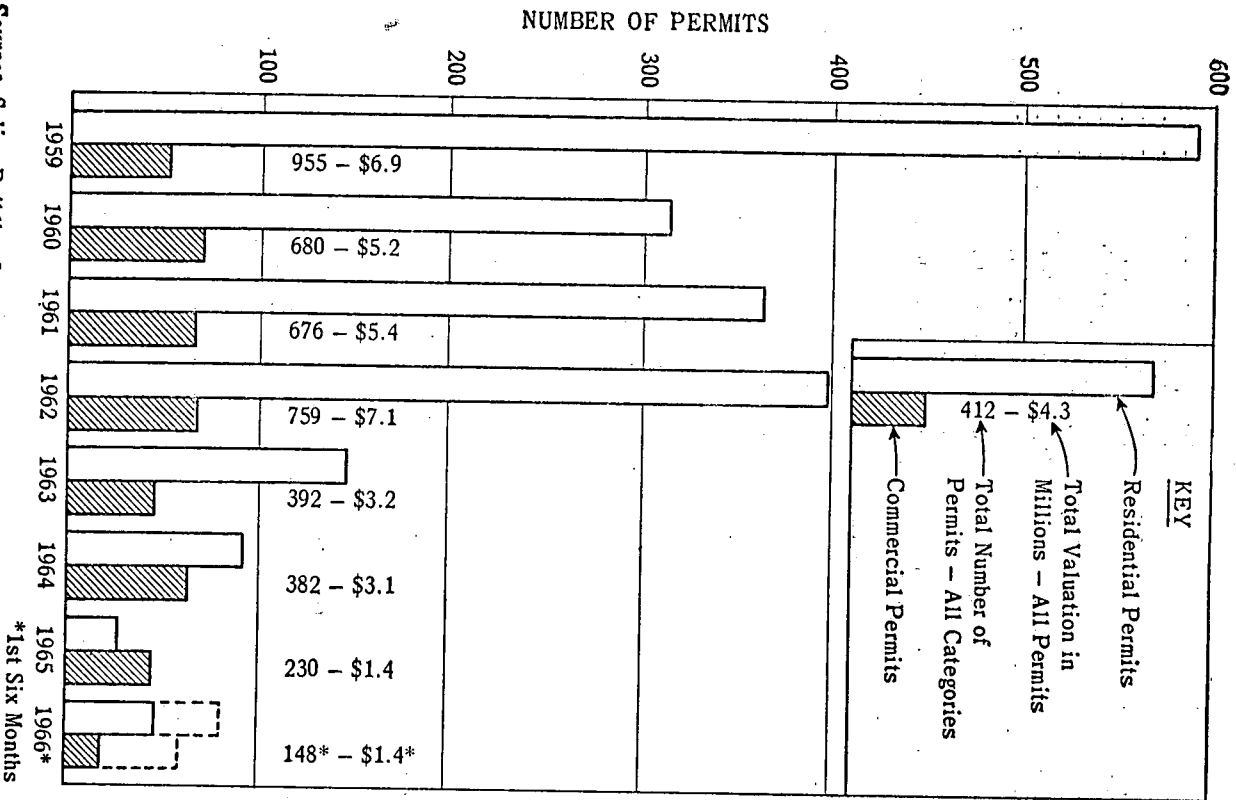
The Salina Credit Bureau reports that the number of business establishments in the city decreased following the closing of Schilling Air Force Base. They point out that the trend took an upward turn in March and April of 1966.

Four major retail business establishments closed and one major retail business reduced its floor area after the base closure: three department stores, one lumber yard, and a hardware store.

The credit bureau estimated that about 20 service-type businesses closed during the period. These businesses included: beauty shops, military store, restaurants, shoe stores, ready-to-wear shops, small sundry shops, lending institutions, jewelry stores, taverns, grocery stores, and service stations. In their opinion the marginal service businesses that have weathered the storm will prosper as new growth is experienced in the community.

It should be pointed out that business trends are not all negative. The building permit records show that twenty-one new business buildings were built in the city of Salina during 1965 and the first 6 months of 1966. In addition, two major chainstore operations more than doubled their floor space for retail activities.

BUILDING CONSTRUCTION PERMITS
SALINA, KANSAS



Source: Salina Building Inspection Office

Total retail sales, Saline County

[Estimated percentage change from same month of previous year]

Month	Percentage change	Month	Percentage change
October 1964	-3.3	July 1965	-6.2
November 1964	-1.9	August 1965	-10.2
December 1964	-17.4	September 1965	-8.2
January 1965	+1.5	October 1965	-14.8
March 1965	+1.7	November 1965	-7.7
April 1965	-2.4	December 1965	+10.8
May 1965	-13.1	January 1966	+12.8
June 1965	-2.3	February 1966	+5.8

Source: Kansas Business Review, published by the Center of Regional Studies, University of Kansas.

Retail sales tax collections and tax rate, Saline County

Year ended June 30	Retail sales tax collections	Tax rate (percent)	Year ended June 30	Retail sales tax collections	Tax rate (percent)
1950	\$603,868.04	2	1959	1,706,223.55	2½
1951	718,069.73	2	1960	1,811,328.54	2½
1952	876,190.83	2	1961	1,952,245.23	2½
1953	1,038,342.85	2	1962	2,107,176.85	2½
1954	1,032,224.99	2	1963	2,050,038.16	2½
1955	1,161,324.98	2	1964	2,127,629.72	2½
1956	1,148,119.49	2	1965	2,074,934.51	2½
1957	1,122,930.99	2	1966 (estimated)	1,850,000.00	2½
1958	1,125,849.62	2			

Source: State of Kansas, Department of Revenue.

September school enrollment by divisions

	1957	1958	1959	1960	1961	1962	1963	1964	1965 ¹	1966 ¹
Special									55	63
Kindergarten	889	987	1,102	1,146	1,236	1,313	1,211	1,261	1,215	825
Elementary	4,021	4,419	4,486	4,619	5,121	5,147	5,271	5,582	5,341	3,964
Junior High	1,437	1,554	1,751	1,944	2,133	1,991	1,933	2,029	1,975	1,770
Senior High	1,035	1,202	1,337	1,332	1,463	1,625	1,745	1,840	1,720	1,501
Total	7,382	8,162	8,676	9,041	9,953	10,076	10,160	10,712	10,306	8,123

¹ January data.

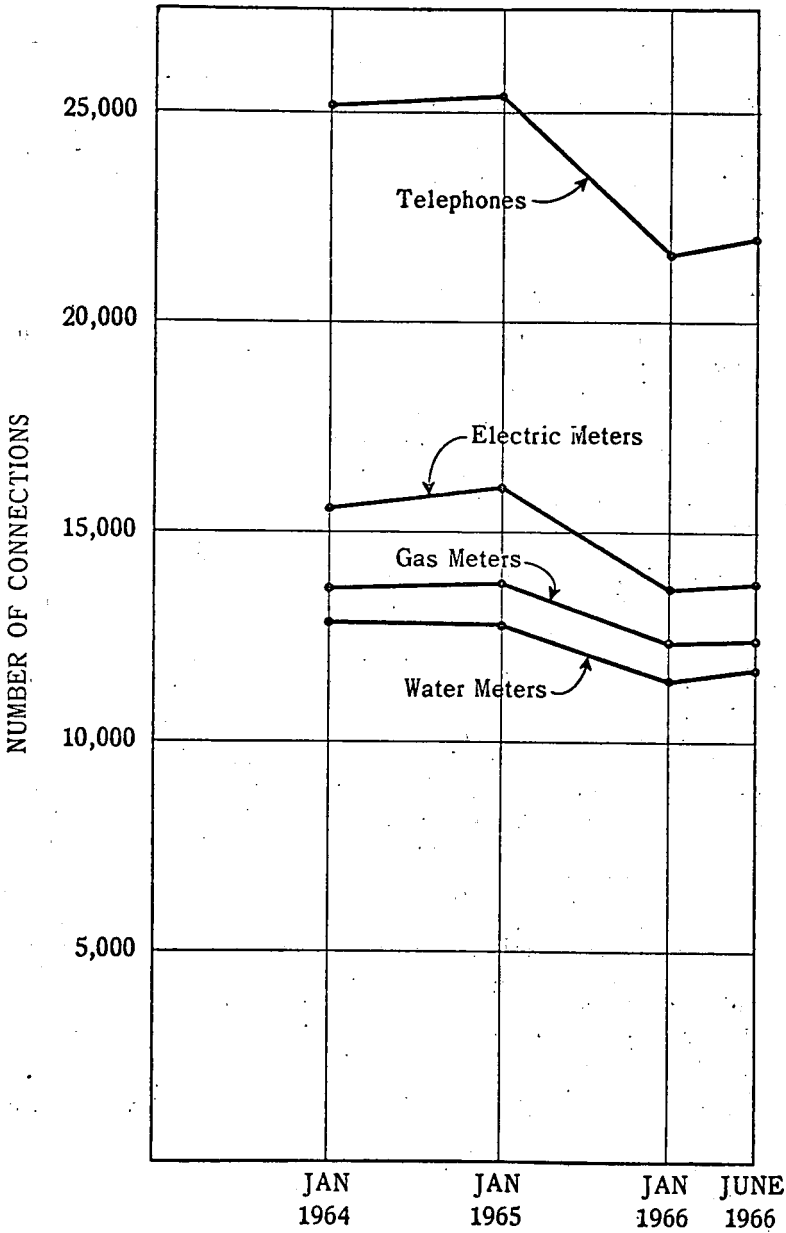
Source: Salina Superintendent of Schools.

School enrollment trends, January 1963 to March 1966

Date of report	Primary school enrollment	Secondary school enrollment	Total	Pupils leaving school	
				Number	Moved away
Jan. 18, 1963	6,398	3,499	9,897	396	373
Mar. 22, 1963	6,244	3,433	9,677	482	437
Oct. 30, 1963	6,535	3,651	10,186	282	244
Jan. 17, 1964	6,639	3,620	10,259	403	303
Mar. 20, 1964	6,770	3,631	10,301	315	276
Nov. 4, 1964	6,727	3,772	10,499	415	374
Jan. 22, 1965	6,611	3,695	10,306	425	382
Jan. 21, 1966	4,852	3,271	8,123	398	370
Mar. 25, 1966	4,916	3,293	8,209	224	200

Source: Salina Superintendent of Schools.

UTILITY CONNECTION TRENDS
SALINA, KANSAS



ECONOMIC IMPACT ANALYSIS OF SUBCONTRACTING PROCUREMENT PATTERNS OF MAJOR DEFENSE CON- TRACTORS: SEPTEMBER 1966*

[Submitted to Deputy Assistant Secretary of Defense, Systems Analysis—(Economics) (Contract DA-49-083 OSA 3116) Task Order SA-7]

I. SUMMARY OF FINDINGS

The following findings and conclusions (necessarily tentative because of the inherent data limitations described in ch. II) may prove useful both for what they reveal quantitatively as well as for the directions they suggest for further study:

1. A comparison of the geographic place (State) of performance distribution of C-E-I-R study subcontracts with DOD prime contracts shows that eight of the top 10 States appear on both lists, though there are noticeable differences in some of these State shares of the National totals. California and New York, which rank first and second in both series, together account for over 40 percent of the U.S. total subcontract awards. (See table 5, cols. 1 and 2.)

2. Geographic concentration appears to be greater for subcontract than for DOD prime contract awards. The 10 leading States in the subcontract series receive over 75 percent of all subcontract awards, whereas the 10 top States in the prime contract series account for 67 percent of total DOD prime contract procurement. (See table 5, cols. 1 and 2.)

3. Comparison of the subcontract geographic distribution for this study with that of the census MA-175 survey of defense-oriented industries for 1963, reveals surprisingly similar patterns. The five top ranked States are not only identical in order of rank, but are virtually equal in their share of the national totals individually and collectively. (See table 5, cols. 1 and 3.)

4. When comparing the C-E-I-R study with the NASA subcontract place of performance patterns, the two top States hold identical rank positions in both series. However, there are sizable variations in their share of the national total as well as in the order of ranking of the other leading states. (See table 5, cols. 1 and 4.)

5. Prime contractors located in California, New York, and Missouri were the originating source of 70 percent of all subcontract awards covered in this study. (See table 7, col. 2.)

6. The three leading States of origin (California, New York, and Missouri) are identical in rank for both the C-E-I-R study and NASA subcontract award series. These States originate approximately 70 percent of all subcontract procurement covered by both of the series. (See table 8.)

*Preliminary report by C-E-I-R, Inc., Applied Research and Management Sciences Division, Bethesda, Md.

7. An analysis of interstate and interregional subcontracting flows reveals that—

(a) Though the two leading subcontract performing States, California and New York, were net exporters of subcontracts (awarded a greater value of subcontracts than they received), they far outranked other States in value of subcontracts performed within the State. (See table 9A, col. 5.) This results from their retention of a high proportion of the sizable total dollar value of subcontracts awarded by their indigenous prime contractors. Among the leading States in DOD prime contracts received, California retains for within-State subcontract performance almost 53 percent of all subcontracts awarded by its prime contractors, New York retains 29 percent, and Missouri only 2 percent. (See table 10, col. 1.)

(b) On the average, only one-third of the subcontract procurement by prime contractors in a State are awarded to subcontractors within the same State. The retention ratios within the broader census division and region increase to 40 and 49 percent, respectively. (Table 10.)

(c) The general net flow of subcontracts tends towards the States in the northeast and north central regions. States in the west and south regions, except for Maryland and Virginia, received a substantially higher proportion of their subcontract performance from within-State prime contractors than from primes located in other States. (Table 10.)

(d) There appears to be little discernible relationship between the relative share a State receives in subcontracts and its distance from the prime contractor's State of origin. A special check of California and New York prime contractors showed that there were considerable variations in the proportion of subcontracts awarded within their particular State and region, and also their comparative awards to the other regions. Indicative of the peculiarities of distribution, subcontracting firms in California received a greater share of New York's awards than subcontractors within New York. New York, on the other hand, received only a small proportion of all California defense subcontract awards. As factors other than distance appear to be more significant in determining the selection of a subcontractor, these merit more study than data available for this study permitted. (See app. IV.)

8. A study of subcontracting concentration reveals that for all prime contractors (submitting usable data on value of awards to individual subcontractors) their top 10 subcontractors account for an average of over 80 percent of all subcontracts awarded. Considerably below this average are the prime contractors in the aircraft and airframe claimant program whose top 10 subcontractors accounted for only 50 percent. (See table 13.)

9. A sample of four large prime contractors indicates that 70 to 90 percent of their total subcontracting dollar value is concentrated in relatively few (no more than 10) SIC 4-digit industries. (See table 14.)

NEW ENGLAND'S DEFENSE CLOSINGS*

PART I: IMPACT ON AFFECTED COMMUNITIES

Announcement of the closing of several large defense installations in New England presents a challenge to many affected communities. The Defense Department made public its decision to close these bases several years in advance in order to allow the communities sufficient time to attract new industries. In some places, however, much time and effort were devoted to reversing the decision and "saving the installation." Now that the closings have been accepted, positive plans for the future are being made.

In this article, the varying impact of defense installation closings will be assessed. To help affected communities select useful industrial techniques, a description of some positive steps taken is also included. In general, during periods of full employment most affected communities can make the transition with relatively few problems.

GOVERNMENT AID

When the Defense Department finds it necessary to close a particular installation, a special program is used to cushion the impact for the workers and the affected community. This adjustment program is two-pronged. First, job opportunities are being offered to permanent civil service employees who are willing to be moved to another job in the Department of Defense. Second, a special community assistance program has been set up to help attract new industry to areas where the Defense Department has closed down. The Office of Economic Adjustment within the Department of Defense provides technical know-how to affected communities and particularly helps to locate and expedite Federal aid programs. Because the majority of workers are guaranteed other jobs within the government, the problems of the affected communities differ substantially from those of the displaced workers. Part I of this article deals with the community impact and Part II with impact on the workers.

Most of New England's affected installations played an important role in the country's early history. Capt. John Paul Jones' ship, the *Ranger*, of Revolutionary War fame was built at Portsmouth before it had an official naval shipyard. The Springfield Armory was the first to be established by the U.S. Government and dates back to 1794. There Eli Whitney developed machinery for standard interchangeable gun parts. The Watertown Arsenal, established in 1815, soon became particularly noted for its special metals and castings for cannon. Now, however, vast changes in technology have caused the Defense Department to consider their continued operation uneconomic.

Although the region has not been particularly hard hit by the closing

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of defense bases primarily employing military personnel, its loss in government manufacturing jobs in shipyards, arsenals, and armories has been severe since 1961. As shown in table 1, these job losses were proportionally about three times greater than in any other region.

TABLE 1.—*Personnel affected by actions to close or reduce major military installations, 1961-65*¹

[Census region and type of activity]

Region	Manufacturing installations				Bases and other installations			
	Number of actions	Number of personnel	Number affected per 1,000 employment	Rank	Number of actions	Number of personnel	Number affected per 1,000 employment	Rank
New England.....	3	12,200	3.17	1	3	6,600	1.35	8
Middle Atlantic.....	3	13,350	1.08	2	12	26,850	2.18	6
Pacific.....	3	4,950	.68	3	16	26,235	3.60	4
South Atlantic.....	1	1,000	.12	4	4	14,400	1.78	7
East North Central.....	1	900	.07	5	7	10,950	.90	9
West North Central.....	0				13	31,450	6.69	1
Mountain.....	0				9	13,340	6.35	2
East South Central.....	0				2	17,100	5.57	3
West South Central.....	0				8	15,550	3.51	5

¹ Information on actions is from U.S. Department of Defense news releases and a memorandum dated July 20, 1965. A major closing is one which affects 350 or more personnel. Employment figures used in the calculations are total nonagricultural employment, 1964, U.S. Bureau of Labor Statistics.

VARYING IMPACTS

The closings affect three States of the region in varying degrees ranging from 2.6 jobs for each 1,000 nonagricultural employees in Massachusetts to 32 jobs for each 1,000 in Maine.

The severity of the impact depends in part on the type of installation to be closed. The shutting of a military base probably has the least impact. Military bases are typically quite self-sufficient with on-base housing and post-exchange facilities limiting the amount of money spent in the local community. In contrast, a government-owned manufacturing facility such as an arsenal or a Navy yard employs many civilians who live in the local area and trade at local stores. Thus, it contributes substantially more to a community's economic base than a typical military installation.

The impact of a defense base closing is also influenced by the reuse potential of the land and buildings vacated by the Department of Defense. An Air Force base requires an extensive amount of land relative to the employment it provides. In contrast, a Navy yard uses only a small land area to generate substantial employment. Consequently, the task of providing an equal amount of employment through alternative uses of Air Force facilities is not nearly as formidable as that of replacing employment in a shipyard's land and buildings.

Perhaps a major factor determining the severity of the impact of a defense installation shutdown is the size of the affected work force in relation to total manufacturing employment in the area. If the installation is located in a large metropolitan area, then the closing of even a sizable manufacturing facility will have a relatively negli-

gible impact because the income loss will be spread over many trade and service outlets in the area. On the other hand, in smaller communities where the economic base is heavily dependent on the installation, the closing may cause a substantial decline in local employment.

Table 2 shows the number of affected personnel as a percent of manufacturing jobs in the area for the five largest closings in New England since 1961. The sharp contrast between the impact on Boston and Bangor, Maine, points up the extent of the differences.

TABLE 2.—Major defense closings of installations in New England, 1961-65

Action	Area	Date of announcement	Scheduled completion date	Personnel affected ¹	Civilian manufacturing employment—Year of announcement	Affected personnel as percent of manufacturing jobs
Presque Isle Air Force Base.	Limestone-Caribou ²	Mar. 30, 1961	Oct. 1, 1961...	1, 400	³ 1, 468	95
Dow Air Force Base.	Bangor-Old Town ²	Nov. 19, 1964	July 1968...	4, 500	³ 5, 775	78
Portsmouth Naval shipyard.	Portsmouth Naval shipyard study area.	.....do.....	Prior to July 1974.	7, 600	⁴ 34, 973	22
Springfield Armory..	Springfield-Chicopee-Holyoke SMSA.	.....do.....	April 1968...	2, 500	⁵ 68, 800	4
Watertown Arsenal..	Boston SMSA.....	Apr. 24, 1964	September 1967.	2, 100	⁵ 275, 700	1

¹ U.S. Department of Defense memorandum dated July 20, 1965; includes closings and reductions affecting 350 or more personnel.

² Areas defined as "economic areas" by Maine Department of Labor and Industry.

³ Total manufacturing employment. Maine Department of Labor and Industry, Census of Maine Manufactures (annual).

⁴ Covered employment in manufacturing, New Hampshire Department of Employment Security, Employment and Wages in Each Job Center (annual), and Maine Employment Security Commission (mimeographed), plus Navy Yard Civilian Employment.

⁵ Estimated total employment in manufacturing for the SMSA, U.S. Bureau of Labor Statistics, *Employment and Earnings* (monthly).

WATERTOWN ARSENAL

Because Watertown is an integral part of the Boston metropolitan area, the closing of the arsenal is having relatively few adverse effects on the community. Only a small proportion of the employees actually reside in the town. Moreover, about half of the work force are remaining in government employment in the Boston area. As a result, with about two-thirds of the closing already completed, only a small number of houses have become available. The Boston metropolitan real estate market has readily absorbed these and undoubtedly will be able to absorb any further turnover.

About a fifth of the workers are taking early retirement. A majority of these retirees are highly skilled and can readily find employment in the area if they wish. In fact, private employers have offered many jobs to Watertown workers but relatively few have been accepted. Because employment is not a major concern, Watertown officials have concentrated on another goal—how best to raise the tax base.

The town of Watertown will be given the right to buy a large part, 49 acres, of the arsenal property at fair market value if no Government agency can make full use of the land and buildings vacated. This is a

significant industrial development advantage because the property is one of the largest available near the core of the city. The town has created a redevelopment authority which is specifically authorized to buy the property and select the investor or group who will develop it. Because of the prime nature of the real estate, the officials of the redevelopment authority will have a choice of several attractive alternatives. Since the major criterion for the selection of the developer will be the net contribution to the town's tax base, a light industry or office complex will probably be favored over a residential development which might necessitate new school construction. A shopping center will probably not be considered because it would create more competition for downtown merchants. Representatives of light manufacturing and insurance firms have shown substantial interest with one developer anticipating the employment of 5,000 workers. Thus the town may achieve its reuse objectives with little effort.

THE SPRINGFIELD ARMORY

The Defense Department has also announced that the Springfield Armory will close in the spring of 1968. This decision was particularly difficult to accept because the workers have relatively few opportunities for comparable government jobs within commuting distance. Consequently, most workers will have to choose between moving or leaving government employment.

Fortunately, the current prosperity may make the transition relatively painless for the community and for many of the workers. Located in western Massachusetts, the Springfield-Holyoke-Chicopee complex is a medium-size metropolitan area with nonagricultural employment of 181,000 workers. It has a large, diversified and growing manufacturing base and armory workers represent only 3 percent of the area's manufacturing employment.

Because many skills are in short supply, area employers may be able to hire most workers who choose to take early retirement or severance pay. Average weekly earnings in manufacturing at \$105 in 1964 reflect a pay scale and fringe benefits only slightly lower than at the armory.

In addition to employers already located in the area, the combination of a pool of skilled workers and the possible availability of scarce machine tools may encourage an outside firm to take over part of the 100 acres of land and buildings that belong to the armory. Several large firms are reported to be interested.

Other uses for parts of the vacated land are also being seriously considered. One is the creation of a tourist attraction in the form of a small arms museum to include specimens made at the armory since the Revolutionary War. An expansion of the community's technical institute is under study for another complex of buildings. Moreover, a large lake with 11 acres of frontage on the armory's grounds may be used for the development of community recreation facilities. Thus, despite a slow start, Springfield may be able to make a satisfactory adjustment to the loss of the armory.

DOW AIR FORCE BASE

Dow, a Strategic Air Command base, established before World War II, is located in the outskirts of Bangor, Maine. The base occupies

3,400 acres, representing about 10 percent of the city's land area. It has a complement of about 4,000 military personnel and in addition provides employment for some 400 civilians. Closing is scheduled for July 1968.

The State of Maine and the city of Bangor are working together to develop a master plan that will take full advantage of the re-use potential of the base. Because government surplus property is available at little or no cost for conversion into educational, hospital, and municipal airport facilities, about half of the original investment of \$100 million is expected to be devoted to such public purposes. There is a possibility that the University of Maine will use some of the facilities to develop a separate 2,000 student campus. The base, located only 6 miles from the campus, contains messhalls, dormitories, and other buildings which could be made useful to the university and would be available for the cost of conversion. Moreover, the base's hospital may be developed to replace the present municipal chronic disease facility. And if the city agrees to accept responsibility for maintaining the airport, it can acquire that \$35 million facility for the payment of \$1. Although annual operating costs of \$400,000 appear high, they will be shared by many users including an Air National Guard unit and it is possible that the city will not have to pay any of these costs.

The base contains about 1,000 units of permanent housing, roughly 8 percent of the total in Bangor. At the date of closure, the U.S. Department of Defense will remain responsible for the \$13.5 million of mortgages outstanding on this housing. To prevent widespread disruption of the private housing market, some units will be used by the University of Maine for faculty and married student housing and some taken by the city to house people displaced by urban renewal projects. About 180 units will be leased by military personnel remaining in the area. Finally, 226 single family units will be placed on the market but should be easily absorbed by the expanded private activity in the adjacent industrial park.

The loss of the military payroll will undoubtedly have an adverse effect on Bangor, a city of about 39,000 inhabitants. However, the city plans to develop the remaining lands and buildings of the base into an industrial park which if successful will bring added income to the residents. In addition to being able to acquire the buildings at low cost, the park will also have the advantage of being adjacent to an interstate highway and a commercial airport, important considerations for many firms.

By the nature of the Air Force mission, the base will remain near full strength until closing. Its conversion is therefore still in the planning state, but the advance indications are that the transition will be relatively painless and productive.

THE PORTSMOUTH NAVY YARD

The problem resulting from the announced closing of the Portsmouth Navy Yard appears more serious, however. Since its inception in 1800, the Navy yard has been the major employer in this area of New Hampshire as well as in the southern tip of Maine. Fully one-fifth of the area's economic base is dependent on the Navy

yard. To soften the blow, the Defense Department provided a 10-year phaseout period.

Because of the demands of the Navy yard, the workers in the area are more educated and more skilled than the average for New Hampshire or Maine. The average educational level of the area's population is a half year above that of either State. Also the proportion of skilled workers to total manufacturing employment is 40 percent in the area as compared to 15 percent in Maine and New Hampshire.

Few government jobs are available within a commuting range of Portsmouth. If the Navy yard workers choose to remain government employees, as a majority did at the Watertown Arsenal, outmigration will be substantial and cause serious economic dislocation in the area.

The Portsmouth area well illustrates the varying impact of different types of defense installations on employment, for the area is dependent on the Pease Air Force Base as well as on the Navy yard. To compare their effects on the area's economy, this bank made an analysis of the secondary employment derived from each installation and from private manufacturing activities in the area. The results of the analysis suggest that the employment multiplier for Pease is 1.4 while that for the Navy yard is 1.6, and that for private manufacturing is 1.8. Thus, the loss of a job at Pease results in eliminating the support for 0.4 of a job in local employment, while the loss of each employee at the Navy yard causes a reduction of 0.6 of a job.

Using this analysis, if half the present Portsmouth Navy Yard labor force—about 3,650 workers—choose to accept other government jobs and migrate from the region, the support for some 2,200 jobs will be lost. Although these losses are not as great as they would be if a private manufacturing firm closed, the Portsmouth area will nevertheless need to do an exceptional job of industrial development promotion to prevent substantial outmigration.

If such outmigration does occur the real estate market will undoubtedly suffer some adverse effects. Several factors, however, should help prevent a complete collapse of this market. New residential construction in the area has been cut substantially since the announcement of the shipyard's closing. Over the 10-year phaseout period, continued cutbacks of building activity will limit the amount of surplus housing. In addition, some of the housing might be sold to people who work in northeastern Massachusetts.

In a few communities where defense bases have already closed, the Federal Housing Administration refrained from the immediate resale of the houses it repossessed. It thus helped to stabilize the local market. However, such action may not be needed in the Portsmouth area if industrial promotion efforts are successful.

A majority of the shipyard workers could take early retirement, remain in the area and supplement their benefits by taking other jobs. In the last 2 years private manufacturing employment has increased substantially in the area. In fact, employers complain of a labor shortage. Most of the growth in manufacturing employment, however, is concentrated in industries that pay considerably lower wage rates than shipbuilding. As shown in table 3, the average annual manufacturing wage in the area is \$4,800 as compared to \$7,000 for the Navy yard. However, some better-paying jobs may be available to Navy yard workers willing to commute 30 to 45 miles to northeastern Massachusetts.

TABLE 3.—*Comparison: Average annual wages in manufacturing, 1964*

[Portsmouth Naval Shipyard, other manufacturing in Portsmouth Naval Shipyard study area, State of New Hampshire, and State of Maine]

Area	Average annual manufacturing wage	Percent of Portsmouth Naval Shipyard annual wage
Portsmouth Naval Shipyard	\$6,999	100.0
Other manufacturing in study area	4,838	69.1
State of New Hampshire	4,302	68.6
State of Maine	4,527	64.6

Source: Shipyard figures: Shipyard commander, 1964 card count; State data: New Hampshire Department of Employment Security, employment and wages in each job center, 4th quarter, 1964 (includes covered employment only); Maine Department of Labor and Industry, Census of Maine Manufactures, 1964.

Thus, the Portsmouth area must attempt to capitalize on (1) the pool of skills potentially available when released from the shipyard; (2) the shipyard's buildings and land; and (3) its coastal location. In the postwar period one of the area's most important private manufacturing firms was attracted through its need for deep channel and ice-free harbor facilities. The firm's wage level and skill requirements have provided the type of industrial alternatives that might prevent substantial outmigration from the area.

The economic resources of the region are now being studied by the area's Seacoast Regional Development Association in cooperation with the University of New Hampshire. The results will provide the detailed statistics needed for a full-scale economic development program.

That Portsmouth faces difficult adjustment problems cannot be denied. Still other, smaller and more isolated communities have made successful adjustments to similar situations. One such community was Presque Isle, Maine.

THE PRESQUE ISLE STORY

Presque Isle is situated in the northeastern corner of Aroostook County, the most northern county in the State of Maine. When the closing of its Air Force base was announced in 1961, the 1,250 military personnel and the 250 civilian workers affected received a payroll of \$2.5 million representing more than half the economic base of the community.

With the aid of the development agency of the State of Maine, the Office of Economic Adjustment of the Department of Defense, the Area Redevelopment Administration of the Department of Commerce, as well as aggressive local leadership, the airbase property was developed in a number of ways. Representatives from all these groups worked together to develop the manufacturing potential of the natural resources in the area. With the aid of an ARA industrial loan a potato grading and processing plant was established. This plant has helped the local farmers capitalize on the recent nationwide potato shortage and the resulting high prices. Also a plywood manufacturing plant was set up to develop the hardwood potential of the area. Altogether about 900 new manufacturing jobs were created. (See table 4.)

TABLE 4.—*Manufacturing employment in Presque Isle, Maine, before and after
airbase shutdown, Mar. 30, 1961*

Year:	Number employed
1957.....	189
1958.....	266
1959.....	253
1960.....	246
1961.....	400
1962.....	871
1963.....	1, 137

Source: Census of Maine Manufacturers.

In addition, because the law provides that States or communities can take over surplus military property without charge if it is to be used for educational or hospital services, the State of Maine was able to use some of the property to establish the Northeastern Maine Vocational Education Institute. Moreover, the base was used to develop excellent commercial airport facilities. Thus, intelligent and aggressive local, State, and Federal leadership combined to achieve a minor miracle in industrial development.

HOW TRANSFERABLE?

What part of the Presque Isle experience can be applied to other communities affected by a defense installation closing? Of course, not every area has as much unrealized manufacturing potential as Presque Isle with its potato and hardwood resources. On the other hand, most communities have the advantage of being considerably less isolated. Moreover, the current prosperous state of the economy and the resulting labor shortages will make adjustment easier than in periods of recession.

Every affected community can benefit from the positive efforts of its leaders in a carefully planned industrial development effort. Also the Office of Economic Adjustment in the Department of Defense is available to assist in these efforts. Not only does this Office provide technical advice, it may also be able to expedite and coordinate various types of Federal assistance from other agencies, as it did in the case of the ARA loan for the Presque Isle potato processing plant.

The availability of good industrial land and buildings is a prime asset in any industrial development program. In most cases, when a base is closed, the Department of Defense liquidates its holdings of land and buildings. Because the buildings are defense oriented, their fair market value for peaceful purposes is typically substantially less than the original cost. The immediate resale price is also considerably lower than it would be if the property were subdivided and held for a period of 5 to 10 years. Consequently, the community may be able to obtain a potentially valuable complex of land and buildings if imagination is used to redevelop such surplus property. Affected communities that can bring about a relatively smooth transition may develop new approaches to industrial development that will prove invaluable if and when general disarmament necessitates similar adjustments on a more massive scale.

PART II: IMPACT ON DISPLACED WORKERS

To cushion the impact on the workers of closing defense installations, the Department of Defense has guaranteed a job offer to each permanent civil service employee who is displaced. The offer, however, would not necessarily be in the same community or even at the same rate of pay. While not eliminating the psychological problems arising from the need to transfer job and sometimes home surroundings, these workers at least have the security of knowing that other jobs are available for them. This opportunity to transfer is of course totally different from the threat of unemployment which may face workers displaced by the closing of a private manufacturing facility. The transfer system has thus benefited the displaced workers who have on the whole shown a marked preference for continuing in government employment even if moving is necessary. It has also benefited the Department of Defense by providing a pool of skilled workers for installations with expanding needs under the pressures of the Vietnam buildup.

COMPUTERIZED TRANSFER SYSTEM

On November 20, 1964, Secretary of Defense McNamara announced that each permanent civil service worker displaced by a defense installation closing would be entitled to the offer of one job within the Department. At that time, he imposed a temporary freeze on hiring new blue collar workers within the Department but this general freeze was soon replaced by a relatively sophisticated system of selective freezes. These provided that all suitable openings be made available to displaced workers without restricting hiring of other personnel for jobs which displaced workers could not or would not fill.

An integral part of this nationwide clearinghouse system is the computerized location of job openings. Every 2 weeks the computer prepares a "stopper sheet" for any installation in which a displaced worker has indicated interest. The installation is then required to review displaced candidates with appropriate skills before being free to promote from within the base or hire in the local labor market.

For the worker, participation in the centralized referral system is purely voluntary. If, however, he chooses not to participate or unduly limits the locations to which he would move, he sacrifices his guarantee of a job offer. Still, every effort is made to find an opening that meets his desires.

Each worker receives job counseling designed to explain the alternatives and to aid him in making the best use of the transfer system if he decides to participate. The counseling provides a description of installations with skill needs where suitable openings will probably occur. Once a worker designates a location as satisfactory, he is expected under normal circumstances to accept an appropriate job there. If the worker refuses one offer—all he is guaranteed—he is given a lower priority rating and the hiring installation is allowed to fill the vacancy by promoting from within. If the worker refuses a second offer, his name is dropped from the clearinghouse system.

Although this method may seem harsh, hiring at installations where workers are needed cannot be delayed indefinitely. In fact, displaced workers have refused 36 percent of the jobs offered and thus many have

lost their job guarantees. Such refusals of course reflect the well-known immobility of workers, particularly those with blue collar skills.

Although the Defense Department has made many efforts to be of assistance, the displaced workers have two major complaints. First, when an installation actually makes a job offer, the worker is allowed only 24 to 48 hours to decide whether to accept or reject it. The workers feel that this time period is insufficient and that they should be allowed at least a week for a final decision. Second, many workers are required to decide without being given an opportunity to see the areas or installations with job openings. The Department does allow workers time off to visit adjacent installations but there are no regular provisions for workers to visit distant bases.

WORKER EXPERIENCE

One advantage of the computerized central referral system is that it provides information on the placement experience of the workers who choose to register. These include well over half the workers displaced by closures of large installations; they also include workers laid off as a result of cutbacks in employment at some operating installations.

As table 5 indicates, about 92 percent of the 14,700 registered workers who have been placed have been transferred within the Department of Defense. About 6 percent have taken jobs in other government departments but only 1.4 percent of those registered took jobs in private industry. This estimate of private placements, however, is an understatement. Many workers who originally registered to transfer later chose to take advantage of the special early retirement privileges and have since found jobs privately. Even after making a rough adjustment for these retirements, it appears likely that for the Nation as a whole no more than one out of eight displaced workers who registered with the centralized referral system has entered private industry.

TABLE 5.—*Placement of civilian personnel affected by closures and cutbacks, registered in centralized referral system (CRS), Aug. 31, 1966*

	Percent
Placed by centralized referral system within department.....	44.7
Otherwise transferred within Department of Defense.....	15.0
Transferred outside Department of Defense.....	6.4
Reassigned or reinstated at same institution.....	32.6
Placed in private industry.....	1.4
Total.....	100.0

¹ May not add to 100 due to rounding of figures.

Source: U.S. Department of Defense, CRS Monthly Computer Report.

SAME PAY

Most workers who succeeded in getting other government jobs were able to maintain their pay levels. As table 6 shows, more than two-thirds of the placements were made at the same or higher grades. Moreover, not all those rehired at a lower grade took a paycut. Under the Department's transfer system, a worker's former wage rate can in many circumstances be maintained for 2 years before application of the new wage rate is mandatory. Since most workers who were rehired at a lower level lost only one or two grades, subsequent wage adjustments will minimize any loss in pay.

TABLE 6.—Placements by CRS system within Defense Department, Aug. 31, 1966

	Placements					
	Inside area		Outside area		Total	
	Number	Percent	Number	Percent	Number	Percent
Higher grade.....	170	7	260	6	430	6
Same grade.....	1,331	55	2,795	66	4,126	62
Lower grade.....	910	38	1,162	28	2,072	31
Total.....	2,411	100	4,217	100	6,628	100

¹ May not add to 100 due to rounding of figures.

Source: U.S. Department of Defense, CRS Monthly Computer Report.

VARIATIONS BY REGION

For the Nation as a whole about three-fifths of the placements have been made outside the commuting area. This experience however, has not been uniform by region. As table 7 shows, displaced workers in Boston and Philadelphia have been exceptionally fortunate. More than three-fourths of the Boston district workers and two-thirds of those in Philadelphia were able to obtain transfers within the commuting area. By contrast, in another district with a large number of displacements—Atlanta—only a fourth of the workers were able to remain in the locale. These differences depend primarily, of course on whether other local defense installations are expanding employment at the time of a particular closing. In one case in the Philadelphia district many displaced workers had merely to walk across the street to be absorbed by an expanding installation.

TABLE 7.—CRS Government placements within commuting area by district, August 31, 1966

	<i>Percent of total within commuting area</i>
Boston.....	77.3
Philadelphia.....	66.7
New York.....	46.9
United States.....	36.7
Seattle.....	29.3
Atlanta.....	25.8
Chicago.....	23.1
San Francisco.....	22.9
Denver.....	19.4
Dallas.....	11.7
St. Louis.....	11.1

Source: U.S. Department of Defense, CRS Monthly Computer Report.

As would be expected four out of five refusals of alternative government jobs were for those requiring relocation. (See table 8.) In both the Boston and New York districts, however several hundred defense jobs within commuting distance were also turned down. These two districts also had the highest rate of refusals to total offers. Although this high incidence of refusals may reflect the strong economic climate, it may also indicate that workers in the Northeast are more immobile.

THE WATERTOWN ARSENAL WORKERS

Ninety percent of the permanent Arsenal personnel have already adjusted to the closing and are no longer working there. About half have transferred to other government jobs in the Greater Boston area. The largest number found work at the Boston Navy Yard and about 225 workers were hired by the U.S. Army Materials Research Agency located within the arsenal grounds. At least 37 people went to work for the NASA installation in Cambridge. Ironically 26 workers transferred to the Portsmouth Navy Yard even though it is scheduled to close by the mid-1970's. As the map on page 14 shows, the rest are scattered throughout the country; three have moved as far as Hawaii and one has accepted an overseas assignment in Japan.

The arsenal experience illustrates the strong tendency of all displaced Defense Department civilian workers to remain in government employment if at all possible. Despite ample opportunities for most Watertown workers no more than one worker in four will enter private employment. Many firms sent personnel teams into the arsenal in an attempt to recruit skilled workers. The bulk of the response to these offers come from those who were able to take early retirement and about two-thirds of that group took jobs in private industry. Other workers were entitled to severance pay which—depending on age and length of service—could amount to a year's salary.

NEW LOCATIONS OF WATERTOWN ARSENAL WORKERS:
ACCEPTING GOVERNMENT TRANSFERS

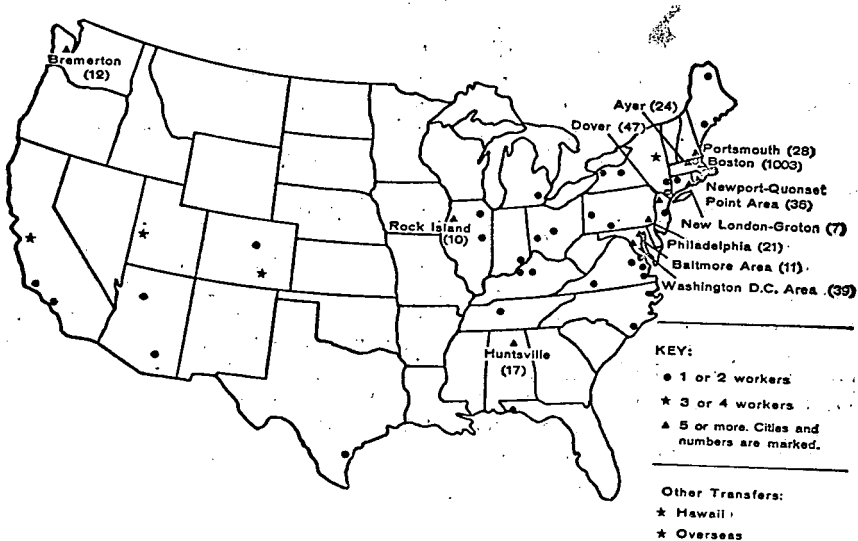


TABLE 8.—*Rejections of registrants to CRS job offers by wage rates and locality, Aug. 31, 1966*

	Rejections					
	Inside area		Outside area		Total	
	Number	Percent	Number	Percent	Number	Percent
Higher grade.....	39	5	107	4	146	4
Same grade.....	496	59	2,182	74	2,678	71
Lower grade.....	310	37	638	22	948	25
Total.....	845	100	2,927	100	2,772	100

¹ May not add to 100 due to rounding of figures.

Source: U.S. Department of Defense, CRS Monthly Computer Report.

THE SPRINGFIELD WORKERS

The major effort to relocate the workers at the Springfield Armory will take place this fall. As of August 31 only 762 of the 2,400 workers had left the armory. However, the same strong preference for continued government service appears evident. Sixty percent of those who have left have taken other government jobs. Less than half have had to relocate. The majority have found government jobs at a nearby Air Force base or are commuting 25 miles to Hartford, Conn. Only 6 percent have entered private industry directly although many of the 187 early retirees will undoubtedly also do so.

CONCLUSION

In this period of nearly full employment, workers displaced by the closing of Defense installations have many attractive work alternatives. Although the prospect of changing jobs and communities is psychologically disturbing, most will fortunately be spared such problems as were faced by displaced textile workers when the mills shut down.

A majority of these workers are willing to be moved to continue their employment in the government. Clearly, the desire to preserve their fringe benefits is strong enough to overcome their well-documented immobility. This conclusion may have significant implications for private employers who, with the increasing scarcity of skilled labor, may find it economic to underwrite the moving costs of blue collar workers displaced by the closing of inefficient units. Thus, the Defense Department's transfer program may well serve as a prototype to increase mobility and reduce the problems of workers displaced by changing economic conditions.

Some of the analysis in the preceding article was developed into a research report, "Estimation of Differential Employment Multipliers in a Small Regional Economy," by Steven J. Weiss and Edwin C. Gooding.

SOME IMPLICATIONS OF THE ECONOMIC IMPACT OF DISARMAMENT ON THE STRUCTURE OF AMERICAN INDUSTRY*

I. INTRODUCTION

A large proportion of our resources are devoted to the production of intermediate products which are incorporated in goods and services delivered to final demand. With given technology and prices of inputs, the character of final products will determine the composition of industrial output. If the demand for final goods is varied, then the composition of industrial output may be substantially altered. Specifically, the substitution of private or nondefense government spending for military hard goods purchases is likely to require a substantial reallocation of industrial resources, not only in terms of final goods, but also in terms of intermediate materials, supplies and components.

To investigate some of the major structural problems which might arise from shifts in defense expenditures to either the private sector or to other public nondefense sectors, an input-output model was implemented specifying three alternative full-employment patterns of end product deliveries for the year 1970. The model constructed was static, open on consumption with investment and government purchases stipulated as first order input requirements. The structural matrix consisted of an enumeration of 66 processing sectors derived from the Bureau of Labor Statistics 192 order Emergency Mobilization Model. The model is similar to the Leontief-Hoffenberg model, and the study is an extension of their basic research on disarmament reported in *Scientific American*.¹

The end product of the Leontief-Hoffenberg study is a 57 by 8 matrix whose elements are ratios permitting relatively easy computations of gains and losses in output and employment through scalar multiplication. The 57 rows in the matrix represent an exhaustive enumeration of the economy's industrial processing sectors and the eight columns identify major military and nonmilitary final demand components. The ratios were derived after computing the direct and indirect requirements of each i th processing sector to each j th demand component necessary to support the level and composition of final demand for the year 1958. Each ij th total requirement was proportioned to the corresponding j th sum of final demand (direct requirements). As such each ratio specifies the direct and indirect requirements of the i th industry to the j th demand component necessary to support \$1 million worth of final demand by the j th category of demand.

Net changes in output by processing sector may be established for any magnitude hypothesized by shifting final demand from military

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I am grateful for advice and suggestions given by Charles L. Schultze and Marvin Hoffenberg.

¹Wassily W. Leontief and Marvin Hoffenberg, "The Economic Effects of Disarmament," *Scientific American*, vol. 204, No. 4 (April 1961), pp. 47-55.

to nonmilitary categories. This may be accomplished by obtaining the scalar-vector product of the assumed defense cut times the ratios in the military vector, then obtaining the scalar-vector product of the assumed defense cut times any nonmilitary demand vector, and finally subtracting the military product vector from the nonmilitary product vector. The resultant vector yields the net gains and losses in total output by industry for the 57 industries consistent with the magnitude assumed to be shifted from military to nonmilitary demand.

The major advantages of the matrix developed by Leontief and Hoffenberg are its flexibility and generality in computing impacts on the economy's processing sectors for shifts in final demand. Although the table was derived to show the impact of shifting defense expenditures to other categories of final demand, it may be used to compute impacts for any shift in expenditures from one category of demand to another. For example, one could compute the impact of shifting expenditures from investment in producers durables to highway construction or from personal consumption to government nonmilitary or any other combination that might reasonably be expected to accompany a change in economic policy.

The flexibility of this technique does impose some limiting assumptions on the model which may effect the accuracy of the derived impacts. Since the derived ratios are based on a specific set of final demand requirements, the scalar multiplication and subtraction of the product vectors is a short cut technique for computing the new level of total requirements brought about by changing the relative level of two or more final demand component aggregates without changing the internal composition of direct requirements. This implies that the relative composition of direct requirements for each demand component remains constant. Consequently shifts in expenditures from one demand component to another assume that the composition of direct requirements is affected proportionately.

The assumption of proportionate requirements accompanying any variation in the level of demand carries with it certain important implications. First, any cut back in military expenditures assumes that every existing weapon system is reduced in proportion to its original level which means that the technique may preclude analysis of a reduction in expenditures consistent with a nuclear disarmament. Second, any shift offset by increases in personal consumption assumes unitary elasticity of income for all commodities and hence a proportionate increase in demand for the output of all industries. Third, offsets through increased government nonmilitary expenditures assume that all existing programs will be increased proportionately. Although these are simplifying assumptions, if the magnitude approaches say 50 percent of the defense budget then these assumptions might be too restricting.

It is the purpose of this study to extend the pioneering efforts of the Leontief-Hoffenberg model by dropping the assumption of constant proportionality between demand categories and production sectors when allocating offset demand. The elimination of these assumptions requires that a new set of direct requirements or bill of goods be derived for each offset considered. Each set of direct requirements specified must be multiplied by the structural matrix in order to generate the intermediate pattern of demand consistent with the stipulated offset. The resulting product matrices must then be evaluated with reference to the pattern established for the armed economy.

This procedure sacrifices the flexibility of the Leontief-Hoffenberg model but enables one to determine the effects of probable changes in the internal composition of the final demand components on the output levels of the processing sectors.

II. METHODOLOGY AND ASSUMPTIONS

1. FINAL DEMAND

To test the impact of varying compositions of material requirements with a static input-output model consistent with a reduction in defense expenditures to the exclusion of all other exogenously influenced variables, the disposition of final demand for the armed and disarmed economy should be based on well behaved aggregates. That is to say the impact on structure could be isolated more precisely if (a) resources were fully employed with labor at the controversial 4 percent unemployment rate and plant utilization in the vicinity of 90 percent of capacity; (b) Federal, State, and local budgets were reasonably balanced; and (c) all other cyclical influences were minimal. It is difficult to discern what the structural impact would be if one uses data based on aggregates derived from an economy with high rates of unemployment and excess capacity, or excess demand and rising prices. Consequently aggregate supply and demand were projected to 1970 so that all variables could be controlled and a well behaved economy simulated. In addition to minimizing cyclical variation, requirements based on projected estimates for 1970 permit evaluation of shifts in the composition of demand for the economy at a time when arms reductions might be enacted. Granted arms reductions may not take place in 1970, 1975, or ever, but they will not take place in 1959, 1960, or 1961 either and the relative values of some aggregates are expected to change independently by 1970, i.e., total purchases of goods and services by State and local governments should surpass Federal purchases by 1970 even if the present level of defense is maintained.

Aggregate supply for 1970 was projected based on the following assumptions: (1) the total labor force would reach 85.9 million with 3.3 million unemployed (4 percent of the civilian labor force), (2) the Armed Forces would remain constant at 2.5 million, Federal civilian employment would rise moderately from present levels of 1.7-1.9 million to 2 million, and that State and local employment would continue to advance at a faster rate from 4.9 million to 6.6 million, (3) the level of average real wages paid to government employees would increase during the decade—military from \$3,500 to \$5,000, Federal civilian from \$5,100 to \$6,700, and state and local from \$3,900 to \$4,200,² (4) private average weekly hours would decline to 37.5, and finally (5) the average annual rate of change in productivity for the private sector would be 2.68 percent per year.

A projection of aggregate demand was derived by independently estimating personal consumption expenditures, gross private investment, and government purchases of goods and services consistent with the increases in gross output and income implicit in the supply function.

² The estimates are given in 1959 dollars so that they will be consistent with the 1959 price structure implicit in the projection of the private sector. If the projection of compensation was based on current dollar payments, the real purchasing power of government employees relative to the private labor force would be overstated given the level of prices assumed.

The general methodology for obtaining these measures may be stated briefly. First, the investment and government components were estimated by projections of ratios and trends of historic data covering the postwar period and extrapolated to 1970. Second, reasonable savings rates and a functional income distribution were stipulated yielding an implied level of aggregate consumption. Third, taxes were adjusted to produce a consumption level which together with the level of investment and government purchases sum to the supply estimate of gross national product. In other words, after independently estimating investment, government expenditures, and reasonable savings rates, tax rates were adjusted to insure aggregate demand equal to full employment aggregate supply.

This method requires one major assumption; namely, the split between government spending and personal consumption expenditures. Operating under the assumptions used in this study, the derived relationships appear reasonable with respect to past experience.³ Admittedly, the assumption involves a political judgment. For example, a lower estimate of government spending would have led to a reduction in taxes and a higher level of consumption and investment. However, the judgment could not be avoided since an explicit assumption with respect to the split had to be made. On the other hand, the input-output model is only mildly sensitive to reasonable variations in the assumed split. A summary of the projections is shown below in Table I. It should be emphasized that the levels projected and shown in the table have been adjusted under the assumption that the initial capacity projected would be utilized.

2. DIRECT REQUIREMENTS

The projected estimates of the major final demand components were used as control totals for stipulating the final requirements on the processing sectors for each of the three alternatives considered. The assumptions and methods for converting aggregate demand to specific industry requirements may be briefly outlined.

³ The ratios of consumption to GNP and government purchases to GNP for the period 1955-59 (computed from Commerce data in constant dollars), and the derived ratios for 1970 are as follows:

[In percent]

Year	Consumption	Government	Year	Consumption	Government
1955.....	64.7	18.6	1958.....	65.9	19.8
1956.....	64.4	18.0	1959.....	65.1	18.7
1957.....	64.3	18.5	1970.....	64.9	18.9

Personal consumption expenditures were estimated in purchaser values on a commodity basis for 55 categories. An average ratio of each expenditure category to aggregate disposable income was computed by relating consumption to income, relative prices, and time. Although various functional relationships were tested for goodness of fit, the regression equations used to derive all the estimates were of the general form:

$$X_i/Y = a + b_{12.34}Y + b_{13.24}Z_i + b_{14.23}T$$

where;

X_i = personal consumption expenditures in constant 1954 dollars
for the i -th commodity

$i = 1, 2, \dots, 55$

Y = disposable personal income in constant 1954 dollars

Z_i = an index of relative prices for the i -th commodity

$i = 1, 2, \dots, 55$

T = time

The parameters were established by using annual values for the 13-year period 1947-59.

Even though variations in consumption expenditures may be explained by variations in current income, previous income, rate of change in income, changes in the price level, interest rates, and holdings of liquid assets, previous studies indicate that the long-run variations in consumption are highly correlated to variations in current income.⁴

⁴ See for example Michael Sapiro, "Review of Economic Forecasts for the Transition Period," *Studies in Income and Wealth*, vol. 11, 1949, pp. 302-317; Robert Ferber, "A Study of Aggregate Consumption Functions," Technical Paper 8, National Bureau of Economic Research, 1953; and Louis Paradiso and Mabel A. Smith, "Consumer Purchasing and Income Patterns," *Survey of Current Business*, vol. 39, No. 3 (March 1959), pp. 18-23.

TABLE I.—*Projection of gross national product, 1970*
 [In billions of 1959 dollars]

	1959	1970
Supply:		
Labor force (millions).....	71.9	85.9
Armed Forces (millions).....	-2.5	-2.5
Civilian labor force (millions).....	69.4	83.4
Unemployed (millions).....	-2.7	-3.3
Total civilian (millions).....	66.7	80.1
Government civilian (millions).....	-6.7	-8.6
State and local (millions).....	5.0	6.6
Federal (millions).....	1.7	2.0
Total private (millions).....	60.0	71.5
Agricultural (millions).....	5.8	4.2
Nonagricultural (millions).....	54.2	67.3
Private average weekly hours.....	39.1	37.5
Private average yearly hours.....	2,033.2	1,950.0
Private total man-hours (millions).....	122.0	139.4
Private output per man-hour (2.68 percent).....	\$3.62	\$4.84
Plus Government product.....		\$53.5
Total GNP (supply).....		\$728.3
Demand:		
Personal consumption expenditures.....	\$313.8	\$472.5
Gross private domestic investment.....	71.0	117.9
Plant and equipment.....	43.7	77.9
Residential construction.....	22.3	30.0
Inventories.....	5.9	7.0
Net export.....	-9	3.0
Government purchases of goods and services.....	97.2	137.9
Federal.....	53.3	65.8
State and local.....	43.9	72.1
Total GNP (demand).....	483.0	728.3

Sources: Solomon Fabricant, *Basic Facts on Productivity Change*, Occasional Paper No. 63, National Bureau of Economic Research; "Technical Supplement No. 1," *Derivation of the 1970 Judgment Model*, report prepared by the National Planning Association, 1958; *Projection of the Labor Force, to 1975* Bureau of the Census, Current Population Reports, Series P25, No. 197; R. N. Goldsmith, *A Study of Saving in the U.S.*, vol. III, 1956; Edward B. Edwards and others, *The Next Decade and Its Opportunities for the Savings and Loan Business*, Indiana University, 1959; Otto Eckstein, *Trends in Public Expenditures in the Next Decade*, Committee for Economic Development, 1959; Bureau of the Budget, *Special Study, Ten-Year Projection of Federal Budget Expenditures*, Executive Office of the President, 1961; Clarence Long and Selma Mushkin, "Welfare Programs and Economic Growth and Stability," Joint Economic Committee Compendium, *Federal Expenditure Policy for Growth and Stability*, 1956; Office of Business Economics, *U.S. Income and Output*, Department of Commerce, 1958.

The set of regression equations was used to establish the level of final demand for the 55 categories of personal consumption based on the aggregate projection of personal disposable income. Subsequently, the set was used to derive new levels of consumption consistent with the projected increase in disposable personal income accompanying the tax cut hypothesized by the private offset. This procedure permitted changes in the disaggregated composition of personal consumption expenditures based on the shift from military demand to private demand. Finally, the 55 commodity estimates were converted to industry demands, and the converted estimates aggregated by industries were analysed for an armed and a disarmed economy assuming a private offset.

The industry estimates for the government and investment components of final demand do not represent purchases of final products, but estimates of direct requirements necessary to supply final products to these categories of demand. For example, the military purchases tanks from the ordnance industry; however, ordnance has been formulated as an exogenous sector and therefore does not appear in the system of equations connecting the endogenous sectors

together. Consequently, the requirements for goods and services for the production of tanks by the ordnance industry appear as direct requirements by the military on the remainder of the processing sectors. Similarly the requirements by the investment industries to produce final goods are distributed among the remainder of the processing system. The inclusion of investment demand in the bill of goods is based on the assumption that decisions with respect to the level of investment are essentially autonomous in nature and often tend to be unrelated to current production. Furthermore, the lack of interaction of military suppliers with the other processing sectors indicates that their inclusion in the system of equations connecting the endogenous sectors would be in most instances trivial. For example, very few industries require purchases of tanks to meet their requirements for final demand.

III. THE MODEL AND RESULTS OF COMPUTATIONS

The model consists of (1) a 66 order square structural matrix; (2) two 15 by 66 direct requirements matrices; and (3) one 16 by 66 direct requirements matrix. The first 15 by 66 requirements matrix was stipulated consistent with the composition of final demand for the economy supporting the military establishment at the level witnessed between 1955 and 1958. The second and third matrices were stipulated after computing reductions for demands by major military weapons systems and hypothesizing alternative offset policies. Each column vector in the requirements matrices was derived to support the level and composition of a specific component of final demand.

Multiplication of the direct requirements matrices by the structural matrix determined the total requirements of the processing sectors necessary to support the level and composition of demand based on variations in policy toward the level and composition of defense expenditures. The first product matrix specified total requirements by industry comparable to those derived by Leontief and Hoffenberg for 1958. The second product matrix specified total requirements by industry based on a 50-percent reduction in military procurement offset by a compensating reduction in personal income taxes and corporate income taxes.

Although total military procurement expenditures were cut by 50 percent, the reduction was distributed disproportionately to the composite military demand vectors reflecting the assumption of a policy of nuclear disarmament.⁵ Holding all other government non-defense purchases constant, the reduction in defense spending creates a potential government surplus. Therefore, once the new level of defense has been stated, the problem of redistributing the government surplus must be handled. The second matrix assumed that government revenue would be reduced to the new lower level of expenditures, that redistribution occurred instantaneously, and that the increased income generated would be readily absorbed into the private sector.⁶

⁵ The reductions were as follows: aircraft and missile procurement, 63 percent; other major procurement, 43 percent; procurement for maintenance and operations, 40 percent; and procurement for research and development, 37 percent.

⁶ In essence, the economy was viewed as if the transition had taken place and the former level of gross national product maintained. Granted, this reasoning assumes away an important temporal problem of maintaining demand during the period of transition. This problem has been considered by Benoit and Suits using the READ model, see Emile Benoit, "The Disarmament Model," and Daniel B. Suits, "Econometric Analysis of Disarmament Impacts," in *Disarmament and the Economy*, Emile Benoit and Kenneth E. Boulding, Eds. (New York, Harper & Row, 1963), pp. 28-49, 99-111.

TABLE II.—*Relationship of disarmament alternatives to armed economy*

[In millions of 1947 dollars]

Industry classification	Direct requirements armed economy	Direct requirements disarmed economy private offset	Direct requirements disarmed economy public offset	Direct and indirect requirements armed economy	Direct and indirect requirements disarmed economy private offset	Direct and indirect requirements disarmed economy public offset
Livestock and poultry.....	39,982	40,252	40,021	81,274	82,524	81,463
Grain and feed crops.....	982	973	986	14,711	16,649	14,820
Food products.....	37,570	36,911	37,618	57,972	57,781	58,153
Tobacco manufacturers.....	7,439	7,432	7,439	22,046	22,385	22,169
Alcoholic beverages.....	3,687	3,721	3,686	14,095	14,466	14,204
Cotton synthetics.....	6,769	6,953	6,776	21,431	22,054	21,519
Apparel.....	20,014	20,379	20,137	37,093	37,922	37,309
Leather and leather products.....	3,760	3,916	3,787	10,978	11,375	11,085
Plastics.....	545	532	515	7,347	7,490	7,194
Logging, sawmills.....	8,937	9,147	9,128	16,800	17,250	17,128
Pulp, paper and products.....	1,791	1,795	1,935	10,610	10,798	10,975
Industrial inorganic chemicals.....	1,239	1,230	1,729	7,914	8,025	8,626
Industrial organic chemicals.....	189	194	195	8,451	8,601	8,647
Miscellaneous chemicals and paint.....	4,554	4,678	4,684	18,650	19,170	18,836
Drugs and medicines.....	6,079	6,315	6,177	16,186	16,709	16,376
Rubber and rubber products.....	1,414	1,451	1,455	10,367	10,643	10,455
Nonmetallic minerals.....	4,913	4,913	5,226	10,670	10,799	11,140
Petroleum and petroleum products.....	7,371	7,145	7,302	14,935	14,640	14,841
Coal.....	1,794	1,846	1,961	4,438	4,527	4,668
Coke and products.....	469	486	514	7,841	7,915	8,188
Iron and steel.....	1,180	1,129	1,236	8,246	8,292	8,485
Iron and steel forging.....	367	353	378	5,588	5,646	5,705
Copper.....	419	343	356	7,776	7,785	7,729
Aluminum.....	-77	-84	-82	4,947	5,073	5,233
Other nonferrous.....	-618	-642	-641	5,450	5,587	5,515
Metal containers.....	102	100	92	8,197	8,354	8,367
Cutlery tools.....	1,177	1,168	1,195	5,921	5,986	6,027
Plumbing and heating.....	2,546	2,566	2,612	9,073	9,169	9,244
Metal stampings.....	593	565	606	6,539	6,581	6,650
Fabricated metal products.....	4,303	4,265	4,597	10,900	10,973	11,336
Engines and turbines.....	784	813	806	6,993	6,992	7,126
Construction and mining equipment.....	2,484	2,612	2,742	8,218	8,330	8,577
Farm and industrial tractors.....	3,001	3,225	3,113	9,780	10,059	10,014
Machine tools.....	1,498	1,568	1,480	5,793	5,862	5,845
Industrial machinery.....	5,858	6,353	5,912	10,907	11,241	11,036
Power transmission.....	-30	-33	-31	1,986	1,841	2,048
Pumps and compressors.....	676	709	707	6,940	6,808	7,063
Refrigeration equipment.....	2,366	1,763	2,382	10,379	9,757	10,496
Motors and generators.....	944	886	847	6,897	6,967	6,881
Insulated wire and cable.....	2,131	2,228	2,228	8,840	9,081	9,022
Electrical appliances.....	2,971	2,601	2,979	10,102	9,790	10,201
Radio and related products.....	2,987	3,160	3,002	10,456	10,877	10,574
Communication equipment.....	1,775	1,584	1,615	7,465	7,421	7,221
Electrical equipment.....	1,486	1,598	1,493	7,463	7,733	7,544
Motor vehicles and trailers.....	16,963	17,786	17,480	29,683	30,925	30,498
Aircraft and parts.....	8,971	4,962	6,441	14,659	10,362	11,955
Ships and boats.....	1,502	1,118	1,076	7,038	7,828	7,739
Locomotive and railroad cars.....	575	615	587	9,437	9,654	9,576
Photography equipment.....	2,429	3,208	2,266	7,891	8,850	7,810
Miscellaneous manufacturing industries.....	5,760	5,756	5,901	14,228	14,431	14,492
Electric light and power.....	2,258	2,196	2,734	4,080	4,067	4,632
Gas utilities.....	778	109	810	4,863	4,875	4,928
Railroads, trucking.....	11,757	12,168	12,385	17,474	17,374	18,189
Overseas transportation.....	422	511	394	4,705	5,080	4,774
Air transportation.....	755	946	788	6,639	6,831	6,590
Local and highway.....	2,733	2,594	2,709	8,746	8,836	8,801
Trade.....	72,360	74,543	72,639	78,672	81,272	79,047
Auto and other repair.....	6,508	7,093	6,870	21,853	23,127	22,462
Printing and publishing.....	4,506	4,658	4,744	9,647	9,942	10,022
Advertising.....	644	693	646	6,954	7,204	7,156
Telephone and telegraph.....	8,034	8,319	8,235	10,480	10,903	10,709
Banking, finance, and insurance.....	22,907	25,212	23,262	29,870	32,741	30,334
Real estate and rent.....	51,931	56,308	52,200	56,287	60,828	56,625
Motion picture and other.....	4,279	4,494	4,279	10,810	11,441	10,874
Service industries.....	11,976	12,564	12,047	20,311	21,347	20,482
Medical, dental, professional.....	21,232	25,028	22,096	29,679	33,816	30,691

The third product matrix specified total requirements by industry based on the 50-percent reduction in military procurement offset by compensating increases in Federal, State, and local nondefense procurement. 25 percent of the offset was directly allocated by the Federal Government—one-half for space exploration and one-half for increases in all other Federal projects. The remaining 75 percent was transferred to State and local governments for metropolitan development and urban renewal, State hospitals, education, and construction.

Table II summarizes the total direct industry output requirements and the total direct and indirect industry requirements for the armed economy and the two offsets considered. A few general observations may be made concerning the output levels presented in this table. First, a more extensive variation in direct requirements is recorded by each industry than the variations recorded for its total requirements. This may be explained in part by the level of aggregation. A 66 order aggregation attributes a broad enough production base to the firms classified within each industry to meet the change in the composition of demand consistent with the shifts in defense hypothesized. Second, direct industry requirements are more sensitive to policy alternatives than total requirements. Again the level of aggregation may influence these results, but more likely, the degree of dependence on direct requirements. For example, approximately 50 percent of the livestock and poultry industry's output is necessary to meet the demand of final buyers. The modest increase in direct requirements brought about by the disarmament alternatives leads to a modest increase in total requirements. The livestock and poultry industry is highly independent with respect to shifts in the composition of final demand accompanying a shift in defense expenditures. On the other hand, the iron and steel industry displays a much higher dependence on the demands of other industries. Hence the stipulated variation in direct requirements is dampened when the pattern of intermediate output is generated.⁷

The degree of an industry's interdependence and its sensitivity to shifting defense expenditures is given by the relationships presented in Table III. The ratios relate the new level of requirements stipulated and generated for each alternative to the level derived for the armed economy in each industry. The first two columns show the stipulated first round impacts on direct output, and the following three columns indicate the significance of the impact when related to the original total output. The last two columns show the variation in total output brought about by pursuing either policy.

Taken together industry by industry, these relationships permit a useful classification for measuring the extent of structural impact. The criterion for classification is the level of an industry's production base relative to its direct requirements. Industries may be grouped into three categories using the criterion on an arbitrary basis. An industry with a *broad* production base will be defined as one that ships less than 30 percent of its total output to final buyers. (See

⁷ This generalization holds true for all similar industries except the grain and feed crops industry.

col. 3, Table III).⁸ An industry that ships between 30 and 70 percent of its total output to meet direct requirements will be categorized as one with a *diversified* production base, and finally a *narrow* production base will be associated with an industry that ships over 70 percent of its total output to final users.

Of the 66 industries listed, thirty seven have broad production bases, five have narrow production bases, and the remaining twenty-four fall in the diversified class. Industries with broad production bases display a high degree of indifference to shifts in defense spending with respect to variations in total output even though the offset produces wide variations in direct requirements (see for example iron and steel, metal containers, metal stampings, or machine tools). This proposition holds even for broad production base industries with a strong residual dependence on defense procurement. For example, the adverse effect upon direct requirements for communication equipment and ships and boats under either offset considered is significantly diminished in one industry and leads to an expansion in output in the other with no significant variation recorded for policy choice.

The majority of industries with diversified production bases are neutral with respect to shifts in the composition of direct requirements. Industries that are oriented toward defense or are directly affected by the offset considered are sensitive to policy adjustments. For example, the decrease in aircraft and parts is minimized by increased expenditures for space assumed in the public offset but still records an eighteen per cent reduction in total capacity. The importance of the production base is evident when comparing the variation in impact between the aircraft industry and the ships and boats industry.

The five industries classified in the narrow production base category potentially represent the most volatile group with respect to shifts in the composition of demand. However, these industries show very little direct dependence on military procurement and hence display no adverse effects. On the other hand, the dependence on direct requirements is particularly evident when considering the expansion of output accompanying the private policy offset.

In general the results of the computations show that the shift from defense to nondefense expenditures has an expansionary impact on the majority of industries. The derived relationships appear to provide evidence for the argument advanced by Professor Fishman, concerning the expansionary impact of shifting defense expenditures.⁹

⁸ In the technical sense an industry may ship nothing to final demand and yet have a very narrow production base, i.e., copper ore, and iron ore. These industries ship virtually all of their output to one or two other intermediate producing industries and have been eliminated from consideration in the 66 order enumeration based on the principle that two industries may be aggregated if one consumes substantially all of the output of the other.

⁹ See Leslie Fishman, "The Expansionary Effects of Shifts From Defense to Nondefense Expenditures," in *Disarmament and the Economy*, pp. 173-181, and more rigorously discussed in "A Note on Disarmament and Effective Demand," *Journal of Political Economy*, vol. LXX, No. 2 (April 1962), pp. 183-186.

TABLE III.—*Relationship of disarmament alternatives to armed economy*

[Expressed as ratios]

Industry classification	Ratio of direct private offset to direct armed	Ratio of direct public offset to direct armed	Ratio of direct armed to direct and indirect armed	Ratio of direct private offset to direct and indirect armed	Ratio of direct public offset to direct and indirect armed	Ratio of direct and indirect private offset to direct and indirect armed	Ratio of direct and indirect public offset to direct and indirect armed
Livestock and poultry	1.01	1.00	0.49	0.50	0.49	1.02	1.00
Grain and feed crops	.99	1.00	.07	.13	.07	1.13	1.01
Food products	.98	1.00	.65	.64	.65	.99	1.00
Tobacco manufacturers	1.00	1.00	.34	.34	.34	1.02	1.01
Alcoholic beverages	1.01	1.00	.26	.26	.26	1.03	1.01
Cotton synthetics	1.03	1.00	.32	.32	.32	1.03	1.00
Apparel	1.02	1.01	.54	.55	.54	1.02	1.01
Leather and leather products	1.04	1.01	.34	.36	.34	1.04	1.01
Plastics	.98	.95	.07	.07	.07	1.02	.98
Logging, sawmills	1.02	1.02	.53	.54	.54	1.03	1.02
Pulp, paper and products	1.00	1.08	.17	.17	.18	1.02	1.03
Industrial inorganic chemicals	.99	1.40	.16	.16	.22	1.01	1.09
Industrial organic chemicals	1.03	1.03	.02	.02	.02	1.02	1.02
Miscellaneous chemicals and paint	1.03	1.03	.24	.25	.25	1.03	1.01
Drugs and medicines	1.04	1.02	.38	.39	.38	1.03	1.01
Rubber and rubber products	1.03	1.03	.14	.14	.14	1.03	.98
Nonmetallic minerals	1.00	1.06	.46	.46	.40	1.01	1.04
Petroleum and petroleum products	.97	.99	.49	.48	.40	.98	.99
Coal	1.03	1.00	.40	.42	.44	1.02	1.05
Coke and products	1.04	1.10	.06	.06	.07	1.01	1.04
Iron and steel	.96	1.05	.14	.14	.15	1.00	1.03
Iron and steel forging	.96	1.03	.07	.06	.07	1.01	1.02
Copper	.82	.85	.05	.04	.05	1.00	.99
Aluminum		1.06				1.03	1.06
Other nonferrous		1.04				1.02	1.01
Metal containers	.98	.90	.01	.01	.01	1.02	1.02
Cutlery tools	.99	1.02	.20	.20	.20	1.01	1.02
Plumbing and heating	1.01	1.03	.28	.28	.29	1.01	1.02
Metal stampings	.95	1.02	.09	.09	.09	1.01	1.02
Fabricated metal products	.99	1.07	.39	.39	.42	1.01	1.04
Engines and turbines	1.04	1.03	.11	.12	.12	1.00	1.02
Construction and mining equipment	1.05	1.10	.30	.32	.33	1.01	1.04
Farm and industrial tractors	1.07	1.04	.31	.33	.32	1.03	1.02
Machine tools	1.05	.99	.26	.27	.26	1.01	1.01
Industrial machinery	1.08	1.01	.54	.58	.54	1.03	1.01
Power transmission						.93	1.03
Pumps and compressors	1.05	1.05	.10	.10	.10	.98	1.02
Refrigeration equipment		1.01	.23		.23	.94	1.01

TABLE III.—*Relationship of disarmament alternatives to armed economy*—Continued

[Expressed as ratios]

Industry classification	Ratio of direct private offset to direct armed	Ratio of direct public offset to direct armed	Ratio of direct armed to direct and indirect armed	Ratio of direct private offset to direct and indirect armed	Ratio of direct public offset to direct and indirect armed	Ratio of direct and indirect private offset to direct and indirect armed	Ratio of direct and indirect public offset to direct and indirect armed
Motors and generators.....	0.94	0.90	0.14	0.13	0.12	1.01	1.00
Insulated wire and cable.....	1.05	1.05	.24	.25	.25	1.03	1.02
Electrical appliances.....	.88	1.00	.29	.26	.29	.96	1.01
Radio and related products.....	1.06	1.00	.29	.30	.29	1.04	1.01
Communication equipment.....	.89	.85	.24	.21	.20	.99	.97
Electrical equipment.....	1.08	1.00	.20	.21	.20	1.04	1.01
Motor vehicles and trailers.....	1.05	1.03	.57	.60	.59	1.04	1.03
Aircraft and parts.....	.56	.72	.61	.34	.44	.71	.82
Ships and boats.....	.74	.72	.21	.16	.15	1.11	1.10
Locomotive and railroad cars.....	1.07	1.02	.06	.07	.06	1.02	1.01
Photography equipment.....	1.32	.93	.31	.41	.29	1.12	.99
Miscellaneous manufacturing industries.....	1.00	1.02	.40	.40	.41	1.01	1.02
Electric light and power.....	.97	1.21	.55	.54	.67	1.00	1.14
Gas utilities.....		1.04	.16		.17	1.00	1.01
Railroads, trucking.....	1.03	1.05	.67	.70	.71	.99	1.04
Overseas transportation.....	1.21	.93	.09	.11	.08	1.08	1.01
Air transportation.....	1.25	1.04	.11	.14	.12	1.03	.99
Local and highway.....	.95	.99	.31	.30	.31	1.01	1.01
Trade.....	1.03	1.00	.92	.95	.92	1.03	1.00
Auto and other repair.....	1.09	1.06	.30	.32	.31	1.06	1.03
Printing and publishing.....	1.03	1.05	.47	.48	.49	1.03	1.04
Advertising.....	1.08	1.00	.09	.10	.09	1.04	1.03
Telephone and telegraph.....	1.04	1.02	.77	.79	.78	1.04	1.02
Banking, finance, and insurance.....	1.10	1.02	.77	.84	.79	1.10	1.02
Real estate and rent.....	1.08	1.00	.92	1.00	.93	1.08	1.01
Motion picture and other.....	1.05	1.00	.40	.42	.40	1.06	1.00
Service industries.....	1.05	1.01	.59	.62	.59	1.05	1.01
Medical, dental, professional.....	1.18	1.04	.72	.84	.74	1.14	1.03

Source: Table II.

IV. CONCLUSIONS AND RECOMMENDATIONS

1. CONCLUSIONS

(1) A 50-percent reduction in defense outlays, offset by compensating increases in expenditures within either the private or public sector will affect the industries producing weapons substantially, but will have little effect on supporting industries. This is true since the production bases of the supporting industries are common to other elements of final demand besides the military establishment. Furthermore, within the classification system used there is a large amount of compensation in the indirect effects, and the net result is not very startling.

(2) The magnitude of the shift in final demand postulated (approximately 5 percent of gross national product) was not large enough to pose structural problems. Granted a more detailed aggregation would have produced more dramatic variations, the significance of these variations is doubtful with respect to the magnitudes involved. To be sure, a 400 order industry aggregation would have revealed and identified substantive impacts. But from the pattern of results shown in the 66 order aggregation, it was reasoned that further impacts would occur only in supporting industries closely allied to the aircraft and electronics industries.

(3) The derivation of the indirect pattern of demand shows that the economy is heavily consumer oriented. Indeed, this dependence is so strong that substantial shifts between other categories of final demand are dampened considerably.

(4) Industry sensitivity to variations in final demand patterns is diminished markedly by the pattern of accompanying intermediate demands.

(5) The effect of public policy is not significant to the output levels of industries supporting the military oriented industries. Furthermore, if expenditures for space are treated as defense outlays, it is doubtful whether policy variations have any effect.

2. RECOMMENDATIONS

The most important consideration in determining the impact on the economy of a large reduction in defense outlays is concealed in the assumptions made for the model. These relate to how the postulated compensating changes in demand will be initiated. The detail which would be made available by highly disaggregated regional input-output models would be a tremendous aid to the analysis of how aggregate demand could be maintained.

The leverage effects on investment of shifts in final demand would be of urgent importance in analyzing the effects on aggregate demand of given shifts in final demand. Very detailed product models on a regional basis, together with adequate measures of existing plant capacities, would afford a means of estimating the relative investment needs for different programs. It would also provide much needed information on potential imbalances in production that might then be corrected before becoming bottlenecks to a rapid shifting of production.

The time-phasing of the transition and the time scheduling of the detailed impacts is of course a very important determinant of the efficiency of the transition. Here again the detailed flows are necessary for analysis since averages are not very useful for this purpose.

It is in this respect that the strongest recommendation for future research in the application of input-output analysis to the economics of disarmament concerns the design and implementation of time-phased regional models.

SUMMARY

To investigate some of the major structural problems which might arise from disarmament, an input-output model was constructed specifying three full-employment patterns of end product deliveries which might reasonably be expected for the year 1970. The purpose of the model was to measure the impact of varying compositions of final demand accompanying a reduction in defense expenditures on the production capabilities of 66 processing sectors. Each disarmament pattern was stipulated with respect to a specific level and composition of defense expenditures in conjunction with a compensating policy offset.

The relative impact on total industry requirements was discerned by comparing the derived output levels of each industry under the alternative policy formulations. An analysis of the computational results lead to the following five major conclusions:

1. A 50 percent reduction in defense outlays, offset by compensating increase in expenditures within either the private or public sector, will affect the industries producing weapons substantially but will have little effect on supporting industries.

2. The magnitude of the shift in final demand postulated was not large enough to pose structural problems.

3. The derivation of the indirect requirements indicated that the processing sectors are quite consumer oriented. Indeed, this dependence was so strong that substantial shifts between other major categories of final demand were dampened considerably.

4. Industry sensitivity to variations in final demand patterns was diminished markedly by the pattern of accompanying intermediate demands.

5. The effect of public policy was not significant to the output levels of industries supporting the military oriented industries.

ZUSAMMENFASSUNG

Der vorliegende Artikel behandelt an Hand eines Input-Output Modells die wichtigsten Strukturprobleme, die sich im Zuge der militärischen Abrüstung ergeben können. Das Modell bezieht sich—unter der Annahme der Vollbeschäftigung—auf drei verschiedene hypothetische Niveaus der Produktion von Endprodukten im Jahre 1970; es soll die Auswirkungen der als Folge der Abrüstung variierenden Endnachfrage in 66 verarbeitenden Sektoren untersuchen. Jedem "Abrüstungsniveau" entspricht eine bestimmte Höhe und eine bestimmte Struktur der Verteidigungsausgaben in Verbindung mit einer entsprechenden Politik.

Ein Vergleich der so abgeleiteten Output-Niveaus jeder Industrie bei alternativen verteidigungspolitischen Verhaltensweisen ermöglicht es, die relativen Auswirkungen auf die gesamte Industrie aufzuzeigen. Im einzelnen lassen sich daraus fünf Schlüsse ziehen:

1. Durch eine fünfzigprozentige Reduktion der Verteidigungsausgaben werden zwar die eigentlichen Rüstungsindustrien relativ schwer betroffen; sofern die Reduktion aber durch eine entsprechende Ausweitung des öffentlichen oder privaten Konsums kompensiert wird, ergeben sich auf die vorgelagerten Sektoren nur geringe Auswirkungen.

2. Die erhaltenen Verschiebungen der Endnachfrage sind nicht gross genug, um strukturelle Probleme hervorzurufen.

3. Die untersuchten Branchen sind überwiegend konsumorientiert; diese Abhängigkeit vom Konsum ist so ausgeprägt, dass Verschiebungen bei anderen Nachfragekategorien dadurch nicht ins Gewicht fallen.

4. Die Reaktionen der Industrie auf die Änderungen der Endnachfrage werden durch die parallele Nachfrage nach Zwischenprodukten bedeutend gedämpft.

5. Die öffentliche Politik hat kaum signifikante Auswirkungen auf die Output-Niveaus der die Rüstungsindustrien geliefernden Branchen.

RÉSUMÉ

Cet article traite à l'aide d'un modèle Input-Output les problèmes structurels principaux pouvant résulter du désarmement. Le modèle, en supposant le plein-emploi, se réfère à trois structures hypothétiques différentes de production finale pour l'année 1970. Il veut mesurer les répercussions de la demande finale, qui à la suite du désarmement a varié, dans soixante-six secteurs de fabrication. A chaque niveau de désarmement correspond un degré et une structure spécifiques des contributions à la défense en relation avec une politique correspondante de compensation.

L'influence des différentes politiques de défense sur la production industrielle était dérivée d'une comparaison des niveaux de production alternatifs de chaque secteur. On peut en tirer cinq conclusions:

1. Une réduction de cinquante pour cent des dépenses pour la défense affectera les industries d'armement assez gravement; mais si la réduction peut être compensée par une expansion équivalente de la consommation publique ou privée, les répercussions pour les secteurs précédents seront faibles.

2. Les modifications obtenues de la demande finale sont trop faibles pour pouvoir poser des problèmes structurels.

3. Les secteurs analysés produisent principalement des biens de consommation; cette dépendance est si grande, que les déplacements entre les autres catégories de demande ont peu d'importance.

4. Les réactions de l'industrie sur les modifications de la demande finale sont amorties par la demande parallèle de produits intermédiaires.

5. La politique a peu d'effet sur les niveaux d'Output des branches approvisionnant les industries d'armement.

ECONOMIC IMPACT ANALYSIS: A MILITARY PROCUREMENT FINAL-DEMAND VECTOR*

VOLUME I: RESULTS AND METHODOLOGY

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE,
Washington, D.C., January 27, 1967.

DEAR SIR: The enclosed study, "Economic Impact Analysis: A Military Procurement Final Demand Vector, Volume I," is the first of two volumes prepared by the Research Analysis Corp. under contract with the Department of Defense.

These two volumes present the methodology and results of a study which provides, for the first time, an interface between DOD data systems and 4-digit Standard Industrial Classifications (SIC). Specifically, they provide a statement of military procurement requirements (bill of goods) in terms that are compatible with interindustry economic models and the national income accounting concepts used in these models. Volume I presents estimates developed for 1963; volume II will present an analysis of the detailed results.

Your comments and suggestions on this exploratory research effort are invited.

Sincerely,

VERNON M. BUEHLER,
Colonel, U.S. Army.

FOREWORD

This memorandum reports on research performed in 1966 by RAC's Economic Impact Group for the Office of the Assistant Secretary of Defense for Systems Analysis. The Economic Impact Group under the direction of Donald J. Igo is continuing both the refinement of methods and the development of impact estimates for the Office of the Secretary of Defense, the Bureau of Labor Statistics, the Office of Emergency Planning, and the Arms Control and Disarmament Agency.

Volume I presents a military procurement final-demand vector, or "bill of goods," developed for applications in interindustry studies of the US economy. Volume II presents a comparison of RAC results with estimates derived by other estimating techniques, discusses some of the methodological problems involved in developing final-demand estimates, and indicates directions for future research.

Earlier publications of the Economic Impact Group are "A Case Study in Industry Impact Patterns: The F-4 Aircraft," RAC-T-451, January 1965; "Methodology for Industry Impact Analysis," RAC-TP-190, volume I, "Methodology and Summary Results," March 1966, and volume II, "Procurement Documentation," July 1966 (Secret); and "Industrial Classification and Economic Impact Analysis," RAC-TP-207, May 1966.

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Head, Economics and Costing Department.

*Economics and Costing Department, Technical Paper RAC-TP-248, published March 1967, by Research Analysis Corp., McLean, Va; Donald J. Igo, Irving Moder, Elwyn M. Bull, William Lindsay, Jr. and Ken R. Gramza.

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ABBREVIATIONS

AFLC	Air Force Logistics Command.
AGE	Aerospace ground equipment.
AMP	Army materiel plan.
A&OGFAE	Armament and other government-furnished aerospace equipment.
ASD(C)	Assistant Secretary of Defense (Comptroller).
CFE	Contractor-furnished equipment.
DOD	Department of Defense.
E&C	Electronics and communications.
FSC	Federal supply classification.
FY	Fiscal year.
FYFSFP	5-year force structure and financial program.
GFE	Government-furnished equipment.
GFM	Government-furnished materiel.
GNP	Gross national product.
GSE	Ground support equipment.
ICBM	Intercontinental ballistic missile.
n.e.c.	Not elsewhere classified.
OASD	Office of Assistant Secretary of Defense.
OBE	Office of Business Economics.
OEP	Office of Emergency Planning.
OPN	Other procurement, Navy.
OSD	Office of Secretary of Defense.
PAMN	Procurement of aircraft and missiles, Navy.
PEMA	Procurement of equipment and missiles, Army.
PMC	Procurement, Marine Corps.
R&D	Research and development.
RDTE	Research, development, test, and evaluation.
SCN	Shipbuilding and conversion, Navy.
SIC	Standard industrial classification.
TOA	Total obligatory authority.

INTRODUCTION

BACKGROUND OF ECONOMIC IMPACT STUDIES

This report presents a military procurement final-demand vector, or "bill of goods," developed by RAC for applications in interindustry studies of the US economy. The military bill of goods in an interindustry economic model is a statement of military requirements for material and services from the civilian economy in terms that are compatible with the industry definitions in the model. This introductory section discusses the background of the RAC economic impact project and describes the general characteristics of interindustry analysis and some of the uses for which the final-demand vector is intended. The major portion of this volume presents the final-demand estimates and methodology. A second volume will (a) present a comparison of the RAC results with estimates based on other sources of Department of Defense (DOD) procurement data; (b) discuss some of the methodological problems involved in deriving military final-demand estimates; and (c) indicate directions for future research.

Origin of economic impact studies

In a memorandum dated December 21, 1963, to heads of departments and agencies primarily concerned with national security and economic affairs, President Johnson directed the formation of a committee on the economic impact of defense and disarmament. In this memorandum the President stated:

It is therefore important that we improve our knowledge of the economic impacts of [defense] spending, so that appropriate actions can be taken * * * to minimize potential disturbances which may arise from changes in the level and pattern of defense outlays.

On March 31, 1964, Secretary of Defense Robert S. McNamara issued a memorandum to the heads of the military departments, initiating studies designed to measure the impact of current and future defense programs on US industries and geographic areas. A committee composed of representatives of each Service Secretary and chaired by the Assistant Secretary of Defense (Comptroller) [ASD(C)], was organized within DOD to monitor the economic impact studies. Financial contribution and representatives to the monitor group were also provided by the Arms Control and Disarmament Agency. Shortly after the committee was organized, RAC was asked to participate in the study program.

RAC economic impact project

The first task undertaken by RAC was the development of a methodology to quickly produce estimates of economic impact of the current 5-year program, i.e., rough approximations of the value added and employment that would be generated. This "rough-cut" approach was designed to provide DOD the first relatively complete picture of the economic impact of the 5-year force structure and financial program (FYFSFP). The research was organized in terms of appropriation categories. In the procurement category, to which primary attention was devoted, specialized military end-items were divided into major classes, and representative items or prototypes from each class were selected and studied, utilizing DOD component

information and contract sources. Information was sought that would allow the measurement of in-house effort by contractors in order to approximate value-added distributions. Generally the tracing efforts permitted identification of second- and third-tier suppliers of prime contractors responsible for the delivery of major end-items such as aircraft, missiles, ships, and tanks. Analyses of impact of the other appropriation categories (e.g., RDTE, military personnel, operations and maintenance) were also conducted. The completed estimates were transmitted to OASD(C); methodology and summary results were presented in a two-volume RAC publication.¹

With this work completed, the Office of Secretary of Defense (OSD)* requested that RAC integrate its efforts with interindustry economic research being performed by the interagency Growth Studies Project (whose central staff is in the Bureau of Labor Statistics), the Office of Business Economics (OBE), Department of Commerce, and the Office of Emergency Planning (OEP), Executive Office of the President.

A requirement for estimates of military final demand for use in interindustry (input-output) models of the U.S. economy was accorded high priority by representatives of these agencies. The need for military final-demand estimates had also been cited by the President's Committee on the Economic impact of Defense and Disarmament.² The Committee identified the lack of such estimates as one of seven major gaps in impact information and recommended research to overcome this deficiency.

Because previous RAC work on stratification of procurement funding had provided the required data base, RAC was requested by OSD to develop estimates for the procurement portion of DOD final demand. RAC also provided preliminary bill-of-goods distributions—based on previous economic impact work for OSD—for the operations and maintenance, military personnel, and RDTE appropriations to be used in conjunction with other data in developing the complete military final-demand vector, but primary responsibility for estimates in these appropriation areas was assumed by the agencies involved in interindustry studies. Brief discussions of the interindustry economic models in which the final-demand estimates will be used and the programs of the agencies for which the final demand estimates were developed are presented in the following paragraphs.

INTERINDUSTRY ECONOMIC MODELS

The basis of interindustry analysis is the input-output table, which describes in quantitative terms the interdependencies existing among industries in the U.S. economy. The table shows how the output of each industry is distributed among other industries and sectors of the economy; at the same time it shows the inputs to each industry from other industries and sectors. The final-demand sector of the table represents expenditures by which goods and services are acquired for final use by consumers and the Government and for investment and exports. In the input-output tables, final-demand estimates are grouped to indicate where they originate (e.g., households, Federal Government, State and local government) and the industries on which they fall.

* Responsibility for OSD economic-impact studies was transferred from ASD(C) to ASD systems analysis (economics) in November 1965.

Using interindustry computational techniques, a hypothetical or projected final demand can be translated into total output requirements for each industry in the model. A given industry's total output includes not only output in direct response to final demand, but also output required as a consequence of final demand on other industries to which the given industry supplies inputs, and of final demand on still other industries to which its customers deliver inputs.³

In the U.S. economy many industries deliver a large proportion of their output not to final users but to other industries. For example, in order to determine how much the demand for bauxite would increase if the Air Force increased its purchases of military aircraft by a given amount, one must determine how much ore the nonferrous metals industry requires for producing primary aluminum; how much primary aluminum is used in producing a given amount of aluminum plate, sheet, wire, and other fabricated products; and how much of the fabricated products is used in production of military aircraft. The interindustry relations incorporated in the processing sector of the input-output table permit the tracing of such indirect effects of changes in final demand for end products.

In late 1964 OBE published an interindustry table of the U.S. economy based on 1958 data. This table breaks down the economy into 81 industries or functional economic sectors. The 1958 interindustry table was constructed as a complement of the national income and product accounts published by the Department of Commerce, so that the measurement of total final demand (or gross national product) and of the flows to each final market is the same in the two sets of accounts.⁴ Preparation of an input-output table based on 1963 data, showing considerably more industry detail than the 1958 model, has been under way since 1965.

The industry sectors in the interindustry tables are defined in terms of the standard industrial classification (SIC) system, which was developed under the supervision of the U.S. Bureau of the Budget, and to which all government agencies are expected to conform in gathering and publishing economic statistics. The SIC industrial structure defines a system of four-digit industry codes of which the first two digits represent a "major group" and the first three digits a "group." For example, in the manufacturing industries, two-digit major group 37 is transportation equipment, three-digit group 372 is aircraft and parts, and four-digit industry 3722 is aircraft engines and engine parts. The entire system is divided into 10 divisions representing general areas of economic activity, e.g., agriculture, mining, manufacturing.

In classifying products the Bureau of the Census extends the four-digit SIC industry classification. Beyond the first four digits the Bureau of the Census defines a five-digit product class plus unique sixth and seventh digits. Thus a seven-digit product code carries within its numbering structure the product class, industry, group, and major group of which it is a part, i.e., in which it is a primary product. A list of SIC census manufactured products was made up for use in the 1939 Census of Manufactures, and these lists have been expanded and revised for each census thereafter. The current list, "Numerical List of Manufactured Products, 1963 Census of Manufactures,"⁵ includes approximately 7,500 seven-digit product codes, 1,130 five-digit product classes, and 425 four-digit industries.

Applications of interindustry analysis

Interindustry analysis is being used in a wide range of applications, including evaluation of the effects of long-range government programs (e.g., public works, farm programs, defense expenditures, space, and urban renewal) on the rest of the economy.⁶ The effects of both increases and decreases in defense programs are being analyzed. For example, in the case of industrial mobilization the competing demands generated by a military buildup may be traced through the intricate network of the economy by use of interindustry models, and determination may be made of the production levels for all industries that are consistent with a given schedule of end-product deliveries. Decreases in defense expenditures may result from changes in U.S. military commitments, from changes in the product mix of defense procurement, or from implementation of international arms-control agreements. Here interindustry analysis is being used for identification of major impacts on specific industries so that policies to assist in required readjustments can be formulated and implemented. For example, projections of the demand for labor, by industry and by occupation, can be developed based on input-output analyses and used for occupational guidance and formulation of plans for long-term retraining programs.

Interagency growth study project. This project was organized to develop a comprehensive framework for analyzing the long-term implications of economic growth in a number of problem areas. The central project staff is in the Bureau of Labor Statistics Division of Economic Growth; overall coordination is provided by a committee of representatives from each participating agency (including OBE, Department of Agriculture; and Bureau of Mines, Department of the Interior) chaired by a member of the Council of Economic Advisors. Alternative projections of the U.S. economy through 1970 are being developed around the Department of Commerce Interindustry Model of the U.S. economy in 1958.⁴ Projections of interindustry relations through 1970 will reflect anticipated changes in technology and, if possible, changes in relative costs. The interindustry model will be used to convert projections of final demand to estimates of total output requirements by industry. Industry output requirements generated by the interindustry model, in conjunction with additional data, will provide a basis for projections of the demand for labor by industry and by occupation.

The growth study project will provide a capability for analyzing the implications of various policy proposals on programs that involve consideration

METHODOLOGY FOR DEVELOPMENT OF THE PROCUREMENT FINAL-DEMAND VECTOR

SUMMARY OF FINDINGS

Table 1 presents the RAC procurement bill of goods for 1963 in the form of a percentage distribution of DOD procurement by four-digit SIC⁵ product codes. The RAC results are presented in percentage terms rather than in dollars; OBE is developing in dollar terms a DOD expenditures estimate for 1963 adjusted to the national income

accounting definitions used in interindustry models. The Department of Commerce estimate will provide a control total for converting the RAC percentage distribution into a bill of goods in dollar terms, as required for interindustry model applications.*

The distribution in table 1 indicates that on the basis of first-order (prime contractor) impact the five largest codes accounted for 68 percent of total procurement, and the 15 largest codes accounted for 89 percent of the total. The largest code was 3721, aircraft, with 21 percent. SIC 3662, radio, TV communication equipment, with 20 percent, was the next largest code. Shipbuilding and repairing, SIC 3731, represented about 10 percent of DOD procurement funds, and SIC 3722, aircraft engines and parts, constituted about 9 percent. Approximately 8 percent of the total was SIC 1925, complete guided missiles, and almost 5 percent was SIC 1929, Ammunition, n.e.c.† Some 78 codes representing 97 percent of total procurement are identified in table 1. Each of the codes ranked below the 13 largest accounted for less than 1 percent of the total.

TABLE 1.—*First-order distribution of DOD procurement, by 4-digit SIC product codes*

[Fiscal year 1963 expenditure weights]

Rank	SIC code	Product	Percent	Cumulative percent
1	3721	Aircraft.....	21.05	
2	3662	Radio, TV communication equipment.....	19.71	
3	3731	Shipbuilding and repairing.....	10.24	
4	3722	Aircraft engines and parts.....	9.22	
5	1925	Complete guided missiles.....	7.66	68
6	1929	Ammunition, n.e.c.....	4.62	
7	3729	Aircraft equipment, n.e.c.....	4.05	
8	1931	Tanks and tank components.....	2.39	
9	3717	Motor vehicles and parts.....	2.35	
10	3571	Computing and related machines.....	2.25	
11	3621	Motors and generators.....	2.15	
12	3811	Scientific instruments.....	1.18	
13	8911	Engineering and architectural services.....	1.16	
14	3541	Metal-cutting machine tools.....	1.12	
15	3443	Boiler-shop products.....	.84	
16	3661	Telephone, telegraph apparatus.....	.84	89
17	3723	Aircraft propellers and parts.....	.84	
18	3531	Construction machinery.....	.75	
19	3861	Photographic equipment.....	.71	
20	1999	Ordnance and accessories.....	.67	
21	3611	Electric measuring instruments.....	.53	92
22	1951	Small arms, 30 mm, and under.....	.48	
23	1941	Sighting and fire-control equipment.....	.47	
24	1961	Small-arms ammunition.....	.46	
25	1911	Guns, howitzers, and mortars.....	.39	
26	2892	Explosives.....	.36	
27	3511	Steam engines and turbines.....	.31	
28	3537	Industrial trucks and tractors.....	.30	
29	3545	Machine-tool accessories.....	.25	
30	3715	Truck trailers.....	.25	
	3599	Miscellaneous machinery.....	.20	96
	1511	General building contractors.....	.17	
	3613	Switchgear and switchboards.....	.17	
	3679	Electronic components, n.e.c.....	.15	
	1731	Electrical work.....	.12	
	3842	Surgical appliances and supplies.....	.09	
	3542	Metal-forming machine tools.....	.08	
	2295	Coated fabric, not rubberized.....	.08	
	3732	Boat building and repairing.....	.07	
40	3357	Nonferrous wire drawing, etc.....	.06	
	2399	Textile products, n.e.c.....	.05	
	3559	Special-industry machinery, n.e.c.....	.05	
	3536	Hoists, cranes, and monorails.....	.04	

* A preliminary control total for DOD procurement expenditures for calendar year 1963, \$15,722 million, is presented in the section on national income accounting in vol. II of this report. The derivation of control totals for subcategories of total procurement (e.g., aircraft, missiles, ships), for use with the percentage distributions by subcategory presented in this volume, is also discussed in vol. II.

† Not elsewhere classified.

TABLE 1.—*First-order distribution of DOD procurement, by 4-digit SIC product codes—Continued*

[Fiscal year 1963 expenditure weights]

Rank	SIC code	Product	Percent	Cumulative percent
50	2499	Wood products, n.e.c.	.04	
	3491	Metal barrels, drums, and pails	.04	
	3399	Chemical preparations, n.e.c.	.04	
	3446	Architectural metal works	.03	
	3501	Pumps and compressors	.03	
	3691	Storage batteries	.03	
	3642	Lighting fixtures	.02	
	3069	Rubber products, n.e.c.	.02	
	1799	Special-trade contractors, n.e.c.	.02	
	3449	Miscellaneous metal work	.02	
	3494	Valves and pipe fittings	.02	
	3461	Metal stampings	.02	
	3535	Refrigeration machinery	.02	
	2911	Petroleum refining	.01	
60	3429	Hardware, n.e.c.	.01	
	3821	Mechanical measuring devices	.01	
	2328	Work clothing	.01	
	3589	Service-industry machines, n.e.c.	.01	
	3582	Commercial laundry equipment	.01	
	3519	Internal combustion engines	.01	
	3548	Metalworking machinery, n.e.c.	.01	
	2599	Furniture and fixtures, n.e.c.	.01	
	3555	Printing trades machinery	.01	
	3564	Blowers and fans	.01	
	3622	Industrial controls	.01	
	3141	Shoes, except rubbers	.01	
	3999	Miscellaneous products, n.e.c.	.01	
	70	2394	Canvas products	(1)
3431		Metal plumbing fixtures	(1)	
3315		Steel wire drawing, etc.	(1)	
2731		Books, publishing, printing	(1)	
3079		Plastic products, n.e.c.	(1)	
3612		Transformers	(1)	
3651		Radio and TV receiving sets	(1)	
3532		Mining machinery and equipment	(1)	
		Total identified	97.41	97
		Miscellaneous	2.59	3
	Total	100.00	100	

Less than 0.005 percent.

GENERAL METHODOLOGY

The goal of the analysis was the development of a statement of military procurement requirements for materiel and services for use in interindustry models. To achieve compatibility with the sector definitions used in current interindustry models, procurement requirements as stated in DOD programming and budgetary documents had to be reclassified to SIC terms. A substantial data-collection effort was necessary to obtain the procurement detail required for this reclassification. At the request of the user agencies, military final demand was defined as direct procurement by the government, and, to the extent possible, data permitting identification of the interface between government and the private economy were obtained. However, in the case of industrially funded activities such as government-owned and operated shipyards and arsenals the RAC distribution reflects the end-item procured by the relevant appropriation account from the government plant (e.g., ships, ammunition) rather than the shipyards' and arsenals' purchases of raw materials, intermediate products, and services from the private economy. Since time and resources were not available for identification of the activities of

these government plants, it was assumed that the purchases of these plants from the economy could be approximated by those of counterpart private plants; the private-plant purchase patterns are embodied in the processing sectors of interindustry models.

Major category composition

The first step in the development of the SIC distribution was the division of total DOD procurement into six major categories: Aircraft, ships, missiles, electronics and communications, ammunition, and weapons, vehicles and other. Table 2^{8,9} presents the composition of the six major categories, by appropriation title and budget activity code.⁸ Each budget activity (in some cases aggregations of budget activities were studied) was then analyzed to determine its first-order product composition. For example, the missiles category shown in table 2 is composed of a number of budget activities for each military service. For the Marine Corps it is the "Procurement, Marine Corps (PMC)" appropriation, budget activity 2, guided missiles and equipment. The SIC percentage distribution of the dollar total for that activity is shown in the accompanying tabulation:

	SIC	Percent
1925 Complete guided missiles.....		51
3662 Radio, TV communications equipment.....		22
3722 Aircraft engines and parts.....		17
3729 Aircraft equipment, n.e.c.....		10
Total.....		100

The percentage distributions for each code were then aggregated, using fiscal year 1963 expenditures as weights,* into a total bill of goods for all services and categories to construct the distribution for DOD shown in table 1.

The primary sources of data were the Army,¹⁰ Navy,⁹ and Air Force^{11,12} procurement lists submitted by the military departments to OSD as part of the FYFSFP. The line items in these procurement lists display considerable diversity with respect to levels of aggregation; for example, one line item such as missile modifications may represent a multimillion-dollar aggregation of products and services covering many SIC codes; in other areas a line item may be as detailed as "Truck, forklift, gasoline-engine driven, 4,000 pounds, 144-inch lift." Further product detail breakdown was based on DOD budgetary, programing, and systems-management data for all procurement-list line items representing aggregations of products (more than one four-digit SIC code). The detailed sources used for this disaggregation are cited in the following sections.

*The fiscal year 1963 expenditures data by budget activity code were developed from DOD budgetary sources by the Bureau of Labor Statistics, Division of Economic Growth, and represent expenditures in DOD accounting terms. They are not adjusted to national income accounting concepts. Although the Department of Commerce model is for calendar 1963, calendar year weights were not available, and fiscal 1963 data had to be used in weighting the distributions.

TABLE 2.—Procurement categories, by appropriation title and budget activity class ¹

RAC category: Aircraft		RAC category: Missiles		RAC category: Ships	
Appropriation title	Budget activity	Appropriation title	Budget activity	Appropriation title	Budget activity
AIR FORCE					
Aircraft procurement.	1. Combat aircraft 2. Airlift aircraft 3. Trainer aircraft 4. Other aircraft 5. Modification of inservice aircraft 6. Spares and repair parts 7. Other support	Missile procurement.	1. Ballistic missiles 2. Other missiles 3. Modification of inservice missiles 4. Spares and repair parts 5. Other support	Not available....	Not available
NAVY AND MARINE CORPS					
PAMN.....	1. Combat aircraft 2. Airlift aircraft 3. Trainer aircraft 4. Other aircraft 5. Modification of aircraft 6. Aircraft spares and repair parts 7. Aircraft support equipment and facilities	PAMN.....	8. Ballistic missiles 9. Other missiles 10. Modification of missiles 11. Missile spares and repair parts 12. Other support equipment and facilities	SCN.....	1. Polaris ships 2. Other warships 3. Amphibious ships 4. Mine, warfare, and patrol ships 5. Auxiliaries and craft
OPN.....	3.—1940 aircraft support equipment	PMC.....	2. Guided missiles and equipment	OPN.....	1. Ships support equipment 2.—1960 Polaris support equipment
ARMY					
PEMA.....	1. Aircraft 2. Aircraft spares and repair parts	PEMA.....	3. Missiles 4. Missile spares and repair parts		

RAC category: Electronics		RAC category: Ammunition		RAC category: Weapons, vehicles, and other support	
Appropriation title	Budget activity	Appropriation title	Budget activity	Appropriation title	Budget activity
AIR FORCE					
Other procurement	3. Electronics and telecommunications equipment —Crypto and SIGINT equipment —Electronics and telecommunications modifications	Other procurement	1. Munitions and associated equipment	Other procurement	2. Vehicular equipment 4. Other base maintenance and support equipment —Industrial facilities
NAVY AND MARINE CORPS					
OPN.....	2. Communications and electronic equipment 3.—1930 Ground electronics 6.—2210 Equipment, personnel support	OPN.....	3.—1910 Expendable ordnance 3.—1920 Ordnance equipment	OPN.....	3.—1950 Other support equipment 4. Civil engineering support equipment 5. Supply support equipment 6.—1110 Equipment, command support
PMC.....	3. Communications and electronics equipment	PMC.....	1.A—Ammunition	PMC.....	1. B Artillery 1. C Weapons 1. D Combat vehicles 4. Support vehicles 5. Engineer and other equipment
ARMY					
PEMA.....	7. Communications and electronics equipment	PEMA.....	9. Ammunition	PEMA.....	5. Weapons and combat vehicles 6. Tactical and support vehicles 8. Other support equipment 10. Production-base support

¹ The appropriation titles and budget activity codes shown in the tables are defined in the Budget of the United States, 1966—Appendix (see footnote 8 at end of section). In the case of Navy activities, the 4-digit numbers following the budget code numbers

represent further subdivisions of the activity codes, as shown in Navy procurement lists (see footnote 9 at end of section).

Product-code assignments

As indicated earlier, the goal was to identify and assign SIC codes to products directly procured by DOD. For example, if a private shipyard responsible for basic construction and integration of equipment into a destroyer escort were to purchase a generator for installation in the ship, the generator would not be separately identified. Its value would be included in the funding coded to SIC 3731, shipbuilding and repairing. If, however, the Navy procured the generator and furnished it to the private shipyard for installation the value of the generator would be coded to SIC 3621, motors and generators. Since the procurement lists used as primary sources usually did not identify items to be supplied as government-furnished equipment (GFE) additional DOD data had to be obtained before first-order SIC product distributions could be developed.

Much of the data-collection effort required for deriving the military bill of goods was performed in the course of an earlier project concerning selection of representative procurement items for tracing industry impact at second, third, and lower tier levels of contracting. Since the earlier project was directed toward analysis of the impact of DOD procurement projections for the 1965-70 time period, the data available for the bill-of-goods distribution were primarily for fiscal year 1965 and later years, although in some cases fiscal year 1963 and fiscal year 1964 data had been obtained. Because of the time and manpower requirements involved in retracing data collection to provide complete coverage for 1963, the sponsor requested that data already available be utilized. The percentage distributions by budget codes were derived from analyses of DOD procurement data primarily for the fiscal year 1963 to fiscal year 1965 time period. It was necessary to use total obligational authority (TOA) data to obtain the detail needed for these percentage distributions. For combining the separate SIC distributions by budget activity code, weights based on expenditures for fiscal year 1963 were used, since expenditures more closely approximate measures of activity used in interindustry applications than obligations do.

A discussion of the stability of the product distribution of DOD procurement over time and the applicability of the RAC distribution for 1963 to DOD procurement for other years is contained in volume II of this report.

DEVELOPMENT OF THE PROCUREMENT FINAL-DEMAND VECTOR

DOD AIRCRAFT PROCUREMENT

Summary of findings

DOD aircraft procurement involved 67 SIC four-digit codes. Table 3 presents the complete listing of the identified codes and the percentage of aircraft procurement attributed to them. Four of the codes accounted for more than 80 percent of the total; no other product code accounted for as much as 3 percent of the TOA.

TABLE 3.—First-order distribution of DOD aircraft procurement, by 4-digit SIC product code

SIC	Product	Percent of procurement
3721	Aircraft	54.06
3722	Aircraft engines and parts	13.07
3662	Radio, TV communication equipment	8.64
3729	Aircraft equipment, n.e.c.	6.11
3811	Scientific instruments	2.49
3723	Aircraft propellers and parts	2.11
3571	Computing and related machines	2.03
3621	Motors and generators	1.65
8911	Engineering and architectural services	1.63
1951	Small arms, 30 mm and under	1.31
3537	Industrial trucks and tractors	.73
3611	Electric measuring instruments	.66
3599	Miscellaneous machinery	.59
1999	Ordnance and accessories, n.e.c.	.57
3861	Photographic equipment	.55
3821	Mechanical measuring devices	.42
3541	Metal-cutting machine tools	.37
3569	General industry machines, n.e.c.	.31
3613	Switchgear and switchboards	.27
3717	Motor vehicles and parts	.25
3612	Transformers	.24
3651	Radio and TV receiving set	.21
1941	Sighting and fire-control equipment	.17
3679	Electronic components, n.e.c.	.15
1511	General building contractors	.13
3531	Construction machinery	.13
3429	Hardware, n.e.c.	.10
3629	Electric industrial goods, n.e.c.	.10
2295	Coated fabric, not rubberized	.09
3561	Pumps and compressors	.09
3536	Hoists, cranes, and monorails	.08
3715	Truck trailers	.08
3696	X-ray apparatus and tubes	.07
1731	Electrical work	.06
3443	Boiler-shop products	.06
3642	Lighting fixtures	.06
3871	Watches and clocks	.05
2399	Textile products, n.e.c.	.04
2499	Wood products, n.e.c.	.04
3494	Valves and pipe fittings	.04
3542	Metal-forming machine tools	.04
3585	Refrigeration machinery	.04
2731	Books, publishing, printing	.02
3011	Tires and inner tubes	.02
3694	Engine electrical equipment	.02
3821	Optical instruments and lenses	.02
1799	Special-trade contractors, n.e.c.	.01
2599	Furniture and fixtures, n.e.c.	.01
3099	Rubber products, n.e.c.	.01
3449	Miscellaneous metal work	.01
3491	Metal stampings	.01
3511	Steam engines and turbines	.01
3545	Machine-tool accessories	.01
3566	Power-transmission equipment	.01
3622	Industrial controls	.01
3643	Current-carrying devices	.01
3691	Storage batteries	.01
3731	Shipbuilding and repairing	.01
1929	Ammunition, n.e.c.	.01
2241	Narrow-fabric mills	.01
2392	Housefurnishings, n.e.c.	.01
2851	Paints and enamels	.01
3499	Fabricated metal products, n.e.c.	.01
3564	Blowers and fans	.01
3661	Telephone, telegraph apparatus	.01
3841	Surgical and medical instruments	.01
3999	Miscellaneous products, n.e.c.	.01
	First destination transportation	.01
	Total	100.00

0000000000

1 Less than 0.005 percent.

Definition of aircraft procurement

The aircraft and associated equipment procurement funds covered in the analysis are shown in table 4. As indicated in the table, funds from Air Force, Navy, and Army appropriations for relevant budget activities were included. For analysis of product composition, however, the total aircraft and associated equipment funds were categorized as follows: Weapon systems costs, spares and repair parts, modifications of inservice aircraft, and other. (See table 5.)

TABLE 4.—*Appropriations and budget activity classes included in aircraft procurement*

Department	Appropriation title	Budget activity
Air Force	Aircraft procurement	<ol style="list-style-type: none"> 1. Combat aircraft. 2. Airlift aircraft. 3. Trainer aircraft. 4. Other aircraft. 5. Modifications of inservice aircraft. 6. Spares and repair parts. 7. Other support.
Navy	Procurement of aircraft and missiles, Navy (PAMN).	<ol style="list-style-type: none"> 1. Combat aircraft. 2. Airlift aircraft. 3. Trainer aircraft. 4. Other aircraft. 5. Modification of aircraft. 6. Spares and repair parts. 7. Support equipment and facilities.
Army	Other procurement, Navy (OPN). Procurement of equipment and missiles, Army (PEMA).	<ol style="list-style-type: none"> 1. 1940 aircraft support equipment. 1. Aircraft. 2. Aircraft spares and repair parts.

Methodology

The general methodology used to estimate the first-order impact consisted of determining and assigning SIC codes to the products directly procured by DOD. It was necessary to determine whether items were to be contractor-furnished equipment (CFE) or government-furnished equipment (GFE) before the first-order product distribution could be developed. There were, however, exceptions to this procedure. Certain auxiliary items being supplied by prime contractors were identified in the data sources and assigned product codes relevant to the items. Examples of such items are to be found in the category "Peculiar Ground Support Equipment." These items, required to make an aircraft subsystem or end-item of equipment operational in its own environment, are usually supplied by the airframe prime contractor.

The necessary data collection began with the Air Force, Navy, and Army procurement lists authorized by the Military Departments to OSD as part of the FYFSP.^{9,10,11} These lists showed the service distribution of the fiscal year 1964 aircraft TOA as follows: Air Force, 56 percent; Navy, 35 percent; and Army, 9 percent.

The line items relating to aircraft and associated equipment in these procurement lists are highly aggregative. For example, a line item such as Spares and repair parts may represent a multimillion-dollar aggregation of products covering many SIC codes. Consequently the data from these sources were used primarily to establish control totals, and further product detail breakdown was attempted wherever necessary.

The procurement lists' line items were categorized as shown in table 5. SIC distributions were derived for these categories, and when they were weighted by the appropriate values as shown in table 5 the distribution shown in table 3 resulted.

TABLE 5.—*Categorization of Aircraft Procurement TOA for Analysis of Product Composition*

Category	Percentage of DOD aircraft procurement TOA, fiscal year 1964
Weapon system costs (or aircraft program costs)	58.71
Spares and repair parts	19.99
Modifications of inservice aircraft	14.06
Other	¹ 7.24
Aircraft support equipment (OPN3—1940)	2.97
Component improvement	1.19
Common aerospace ground equipment .....	.93
Other production charges .....	.92
Industrial facilities .....	.67
Avionic/armament support equipment .....	.20
War consumables .....	.15
Miscellaneous .....	.20
First destination transportation .....	.01
Total	100.00

¹ Sum of remaining percentages.

Weapon system costs. The service distribution of the 58.71 percent of aircraft procurement TOA covered by the aircraft program cost was Air Force, 31.91 percent; Navy, 20.60 percent; and Army, 6.20 percent.

Weapon system costs consist of all procurement TOA associated with the procurement of specific aircraft. As defined in the Air Force "Program Data and Cost Detail,"¹³ aircraft weapon system cost consists of the gross flyaway and peculiar support costs associated with each type of aircraft. The government, however, does not contract with a single company for the complete weapon system. The usual procedure is to issue separate contracts for major items and to have the airframe producer integrate and assemble the items into a completed aircraft. Consequently, Weapon system cannot be product-coded per se. It was necessary to disaggregate this category into the items being procured by the government before product codes could be assigned.

The subdivisions given in table 6, obtained from budget backup exhibits,¹⁴⁻¹⁶ represent the first stage in the disaggregation of the aircraft program cost.

The airframe subcategory covers the activities of the prime integrating contractor, i.e., the production of the airframe and the integration of airframe and equipment into completed aircraft. The SIC product code 3721, aircraft, was assigned to this category.

TABLE 6.—Subdivisions of aircraft weapon system costs

Subdivision	Percentage
Flyaway-----	¹ 89. 2
Airframe-----	64. 1
Engine and engine accessories-----	13. 6
Electronics and communications-----	7. 8
Armament and other government-furnished aerospace equipment (A&OGFAE)-----	3. 7
Peculiar ground support equipment (peculiar GSE)-----	5. 4
Training equipment-----	4. 6
Preproduction costs-----	. 8
Total-----	100. 0

¹ Sum of items in subdivision "Flyaway."

The additional subcategories of aircraft flyaway cost, i.e., engine and engine accessories, electronics and communications, and armament and other government-furnished aerospace equipment (A&OGFAE), are such aggregates of end-items furnished to prime aircraft integrating contractors as GFE. Examples of major end-items included under these headings are turbofan engines; gas turbine compressors and voltage regulators in engine accessories; radios, radars and navigation computer sets in electronics and communications; flight instruments, wheel and brake assemblies, and armament items in A&OGFAE. Disaggregation of these subcategories was therefore necessary to derive product-coded distributions.

The four-digit SIC-product-coded distribution for government-furnished Aircraft engines and engine accessories given in table 7 was derived from unpublished data obtained from the Department of the Navy.¹⁷ The data consisted of a list of the values of specific items being supplied as GFE for each Navy aircraft being procured with fiscal year 1965 funds. The dollar totals correspond to the totals shown in the Navy's exhibit P-5 covering fiscal year 1965 aircraft procurement issued May 20, 1964.¹⁸

TABLE 7.—Engine and engine accessories product-coded distribution

SIC	Product	Percentage
3561	Pumps and compressors-----	0. 12
3611	Electric measuring instruments-----	. 05
3612	Transformers-----	. 53
3613	Switchgear and switchboards-----	. 66
3621	Motors and generators-----	2. 99
3691	Storage batteries-----	. 04
3694	Engine electrical equipment-----	. 03
3722	Aircraft engines and parts-----	90. 60
3723	Aircraft propellers and parts-----	4. 89
8911	Engineering and architectural services-----	. 09
	Total-----	100. 00

Similar detail was not obtained for Air Force and Army aircraft. The assumption was made that the distribution obtained from the Navy data was also applicable to the other services' procurement of items in this area. Aircraft engine costs accounted for about 87 percent of the distribution obtained from the Navy data, and since such costs are undoubtedly the major cost component in this subcategory for the Air Force and the Army, it is unlikely that the use of the Navy data to represent all three services introduces any sizable distortion of

the distribution that would have been obtained if data for all three services had been available.

Tables 8 and 9 present the 4-digit SIC-product-coded distributions for Aircraft electronics and communications GFE and for aircraft A&OGFAE. These distributions were derived from unpublished data obtained from the Department of the Navy¹⁷ and the Department of the Air Force.¹⁹

TABLE 8.—*Electronics and communications product-coded distribution*

SIC	Product	Percentage
1941	Sighting and fire-control equipment.....	3.49
1999	Ordnance and accessories, n.e.c.....	2.96
3461	Metal stampings.....	.01
3571	Computing and related machines.....	12.75
3611	Electric measuring instruments.....	(1)
3621	Motors and generators.....	.01
3642	Lighting fixtures.....	.14
3651	Radio and TV receiving sets.....	.24
3661	Telephone, telegraph apparatus.....	.07
3662	Radio, TV communication equipment.....	69.97
3679	Electronic components, n.e.c.....	.17
3729	Aircraft equipment, n.e.c.....	.30
3811	Scientific instruments.....	3.04
3821	Mechanical measuring devices.....	.01
3861	Photographic equipment.....	5.24
3871	Watches and clocks.....	.21
8911	Engineering and architectural services.....	1.39
	Total.....	100.00

¹ Less than 0.005 percent.

TABLE 9.—*Armament and other government-furnished aerospace equipment product-coded distribution*

SIC	Product	Percentage
1929	Ammunition, n.e.c.....	0.07
1941	Sighting and fire-control equipment.....	.05
1951	Small arms, 33 mm and under.....	17.79
1999	Ordnance and accessories, n.e.c.....	4.42
2241	Narrow-fabric mills.....	.01
2392	Housefurnishings, n.e.c.....	.02
2399	Textile products, n.e.c.....	.59
2731	Books, publishing, printing.....	.26
2851	Paints and allied products.....	.07
3011	Tires and inner tubes.....	.29
3069	Rubber products, n.e.c.....	.12
3429	Hardware, n.e.c.....	(1)
3443	Boiler-shop products.....	(1)
3461	Metal stampings.....	.13
3493	Valves and pipe fittings.....	.56
3511	Steam engines and turbines.....	.15
3561	Pumps and compressors.....	.10
3564	Blowers and fans.....	.02
3571	Computing and related machines.....	4.31
3599	Miscellaneous machinery.....	.02
3611	Electric measuring instruments.....	.01
3612	Transformers.....	.29
3613	Switchgear and switchboards.....	.33
3621	Motors and generators.....	2.69
3629	Electric industrial goods, n.e.c.....	1.17
2642	Lighting fixtures.....	.01
3651	Radio and TV receiving sets.....	2.80
3662	Radio, TV communication equipment.....	5.10
3679	Electronic components, n.e.c.....	1.70
3722	Aircraft engines and parts.....	8.23
3723	Aircraft propellers and parts.....	2.91
3729	Aircraft equipment, n.e.c.....	9.80
3811	Scientific instruments.....	29.71
3821	Mechanical measuring devices.....	5.83
3831	Optical instruments and lenses.....	.03
3824	Surgical appliances and supplies.....	.01
3871	Watches and clocks.....	.35
3999	Miscellaneous products, n.e.c.....	.01
8911	Engineering and architectural services.....	.04
	Total.....	100.00

¹ Less than 0.005 percent.

The data obtained from both services related to fiscal year 1965 procurement funding. For the Navy the product detail obtained was similar in coverage to that of Engines and engine accessories. For the Air Force, coverage was incomplete on most of the major aircraft included in the aircraft buy shown in the Air Force procurement list.¹¹ On the average, the detail provided in the P-5 exhibit of October 1, 1965,²⁰ accounted for 55 percent of the values shown for these aircraft in the electronics and communications subcategory and 59 percent in the A&OGFAE area. The product detail provided was used to distribute the corresponding totals shown for these aircraft. Further, the P-5 totals for the few major aircraft buys for which no product detail was supplied in the Air Force procurement list were distributed by the product detail supplied for aircraft matched on the basis of similarity of mission and aircraft characteristics as described in the Air Force Weapons Dictionary.²¹

In a like fashion, Army aircraft electronics and communications and A&OGFAE P-5²² totals were distributed by using available data for Navy aircraft selected on the basis of similarity of mission and aircraft characteristics as described in the Army and Navy Weapons Dictionary.^{23, 24} The product-coded distributions derived for each service were then combined into the DOD distributions shown above, using the values shown in the P-5 exhibits as weights.

An aircraft flyaway 4-digit SIC-product-coded distribution was derived by weighting the airframe, engines and engine accessories, electronics and communication, and A&OGFAE distributions. The relative weights used for this combination were based on the values given in table 7 for these subcategories of aircraft program costs. The flyaway distribution, as will be noted, was used to distribute categories of aircraft procurement for which no product composition was obtained.

Table 10 presents the four-digit SIC-product-coded distribution for aircraft peculiar ground support equipment (GSE). Peculiar GSE, as noted previously, includes items associated with particular aircraft that are required to make the aircraft's subsystems, or end-items of equipment, operational in their own environment. The equipment, literally composed of hundreds of items for each aircraft, is in the main supplied by the aircraft's contractors.

TABLE 10.—*Peculiar ground support equipment product-coded distribution*

SIC	Product	Percentage
3429	Hardware, n.e.c.	2.60
3036	Hoists, cranes, and monorails	1.60
3537	Industrial trucks and tractors	6.05
3569	General industry machines, n.e.c.	8.20
3571	Computing and related machines	9.60
3611	Electric measuring instruments	7.45
3662	Radio, TV communication equipment	50.75
3722	Aircraft engines and parts	13.75
	Total	100.00

The basic sources for the distribution shown in table 10 were two documents listing the ground equipment requirements for the C-141A²⁵ and the F-111A.²⁶ The additional information necessary

to permit product-coding of the listed items was obtained through the local offices of the airframe prime contractors.^{27, 28} To reduce the problem to reasonable size, product information was obtained on all F-111A peculiar aerospace ground equipment (AGE) requirements whose budgetary total target price was \$150,000 or more and on all C-141A peculiar AGE requirements for which the item unit cost was \$3,000 or more and whose total cost was \$100,000 or more in fiscal year 1965 or fiscal year 1966. A rough estimate of the coverage obtained by these samples is over 80 percent of the F-111A and almost 50 percent of the C-141A peculiar AGE requirements in dollar terms as shown in the source documents.^{25, 26} The period covered by these distributions was fiscal year 1965-66 for the C-141A and all known or recommended F-111A peculiar AGE requirements as of October 1965. The two distributions were weighted equally to result in the distribution shown in table 10. The rationale for the equal weighting was the almost equal procurement funding for subsonic and supersonic aircraft in the FYFSFP.^{9, 10, 11}

Training equipment consists primarily of weapon system trainers or flight simulators, used to train flight crews, and mobile training units, used to train aircraft maintenance technicians. Preproduction costs seem to be a miscellany of advance-buy items and nonrecurring costs involved in starting up aircraft production, e.g., tooling, engineering. No usable detail could be obtained for either of these aircraft program cost subcategories. They were assumed to have the flyaway product-coded distribution.

The product-coded distribution for the weapon system cost category was obtained by weighting the product-coded distribution of the aircraft flyaway subdivision, the peculiar GSE subdivision, and the training equipment and preproduction costs subdivisions, by the values shown in table 7, subdivision of aircraft weapon system costs.

Spares and repair parts. The service distribution of 19.99 percent of aircraft procurement TOA covered by the aircraft spares and repair parts category was Air Force, 11.51 percent; Navy, 7.08 percent; and Army, 1.40 percent.

TABLE 11.—Subdivisions of aircraft spares and repair parts procurement

Subdivision	Percentage
Aircraft components	26.0
Engines	13.3
Engine components	20.0
Instruments and components	17.6
Electronics and communications components	14.6
Fire-control components	1.6
Other aircraft components	6.9
Total	100.0

Aircraft spares and repair parts consist of initial spares and replenishment spares. Initial procurement spares include spare engines and air-vehicle, peculiar AGE, and training-device spares.¹³ Replenishment spares include all items procured as follow on support but do not include engines procured only through initial procurement spares funding.

The categorization given in table 11 represents the first stage in the disaggregation of the aircraft spares and repair parts funding. The distribution was derived by combining two separate distributions, one for initial spares and the other for replenishment spares. The sources for these basic data were personnel of the Air Force Logistics Command (AFLC).²⁹ The initial-spares distribution was based on the fiscal year 1964 program and required adjusting to compensate for a disproportionate allocation to electronics and communications components in that year. The replenishment-spares distribution reflects the fiscal year 1965 program. The weights used to combine the two distributions were Air Force fiscal year 1964 program dollars for each of these categories, obtained from the same sources.

The aircraft components were coded 3729, aircraft equipment, n.e.c.; the engines 3722, aircraft engines and parts; and the fire-control components 3662, radio, TV communication equipment. Since the product detail needed to derive product-coded distributions for the remaining categories was not available, adjusted aircraft flyaway subcategory distributions were used. Thus an engine components product-coded distribution was derived from table 7, "Engine and Engine Accessories Product-Coded Distribution," by removing the allocation to engines. An electronics and communication product-coded distribution was derived from table 8, "Electronics and Communications Product-Coded Distribution," by removing the allocation to fire-control items. The remaining two spares and repair parts categories, instruments and components, and other aircraft components, were assumed to have the A&OGFAE aircraft flyaway subcategory distribution given in table 9. The distributions for the subdivisions of the aircraft spares and repair parts procurement were weighted by the values in table 11, subdivisions of aircraft spares and repair parts procurement.

Modifications of inservice aircraft. The service distribution of the 14.06 percent of aircraft procurement TOA covered by the modifications of in-service aircraft category was Air Force, 9.66 percent; Navy, 3.71 percent; and Army, 0.69 percent.

This category covers the modifications cost of inservice aircraft AGE, and training equipment and components thereof required as a result of safety of flight or aircraft configuration modifications.¹³ An unpublished Air Force budget-supporting document³⁰ supplied the fiscal year 1964 breakdown shown in the accompanying tabulation.

Item	Percent
Kits (hardware).....	45.4
Labor and materials.....	43.5
Engineering.....	8.0
Technical data.....	1.6
Related AGE procurement.....	1.5
Total.....	100.0

No information was obtained on the product composition of the kits and the AGE requirements. However, the 1963 Census "Numerical List of Manufactured Products"⁵ lists the five-digit product class 37214, modifications, conversions, and overhaul of previously accepted aircraft. Consequently kits and labor and materials were coded 3721, aircraft. Engineering and technical data were assigned to 8911,

engineering and architectural services. The related AGE procurement was assumed to have the same product-coded distributions as the common AGE procurement, described later in this paper.

Other. The other category as used here is not a DOD classification. The DOD classification shown in the procurement lists ⁹, ¹⁰, ¹¹ contains the subdivisions shown for this category in table 5.

TABLE 12.—*Aircraft support equipment product-coded distribution*
[OPN3-1940]

SIC	Product	Percent
2295	Coated fabric, not rubberized	2.92
2499	Wood products, n.e.c.	1.50
2599	Furniture and fixtures, n.e.c.	.38
3443	Boilershop products	1.88
3449	Miscellaneous metal work	.38
3499	Fabricated metal products, n.e.c.	.09
3531	Construction machinery	4.42
3537	Industrial trucks and tractors	8.75
3541	Metal-cutting machine tools	1.22
3542	Metal-forming machine tools	.09
3561	Pumps and compressors	1.03
3566	Power transmission equipment	.47
3569	General industry machines, n.e.c.	.94
3571	Computing and related machines	10.07
3585	Refrigeration machinery	1.41
3599	Miscellaneous machinery	18.16
3611	Electric measuring instruments	10.72
3621	Motors and generators	4.33
3622	Industrial controls	.47
3629	Electrical industrial goods, n.e.c.	.38
3642	Lighting fixtures	1.22
3643	Current-carrying devices	.28
3662	Radio, TV communications equipment	7.15
3693	X-ray apparatus and tubes	.38
3694	Engine electrical equipment	.38
3715	Truck trailers	2.54
3717	Motor vehicles and parts	8.28
3722	Aircraft engines and parts	4.14
3729	Aircraft equipment, n.e.c.	.56
3731	Shipbuilding and repairing	.38
3811	Scientific instruments	2.07
3831	Optical instruments and lenses	.85
3861	Photographic equipment	1.79
3999	Miscellaneous products, n.e.c.	.09
8911	Engineering and architectural services	.28
	Total	100.00

The product-coded distribution of OPN3-1940, aircraft support equipment, is given in table 12. The 2.97 percent of the aircraft procurement TOA accounted for by OPN3-1940 is solely Navy procurement. The product-coded distribution was derived from three source documents, the procurement list,⁹ the P-1 exhibit,³¹ and the budget backup justification to the fiscal year 1967 budget submission.³² The first two documents provided a mix of line items of which some could be product-coded on the basis of the information provided and others required additional product detail. This additional detail for products being funded under fiscal year 1965 or fiscal year 1966 TOA was obtained from the budget backup justification.

Of the total DOD aircraft procurement accounted for by component improvement, other production charges, and miscellaneous categories, the service distributions are shown in the accompanying tabulation. Component improvement, as defined in the Air Force "Program Data and Cost Detail,"¹³ covers the procurement of items and other costs incurred for production-component improvement incident to

aircraft, including funds for manufacturing studies. Since no product detail was obtained for the other two categories, they were assumed to have the aircraft flyaway product-coded distribution.

Category	DOD total	Percent		
		Air Force	Navy	Army
Component improvement.....	1.19	0.69	0.43	0.07
Other production charges.....	.92	.52	.40	
Miscellaneous.....	.20			.20

The service distribution of the 0.93 percent of aircraft procurement TOA attributable to the common AGE category was Air Force, 0.60 percent, and Navy, 0.33 percent. The product-coded distribution for this category shown in table 13 was derived from unpublished data obtained from the Department of the Air Force.³³ The source data supplied product detail for items over \$500,000, accounting for approximately 50 percent of the total fiscal year 1966 requirements. Table 13 is the distribution derived from the product-coding of the over-\$500,000 items.

TABLE 13.—Common aerospace ground equipment product-coded distribution

SIC	Product	Percent
3537	Industrial trucks and tractors.....	23.87
3611	Electric measuring instruments.....	6.77
3612	Transformers.....	1.99
3621	Motors and generators.....	13.80
3662	Radio, TV communication equipment.....	39.62
3693	X-ray apparatus and tubes.....	4.64
3722	Aircraft engines and parts.....	5.67
3861	Photographic equipment.....	3.64
	Total.....	100.00

The service distribution of the 0.67 percent of aircraft procurement TOA accounted for by the industrial facilities category was Air Force, 0.42 percent; Navy, 0.18 percent; and Army, 0.07 percent.

Industrial facilities funding provides for the procurement and nonrecurring maintenance of industrial machinery, equipment, and facilities required for expansion of government-owned or private plants necessary for fabrication, modification, or maintenance of aircraft and aircraft components and equipment. The funding also includes the costs of preparation for shipment of industrial machinery, equipment, and tools and the modernization (replacement) of machine tools.¹³ The product-coded distribution for this category (see table 14) is the distribution relevant to the subcategory industrial facilities of the Army's budget activity 10—Production-base support, described in the section "DOD Weapons, Vehicles, and Other Support Procurement."

TABLE 14.—*Industrial facilities product-coded distribution*

SIC	Product	Percent
1511	General building contractors.....	18.50
1731	Electrical work.....	9.25
1799	Special trade contractors, n.e.c.....	1.45
3536	Hoists, cranes, and monorails.....	3.47
3541	Metal-cutting machine tools.....	49.71
3542	Metal-forming machine tools.....	5.20
3545	Machine-tool accessories.....	2.31
3599	Miscellaneous machinery.....	7.51
8911	Engineering and architectural services.....	2.60
	Total.....	100.00

The avionic/armament support equipment, which accounted for 0.20 percent of the aircraft procurement TOA, was an Army procurement line item.¹⁰ No information on the product composition of the item was obtained. The product-coded distribution for peculiar GSE, table 10, was assumed applicable for this category.

The war consumables category, which accounted for 0.15 percent of the aircraft procurement TOA, was an Air Force procurement line item.¹¹ The funding is for procurement of items of equipment involved in the stockage requirements for war consumption including auxiliary fuel tanks, pylons, and ejector racks.¹³ The product-coded distribution for this category (0.6 percent assigned to 1999 and 99.4 percent to 3729) was derived from an unpublished 1965 budget-support document.³⁴

The 0.01 percent of aircraft procurement attributable to first destination transportation reflects an Army procurement line item.¹⁰ This item is identified in the summary table but is not product-coded, since no information was obtained on which coding could be based.

As noted previously, the summary DOD aircraft procurement distribution is shown in table 3. This summary distribution is the result of weighting the distributions of the aircraft categories given in table 5, by the values shown in the same table.

MILITARY SHIP PROCUREMENT

Summary of findings

The total ship procurement distribution is presented in table 15. The two largest codes, SIC 3731, shipbuilding and repairing, and SIC 3662, radio, TV communication equipment, accounted for 76 percent of the total. The six largest codes represent 88 percent of ship procurement, and the remaining 12 percent involved 33 additional codes.

TABLE 15.—*First-order distribution of DOD ship procurement by 4-digit SIC product code*

SIC	Product	Percent
3731	Shipbuilding and repairing.....	60.48
3662	Radio, TV communication equipment.....	16.44
3443	Boiler-shop products.....	6.12
1941	Sighting and fire-control equipment.....	2.25
3511	Steam engines and turbines.....	1.80
3571	Computing and related machines.....	1.71
1911	Guns, howitzers, and mortars.....	1.44
3732	Boat building and repairing.....	1.17
1999	Ordnance and accessories, n.e.c.....	.99
3541	Metal-cutting machine tools.....	.85
3559	Special-industry machinery, n.e.c.....	.73
3542	Metal-forming machine tools.....	.53
3811	Scientific instruments.....	.51
3519	Internal-combustion engines.....	.49
3531	Construction machinery.....	.45
3613	Switchgear and switchboards.....	.45
3691	Storage batteries.....	.45
3621	Motors and generators.....	.39
3569	General-industry machines, n.e.c.....	.36
3564	Blowers and fans.....	.30
3629	Electric industrial goods, n.e.c.....	.27
3561	Pumps and compressors.....	.22
3332	Primary lead.....	.18
3566	Power-transmission equipment.....	.18
3599	Miscellaneous machinery.....	.18
3661	Telephone, telegraph apparatus.....	.18
3494	Valves and pipe fittings.....	.14
3391	Iron and steel forgings.....	.09
3585	Refrigeration machinery.....	.09
3651	Radio and TV receiving sets.....	.09
3821	Mechanical measuring devices.....	.09
2599	Furniture and fixtures, n.e.c.....	.08
3555	Printing-trades machinery.....	.08
3622	Industrial controls.....	.08
3548	Metalworking machinery, n.e.c.....	.05
3357	Nonferrous wire drawing, etc.....	.04
2653	Corrugated shipping containers.....	.03
3831	Optical instruments and lenses.....	.02
3611	Electric measuring instruments.....	(1)
	Total.....	100.00

¹ Less than 0.0005 percent.

Definition of ship procurement

Two budgetary classifications were included in the RAC ship-procurement category. The shipbuilding and conversion, Navy (SCN) appropriation is the largest and accounted for 90 percent of TOA in the RAC category in fiscal year 1965. The other budget component included is budget activity 1, ship support equipment, other procurement Navy (OPN) appropriation, which funds equipment for ships currently in the fleet.⁹ It includes ships-support equipment, shipboard components, other support equipment, and Polaris-support equipment.

Methodology for shipbuilding and conversion, Navy

The analysis of SCN TOA dollars involved several steps. Steps 1 to 3 and 4 to 6 are independent operations that are combined in step 7 to yield the final estimates. Further description of the budget categorization used is presented later in this section.

Step 1: TOA costs from the Navy procurement list¹⁰ were divided by ship type, e.g., destroyer escorts (DE), ammunition ships (AE), nuclear attack submarines (SSN). The ship types were then combined into groups—auxiliary ships, attack ships, amphibious ships, logistic

ships, carriers, submarines, and miscellaneous ships—on the basis of general technical and functional characteristics and similarity of budget component cost distributions. Bureau of Ships personnel assisted in establishing the groupings shown in table 16.

Step 2: TOA for each ship type was then divided into four "budget categories"—basic construction, electrical and mechanical equipment, electronics, and weapons—using percentages obtained from P8-8a exhibits.³⁵ Approximately 93 percent of SCN could be accounted for by using these data. For the other 7 percent, ship types for which backup data were not available, the average percentage distribution for other ships in the same group was applied to TOA to yield the dollar distribution by budget category.

Step 3: The dollar figures by budget category for each ship type obtained in step 2 were combined across all ship types to yield a total dollar figure for each budget category. Each total was then divided by the sum of the four budget categories (TOA for all ships) to obtain a percentage breakdown of TOA for all ships into the four budget categories. The budget-category weights derived were 66.6 percent for basic construction, 13.9 percent for electrical and mechanical, 12.1 for electronics, and 7.4 for weapons.

Step 4: Lists of prime products and prices for items procured within the electrical and mechanical, electronics, and weapons categories were obtained for one ship of each ship type based on historical data for completed ships.³⁶ Basic construction dollars were coded to SIC code 3731, shipbuilding and repairing. The prime product lists for individual ships were assumed to be representative of all ships of the same type.

TABLE 16.—*Ship groupings*

Category	Group
Auxiliary.....	AD, destroyer tender. AE, ammunition ships. AFS, combat store ships. AGC, icebreaker. AGOR, oceanographic research. AGS, surveying ships. T-AK, cargo ship, large. AKA, cargo ship, attack. AO, oiler, fleet. T-AO, tanker. AOR, oiler, fleet replenishment. AS, tender, sub, non-FBM. ATS, tug, salvage. MCS, mine countermeasures, support ship. MSS, mine sweeper, special.
Logistic.....	T-AG (FDL), logistics, fast deployment. LSV, cargo ship, vehicle.
Carrier.....	CVA, carrier, attack aircraft.
Attack.....	DD, destroyer. DE, escort ships. DLG, frigate, guided missile. CG, cruiser, guided missile.
Amphibious.....	LPD, amphibious transport dock. LSD, landing ship, dock. LST, landing ship, tank. LPH, amphibious assault ship. AGC, amphibious force flagship. AOE, combat support ship, fast.
Submarines.....	APSS, transport, submarine. SSN, submarine, nuclear.
Miscellaneous surface ships.....	MSO, mine sweeper, ocean. PGH, gunboat, hydrofoil. PGM, gunboat, motor. Small boats.

Step 5: For each budget category the amount spent per ship type on each prime product was obtained by multiplying the cost of each product on the representative ship by the number of ships of that type being built. The total cost of each prime product within each budget category was then obtained by summing the amount spent per ship type over all ship types (many prime products appeared in more than one ship type).

Step 6: The prime products in each budget category were coded to SIC product codes, and dollars were aggregated by four-digit SIC code. A percentage distribution by SIC code was developed for each budget category by dividing the dollar figure for each code by the sum of the prime product costs within that budget category. (See table 17.)

TABLE 17.—*First-order distributions for electrical and mechanical, electronics, and ordnance budget categories*

Category	SIC	Percent	Category	SIC	Percent						
Electrical and mechanical	3443	45.93	Electrical and mechanical—Con.	3651	.45						
	3511	14.30		Total.....		100.00					
	3662	5.02	Electronics.....				3662	84.37			
	3613	3.94					3571	13.45			
	3811	3.94					3661	1.74			
	3531	3.41					3651	.31			
	3519	2.91					3611	.13			
	3569	2.50					Total.....	100.00			
	3629	2.27							Ordnance.....	1941	33.16
	3632	1.97								3662	27.51
	3621	1.79								1911	21.97
	3566	1.73		1999	10.78						
	3731	1.70	3571	3.80							
	1999	1.62	3599	2.73							
	3332	1.37	3811	.05							
	3564	1.32	Total.....	100.00							
	3691	.97									
	3561	.92									
	3391	.73									
	3585	.63									
3821	.58										

TABLE 18.—*First-order distribution of shipbuilding and conversion, Navy, procurement by 4-digit SIC product codes*

SIC	Product	Percent
3731	Shipbuilding and repairing.....	66.8
3662	Radio, TV communication equipment.....	13.0
3443	Boiler-shop products.....	6.4
1941	Sighting and fire-control equipment.....	2.5
3511	Steam engines and turbines.....	2.0
3571	Computing and related machines.....	1.9
1911	Guns, howitzers, mortars, and related equipment, over 30 mm.....	1.6
1999	Ordnance and accessories, n.e.c.....	1.0
3531	Construction machinery.....	.5
3613	Switchgear and switchboards.....	.5
3811	Scientific instruments.....	.5
3519	Internal-combustion engines.....	.4
3569	General-industry machines, n.e.c.....	.4
3621	Motors and generators.....	.3
3629	Electric industrial goods, n.e.c.....	.3
3732	Boat building and repairing.....	.3
3332	Primary lead.....	.2
3564	Blowers and fans.....	.2
3566	Power-transmission equipment.....	.2
3599	Miscellaneous machinery.....	.2
3661	Telephone, telegraph apparatus.....	.2
3391	Iron and steel forgings.....	.1
3561	Pumps and compressors.....	.1
3585	Refrigeration machinery.....	.1
3651	Radio and TV receiving sets.....	.1
3691	Storage batteries.....	.1
3821	Mechanical measuring devices.....	.1
	Total.....	100.0

Step 7: The percentage figure thus obtained for each SIC code within the four budget categories was then multiplied by the appropriate percentage figure for its budget category obtained in step 3, to yield the percentage that each SIC code was of the TOA for all ships. Codes appearing in more than one budget category were aggregated. Table 18 gives the SIC product-code distribution for SCN.

Ship support equipment (OPN-1)

Analysis of ship support equipment (OPN) consisted of assigning SIC codes to itemized lists of prime products. These lists were obtained from two sources: the Navy procurement list,⁹ and P-1 backup sheets.³¹ The procurement list contains three types of line items: specific products that could be coded directly; miscellaneous groupings of smaller products combined under the line item Items less than \$2 million, and other aggregative categories such as spares and repair parts.

A partial itemization of items less than \$2 million was obtained from the P-1 backup sheets.³¹ These sheets contained lists of all equipment being procured in excess of \$500,000. These lists were coded, and their percentage distribution by SIC code was applied to the control totals for items less than \$2 million given in the procurement list. The dollar figures obtained for SIC codes for items less than \$2 million were combined with dollar figures for specific products in the procurement list. TOA for aggregative categories for which product detail was not available was allocated by SIC in the same proportions as the previously derived distribution. The distribution for total ship support equipment is presented in table 19. The distribution was combined (using TOA weights) with the distribution obtained for SCN to yield the distribution for total ship procurement shown in table 15.

TABLE 19.—*First-order distribution of ship support equipment (OPN-1) procurement by 4-digit SIC product code*

SIC	Product	Percent
3662	Radio, TV communication equipment.....	47.7
3732	Boat building and repairing.....	9.1
3541	Metal-cutting machine tools.....	8.6
3559	Special industry machinery, n.e.c.....	7.4
3542	Metal-forming machine tools.....	5.3
3601	Storage batteries.....	3.6
3443	Boiler shop products.....	3.5
3731	Shipbuilding and repairing.....	3.1
3494	Valves and pipe fittings.....	1.4
3519	Internal-combustion engines.....	1.3
3561	Pumps and compressors.....	1.3
3564	Blowers and fans.....	1.2
3621	Motors and generators.....	1.2
1999	Ordnance and accessories, n.e.c.....	.9
2599	Furniture and fixtures, n.e.c.....	.8
3555	Printing-trades machinery.....	.8
3622	Industrial controls.....	.8
3811	Scientific instruments.....	.6
3548	Metalworking machinery, n.e.c.....	.5
3357	Nonferrous wire drawings, etc.....	.4
2653	Corrugated shipping containers.....	.3
3831	Optical instruments and lenses.....	.2
	Total.....	100.0

TABLE 20.—Percentage distribution of cost items, by ship type¹

Cost category	Submarine tender, AS	Amphibious transport, dock, LPD	Destroyer escort, DE	Fast combat support ship, AOE
1. Hard core:				
Lead costs.....	10	2	0	3
Basic construction or conversion.....	52	69	37	70
Change orders.....	3	3	5	6
Electronics GFM.....	2	5	17	1
Nonelectronics GFM.....	7	3	16	4
Post delivery.....	3	2	4	5
Other costs.....	0	1	0	0
Weapons GFM.....	19	1	7	(?)
Total.....	96	86	86	89
2. Projected growth:				
Future characteristics changes.....	1	2	7	1
Projected escalation.....	1	7	3	8
Electronics growth.....	(?)	2	0	(?)
Other growth.....	1	3	3	2
Weapons growth.....	1	(?)	1	(?)
Total.....	4	14	14	11
Total end cost.....	100	100	100	100

¹ Based on cost estimates per ship, derived from fiscal year 1963 data from P8-8a budget backup sheets.

² Less than 0.5 percent.

Additional detail on SCN budget categorization

SCN budget component outline:

1. Total hard core:
 - A. Basic construction.
 - B. Government-furnished materiel:
 - Nonelectronics.
 - Electronics.
 - Weapons.
2. Total projected growth:
 - A. Basic construction:
 - Projected escalation.
 - B. Government-furnished materiel:
 - Electronics growth.
 - Weapons growth.

Description of categories. Ship cost can be divided into the categories just shown in the budget component outline. Category 1 represents current price estimates of the planned ship type, given its present design characteristics. Category 2 is used to incorporate expected price increases over the period between funding and completion of the ships. This category attempts to provide for anticipated changes in ship characteristics, shipboard electronics, weapons, etc.

The P8-8a backup sheets contain cost summaries by ship type. Hard core (category 1) costs are divided into eight subcategories: Lead costs, basic construction or conversion, change orders, electronics GFM, nonelectronics GFM, post delivery, other costs, and weapons GFM. Total projected growth (category 2) was divided into future characteristics changes, projected escalation, electronics growth, other growth, and weapons growth. Table 20 presents examples of the type of cost categorization contained in the P8-8a exhibits.

Because prime product lists were given on a budget category basis, it was necessary to relate the cost classification given in the P8-8a to the four major budget categories. To accomplish this it was necessary to investigate the contents of the cost items shown in table 20. A brief description of each category follows.

Lead costs: These costs generally may be divided into two types: test and instrumentation, and development of working drawings. Test and instrumentation funds are usually established to account for the government effort involved in providing shock tests, weapon evaluation, etc. The development of working drawings usually is performed by the shipbuilding contractor. The composition of lead costs varies with respect to contracting policy and ship type. This item was distributed proportionately to the final budget categories.

Basic construction. Dollars in this category represent the prime contract award for the shipbuilding effort. This category includes costs associated with CFE, basic materials purchased, shipyard overhead, and profits.

Nonelectronics (GFM): This category represents electrical and mechanical equipment that the government has decided to supply to the contractor. There is basically little difference between the types of equipment being furnished under this category and the electrical and mechanical items usually found in CFE.

Electronics (GFM): Dollars in this category represent items that are always supplied by the government. Within a given ship type and "ship-group" category there is usually a great deal of stability with respect to electronics package dollars. Integration of systems found on other ships (such as sonar detecting and fire control) but previously foreign to the type in question may introduce changes.

Weapons (GFM): Ordnance items, like electronics, are always furnished by the government. The stability of this category is usually determined by considerations of mission and state of the art.

Change orders and post delivery: Dollars in this category are associated with shipbuilding contract activity and are intended to account for changes in design criteria or equipment selection initiated by the government and to cover the cost of repairing material and equipment damaged during test and evaluation. These cost items were assigned to the basic construction budget category.

Other costs: Navy management activities concerning engineering, quality control, equipment integration, material programing, etc., are included in this category. Assignment of these costs varies with ship types and contract policy. These costs were distributed in the same manner as lead costs.

Future characteristics changes: Growth costs are estimated in an effort to account for changes in mission requirements and ship characteristics. The purpose of this account is to provide funds for anticipated changes in ship construction, nonelectronic (electrical and mechanical) items, electronic equipment, or weapons. Costs under this heading were allocated proportionately to the four budget categories in the same manner as lead costs.

Projected escalation: Anticipated changes in the cost of basic construction generated over the long leadtime of a ship type provide the basis for this budget category. Escalation costs were included in the basic construction budget category.

Electronics growth and weapons growth. These items represent anticipated changes in the costs of electronics and ordnance items. TOA for these items was assigned to the electronics and weapons budget categories.

Other growth: Anticipated costs associated with change orders are included here. Costs were proportionately distributed to the four budget categories.

The distribution of cost items to major budget categories is summarized in figure 1.

Cost item	Budget category				
	Basic construction	Electronics GFM	Nonelectronics GFM	Weapons GFM	Miscellaneous*
1. Lead costs					●
2. Basic construction and conversion	●				
3. Change orders	●				
4. Electronics GFM		●			
5. Nonelectronics GFM			●		
6. Post delivery	●				
7. Other costs					●
8. Weapons GFM				●	
9. Future characteristics changes					●
10. Projected escalation	●				
11. Electronics growth		●			
12. Other growth					●
13. Weapons growth				●	

Fig. 1.—Distribution of Cost Items to Budget Categories

*Distributed proportionately among the preceding four budget categories.

DOD MISSILE PROCUREMENT

Summary of findings

The complete distribution of DOD missile procurement by SIC product code is presented in table 21. As indicated, the three largest codes accounted for 82 percent of the total, and the five largest represent 93 percent. Eighteen additional codes are included in the remaining 7 percent.

TABLE 21.—First-order distribution of DOD missile procurement by 4-digit SIC product code

SIC	Product	Percent
1925	Complete guided missiles.....	34.97
3662	Radio, TV communication equipment.....	28.47
3722	Aircraft engines and parts.....	19.39
3729	Aircraft equipment, n.e.c.....	8.81
3545	Machine tool accessories.....	1.70
3541	Metal-cutting machine tools.....	1.65
2892	Explosives.....	1.40
3611	Electric measuring instruments.....	.93
1999	Ordnance and accessories, n.e.c.....	.46
3717	Motor vehicles and parts.....	.36
3537	Industrial trucks and tractors.....	.21
3357	Nonferrous wire drawing, n.e.c.....	.20
3461	Metal stampings.....	.17
3679	Electronic components, n.e.c.....	.17
3585	Refrigeration machinery.....	.16
3691	Storage batteries.....	.16
3661	Telephone, telegraph apparatus.....	.16
3694	Engine electrical equipment.....	.16
3613	Switchgear and switchboards.....	.15
3491	Metal barrels, drums and pails.....	.06
3571	Computing and related machines.....	.06
3323	Steel foundries.....	.03
3621	Motors and generators.....	.03
	Total.....	100.00

Definition of missile procurement

The missile procurement funds covered in the analysis are shown in table 22. Funds from Air Force, Navy, Army, and Marine Corps appropriations for relevant budget activities are included. For analysis of product composition, total missile procurement funds were categorized as follows: Flyaway, modifications, spares and repair parts, missile support equipment, procurement support, and miscellaneous. (See table 23.)

TABLE 22.—*Appropriations and budget activity classes included in missile procurement*

Department	Appropriation title	Budget activity
Air Force.....	Missile procurement.....	1. Ballistic missiles. 2. Other missiles. 3. Modification of in-service missiles. 4. Spares and repair parts. 5. Other support.
Navy and Marine Corps.	Procurement of aircraft and missiles, Navy (PAMN).	8. Ballistic missiles. 9. Other missiles. 10. Modification of missiles. 11. Missile spares and repair parts. 12. Other support equipment and facilities.
Army.....	Procurement, Marine Corps (PMC) Procurement of equipment and missiles, Army (PEMA).	2. Guided missiles and equipment. 3. Missiles. 4. Missile spares and repair parts. 10. Production-base support (part).

TABLE 23.—*Categorization of missile procurement TOA for analysis of product composition*

Category	Percent
Flyaway.....	1 47
Nonflyaway:	
Modifications.....	2 6
ICBM.....	3
Other than ICBM.....	3
Spares and repair parts.....	2 7
Flyaway spares.....	3
Nonflyaway spares.....	4
Procurement support.....	7
Missile support equipment.....	2 19
ICBM.....	14
Other than ICBM.....	5
Other.....	14
Total.....	100

¹ Based on fiscal year 1963 data except for Air Force nonballistic missiles, for which fiscal year 1965 data were used.

² Subtotal for items in category.

Methodology

The starting points of the analysis were the Air Force,³⁷ Navy,³⁸ and Army³⁹ procurement lists submitted by the military departments to OSD as part of the FYFSFP. The line items in these procurement lists display considerable diversity with respect to levels of aggregation. For all procurement-list line items representing aggregations of products (more than one four-digit SIC product code), further breakdown was attempted.

Procurement line items were first divided into the general categories shown in table 23, utilizing Air Force,⁴⁰⁻⁴⁴ Navy,⁴⁵⁻⁴⁷ and Army⁴⁸⁻⁵¹

budget backup exhibits. Because of differences in the composition of missile procurement between fiscal year 1963 and fiscal year 1965, fiscal year 1963 data were used for the categorization as the best approximation of the calendar year 1963 distribution required for interindustry applications. Methods used for deriving SIC distributions for each of the categories shown in table 23 are described below. Since fiscal year 1963 data at the required level of detail were not available for disaggregation of many of the categories, fiscal year 1964 and fiscal year 1965 data were used.

Flyaway.—Flyaway TOA was further divided into funding for ballistic missiles (ICBM's and Polaris) and for all other missiles. Ballistic missile funding was subdivided into TOA for airframe, assembly, and checkout, guidance, propulsion, and payload. TOA for all other missiles was divided into costs for guidance, control, and airframe, propulsion, and payload. The data for these subdivisions of missile flyaway costs were from budget backup exhibits.⁴⁰⁻⁵¹

An attempt was made to assign SIC codes to products directly procured by DOD. For ballistic missiles, examination of the Minuteman program indicated that major components are procured separately by DOD and shipped to a central location to be assembled. In the case of Minuteman, Boeing as prime contractor manufactures the airframe and performs assembly and checkout of the complete missile. Associate prime contractors produce the other major components for DOD (Autonetics—guidance; Thiokol, Aerojet General, and Hercules—propulsion; AVCO—reentry vehicle). It was assumed that DOD also procured major components separately for other ballistic missiles. The following SIC code assignments for ballistic missile funding were made: Assembly and checkout (including airframe), SIC 1925; guidance, SIC 3662; propulsion, SIC 3722; and payload, SIC 3729.

For all other missiles it was assumed for coding purposes that the guidance, control, and airframe portion of missile flyaway was procured as a unit from a prime contractor and that the propulsion system and payload were procured separately by DOD. Examination of Sparrow, Terrier, Pershing, Bullpup, and Shillelagh contracting patterns shown in the *Weapons Dictionary*^{21, 23, 24} indicated that this procedure is generally representative. Since SIC 1925 includes complete missiles, excluding propulsion and since nuclear warhead costs are not included in DOD funding, the following SIC code assignments were made: Guidance, control, and airframe, SIC 1925; propulsion, SIC 3722; and payload, SIC 3729.

Modifications. Modifications funding was divided into two categories for analysis: ICBM modifications and other missile modifications. Each category accounted for 50 percent of total TOA for missile modifications in fiscal year 1963. The two analyses are discussed in the next paragraphs.

ICBM modifications: A breakdown of Minuteman II modifications (fiscal year 1965) was used to represent all ICBM modifications. Identification of item and service components of the Minuteman II modifications program was based on unpublished tabulations obtained from Headquarters Air Force, Directorate of Production,⁴² and on Boeing⁵² and Autonetics⁵³ publications. The distribution derived for ICBM modifications is shown in the accompanying tabulation:

SIC Code	Percent
Hardware	64
1925	4
3323	2
3571	2
3611	13
3662	43
Nonhardware	36
3662 Assembly and checkout	30
1925 Technical data	6
Total	100

Other missile modifications: TOA for non-ICBM modifications in fiscal year 1963 was divided as follows: Army, 82 percent; Air Force, 15 percent; Navy, 3 percent. Army modifications were distributed by SIC code based on data from the Army materiel plan (AMP)⁴⁹ and supplement.^{50, 51} Distribution of Air Force totals were based on data from Air Force form 1300g.⁵⁴ (See table 24.) Non-hardware items shown later in table 27 were coded as follows: Engineering, SIC 1925; technical data, SIC 1925; and related AGE, SIC 3729.

TABLE 24.—Air Force missile modifications, non-ICBM

Category	Percent
Engineering	31.7
Technical data	1.0
Related AGE	.6
Hardware	66.7
Kits, group A	.8
Kits, group B	52.0
Fuze conversion	.5
Container modifications	.1
New containers	.4
AGE modifications	1.4
Spares modifications	.9
Class IV modifications	10.6
Total	100.0

Hardware costs were primarily for modification of the Falcon AIM-4 missile. The hardware modifications distribution for the Falcon was coded and used to represent all Air Force non-ICBM modifications. The distribution for the Falcon is shown in table 25.

TABLE 25.—Distribution percentages for Falcon modifications

Category	Percent	SIC
Kits, group B ¹	93	
Guidance and control modifications	76	3662
Propulsion modifications	13	3722
Payload modifications	4	3729
Fuze conversion	1	3722
Container modifications	(²)	3491
New containers	1	3491
AGE modifications	3	1925
Spares modifications	2	1925
Total hardware costs	100	

¹ Distribution of group B kits was estimated, based on data for the Sparrow AIM 7-E, from Air Force cost analysis sheets. (See footnote 22 at end of section.)

² Less than 0.5 percent.

No data permitting examination of the composition of Navy modifications were discovered. The Army and Air Force distributions described above were combined (weighted by fiscal year 1965 TOA) and applied to the Navy total.

Spares and repair parts. This category includes spares for the missiles themselves (flyaway spares) and for missile support equipment (nonflyaway spares). In fiscal year 1963 the Air Force accounted for 67 percent of total DOD funding for missile spares and repair parts, the Navy, 23 percent; the Army, 7 percent; and the Marine Corps, 3 percent.

Sources of data for identification of first-order impact were AFLC machine printouts of missile spares procurement by missile and by materiel program code (MPC) for fiscal year 1963⁵⁵ and the AMP.⁵⁰ Investigation of data sources at the Navy Bureau of Weapons and at the Ships Parts Control Center, Mechanicsburg, Pa.,⁵⁶ indicated that deriving breakdowns of Navy missile spares procurement would require a level of effort not justified by the quality of the data that could be obtained. The Air Force distribution, with minor alterations, was applied as the best available substitute to the funding total for Navy spares.

Total spares procurement was divided into flyaway and nonflyaway categories for coding purposes. Flyaway spares were divided into airframe spares, guidance and control spares, propulsion spares, and payload spares, based on data from AFLC⁵⁵ and from the AMP.⁴⁸ The following SIC code assignments were made: Airframe, SIC 3729; guidance and control, SIC 3662; propulsion, SIC 3722; and payload, SIC 3729.

Even less detail is available for nonflyaway spares. The AFLC computer printouts⁵⁵ lump the bulk of Air Force dollars in this category into one line item, AGE spares. The AMP⁴⁸ provides a division by Federal supply classification code: 1430 remote control spares, 1440 launcher spares, and 4935 specialized test equipment spares. Since these data were inadequate for assignment of SIC codes, the SIC distributions derived for missile support equipment (described in the following paragraphs) were applied to nonflyaway-spares procurement dollars, based on the assumption that the spares for missile support equipment would be distributed by SIC in approximately the same fashion as the equipment itself.

Missile support equipment. This category was further subdivided into ICBM support equipment and missile support, other than ICBM. Coding techniques for these categories are discussed in the following paragraph.

ICBM support equipment. This category represents TOA for Air Force ICBM support. A breakdown was derived for Minuteman II support equipment and used to distribute all TOA assigned to ICBM support equipment. Minuteman II support equipment procurement includes the categories shown in the accompanying tabulation:⁴²

Category	Percent
Sets of equipment for launch facility (LF) and launch control facility (LCF)	50
Maintenance ground equipment (MGE)	32
Tooling and production support	5
Engineering change orders	13
Total	100

Boeing⁵² and Autonetics⁵³ contract data and Air Force ground equipment listings^{42, 57} were used to distribute the launch facility and launch control facility equipment and maintenance ground equipment totals. Tooling and production support were coded SIC 3541; engineering change orders were coded SIC 1925.

Missile support other than ICBM: Separate examination and coding were performed for Navy, Air Force, and Army funding in this area. Navy distributions were based on data from budget backup exhibits.^{45, 46} Navy missile support consisted primarily of technical engineering services, SIC 1925; publications, SIC 1925; depot checkout equipment, SIC 3662; and special handling equipment, SIC 3537. The Air Force missile support distribution was based on data from budget backup exhibits⁴⁰⁻⁴⁴ and included depot checkout and special handling equipment, SIC 3662; and engineering services, publications, etc., SIC 1925. Army missile support was distributed based on AMP data.⁴⁸⁻⁵¹ Approximately 23 percent of total funding represented technical engineering services, documentation, quality assurance, and testing, all of which were coded SIC 1925. The remaining 77 percent, which represented hardware costs, was distributed based on detail available for Hawk ground equipment.⁴⁸ The Hawk distribution is shown on table 26.

TABLE 26.—Distribution percentages for Hawk ground equipment

Category	Percent	SIC
Launcher.....	18	1999
High-power illuminator.....	16	3662
Rails, launching and handling.....	16	1925
Carrier.....	14	3717
CW acquisition radar.....	12	3662
Pulse acquisition radar.....	5	3662
Battery command console.....	5	3662
Confidence checker.....	4	3662
Loader.....	4	3537
Assault fire command console.....	3	3662
Cable.....	1	3557
Maintenance sets.....	1	3611
Generators.....	1	3621
Total.....	100	

Procurement support. The procurement support category includes TOA for items identified in the missile budget backup exhibits cited previously as product engineering, special tools and inspection gauges, evaluation services and materials, production proof, containers, product improvement, and documentation. Table 27 presents the distribution and coding that were derived.

Other. This category includes the heterogeneous items shown in table 28.

Site activation related solely to the Air Force Minuteman program, and consisted primarily of contractor support activities, including administrative and other services.⁴² All site activation funding was coded to SIC 1925. Missile industrial facilities were not separately identified but were considered to represent tooling costs primarily and were coded to SIC 3541. Training equipment was not completely identified at the individual item level; where detail was available the items were primarily electronic, and all TOA in this category was

coded to SIC 3662. Information in the Navy Weapons Dictionary Materiel Annex²⁴ concerning the astronautics category (which appeared only in Navy procurement data) indicated that it also consisted primarily of electronic equipment; all astronautics funding was coded SIC 3662. The Air Force propellants category was coded to SIC 2892.

TABLE 27.—*Distribution percentages for procurement support*

Category	Percent	SIC
Product engineering.....	47	1925
Special tools and inspection gauges.....	31	3545
Evaluation services and production proof.....	17	1925
Containers.....	2	3491
Documentation.....	2	1925
Product improvement.....	1	1925
Total.....	100	

TABLE 28.—*Distribution percentages for other items of missile procurement*

Category	Percent
Site activation.....	81
Missile industrial facilities.....	5
Training equipment.....	1
Astronautics.....	3
Propellants.....	10
Total.....	100

METHODOLOGY EMPLOYED FOR ELECTRONICS AND COMMUNICATIONS AMMUNITION AND WEAPONS, VEHICLE, AND OTHER PROCUREMENT

The general methodology used to derive the first-order impact of these procurement activities consisted of (a) developing a list of items being procured under each budget activity; (b) assigning product codes to the items; and (c) consolidating the associated TOA to four-digit levels and aggregating the results over the group. Procurement items were originally coded on a seven-digit SIC product-code basis to meet an earlier assignment dealing with the improvement of exemplar selection. For purposes of this study, products were aggregated to provide estimates of first-order impact.

The primary sources used in deriving the necessary product detail were the materiel annex procurement lists of each service.^{9, 10, 12} Line items in these primary sources were generally of two types: end-items, i.e., items that could be directly coded, and miscellaneous generic categories requiring disaggregation before product-coding could be performed. Examples of the generic categories are items less than \$2 million and spare parts. For items less than \$2 million, procurement support documents^{31, 58} were used for disaggregation. The support documents provided sample lists rather than complete coverage for the following reasons: (a) supporting data did not include items less than \$500,000 so that a complete accounting of items less than \$2 million could not be made; (b) owing to the difference in submission dates between the primary data sources^{9, 12} and the supporting documents, variations existed between the TOA totals for given pieces of equipment. Sample-based distributions were adjusted to control totals from the materiel annex procurement lists.

DOD electronics and communication procurement

Summary for findings. The complete product-coded distribution for DOD electronics and communications procurements is shown in table 29. As shown in table 29, six major product codes accounted for 97 percent of fiscal year 1965 electronics and communications procurement. The remaining 3 percent was distributed among 21 separate four-digit product codes. Almost 80 percent of the total was represented by one four-digit code—3662, radio, TV communication equipment—and the three largest codes accounted for 94 percent of the total.

Definition of electronics and communications procurement. The budget activity categories included in the distribution are shown in table 30. Only parts of OPN, budget activities 3 and 6, are included.

TABLE 29.—*First-order distribution of DOD electronics and communication procurement by 4-digit SIC product code*

SIC	Product	Percent
3662	Radio, TV communication equipment.....	77.92
3571	Computing and related machines.....	8.29
3661	Telephone, telegraph apparatus.....	7.83
3621	Motors and generators.....	1.25
3357	Nonferrous wire drawing, etc.....	1.16
3679	Electronic components, n.e.c.....	1.04
1941	Sighting and fire-control equipment.....	.59
3861	Photographic equipment.....	.36
3611	Electric measuring instruments.....	.34
3651	Radio and TV receiving sets.....	.21
3461	Metal stampings.....	.19
2731	Books, publishing, printing.....	.13
3629	Electric industrial goods, n.e.c.....	.10
3729	Aircraft equipment, n.e.c.....	.09
3717	Motor vehicles and parts.....	.08
3441	Fabricated structural steel.....	.07
3585	Refrigeration machinery.....	.07
3613	Switchgear and switchboards.....	.07
3694	Engine electrical equipment.....	.06
3315	Steel wire drawing, etc.....	.04
3691	Storage batteries.....	.04
3811	Scientific instruments.....	.02
3351	Copperrolling and drawing.....	.01
3572	Typewriters.....	.01
3642	Lighting fixtures.....	.01
3731	Shipbuilding and repairing.....	.01
3831	Optical instruments and lenses.....	.01
	Total.....	100.00

TABLE 30.—*Appropriations and budget activity classes included in electronics and communications procurement*

Department	Appropriation title	Budget activity
Air Force.....	Other procurement.....	3. Electronics and telecommunications equipment. — CRYPTO and SIGINT equipment. — Electronics and telecommunications modifications.
Navy and Marine Corps.....	Other procurement, Navy (OPN).....	2. Communications and electronic equipment. 3—1930 Ground electronics. 6—2210 Equipment, personnel support.
	Procurement, Marine Corps (PMC).....	3. Communications and electronic equipment.
Army.....	Procurement of equipment and missiles, Army (PEMA).	7. Communications and electronic equipment.

Methodology. General methodology is described at the beginning of this section. Of the basic sources^{9, 10, 12} the Army end-item list¹⁰ was in sufficient detail to eliminate the need for identifying lower-cost items, with the exception of the aggregation, miscellaneous electronics. Its product distribution was identified from data in volume II of the AMP.⁵⁸ An Air Force procurement support document⁵⁹ was used to identify items less than \$2 million and organizational and base support equipment. This document provides lists of equipment in excess of \$500,000. The remaining values for items less than \$500,000 were relatively small and further product identification was not attempted.

Electronics and communications procurement lists included generic "systems" categories (generic titles for aggregations of equipment). Examples of systems line items are missile communications support; 412L, air weapons control system; and 433L, weather observation and forecast system.

Identification and quantification of end products involved in electronics systems proved to be difficult because of limitations of published data sources. Although AMP⁵⁸ did include information about some Army systems, a major portion of "system" dollars remained for product identification, and additional data collection was required. The PEMA development division⁶⁰ provided shopping lists and technical product information pertaining to air defense operating centers and fire-direction systems and procurement lists for communications and cryptographic systems such as Alternate National Military Command Center and Strategic Army Communications.

Several offices supplied Navy system procurement lists. Dollar values for the category items less than \$500,000 were large enough to warrant further product search, and the following information was obtained: a computer listing of all items being procured as ground electronics in budget activity 3, weapons and support equipment;⁶¹ shopping lists of equipment being procured for the CAESAR sonar system;⁶² shopping lists of equipment (representing prime contracts) being procured for naval tactical data system (NTDS) and operational control centers (OPNCON);⁶³ shopping lists for Atlantic Fleet Weapons Range and items less than \$500,000;⁶⁴ technical advise on SISS II sonar system procurement;⁶⁵ detailed shopping lists of personnel support equipment;⁶⁶ and added information pertaining to Navy electronics spares procurement and Marine electronics shopping lists.⁶⁷

Collection of data on Air Force systems involved visits to a number of systems project offices in the Boston and Los Angeles areas. Data on the major portion of missile communications support, namely, Minuteman⁶⁸ and space systems,⁶⁹ were obtained from offices in the Los Angeles area. The Minuteman Special Projects Office⁷⁰ provided Minuteman electronics data. Individual systems project offices at Electronic Systems Division, Bedford, Mass., provided the necessary shopping lists of prime products being procured in fiscal year 1965 for Air Force L-systems, e.g., 412L, air weapons control system; 433L, weather observation and forecast system. Dollars for Eastern and Western Test Ranges under missile communication support were

identified to prime products based on data obtained from Air Force Systems Command Headquarters at Andrews Air Force Base.⁷¹

No other documents were used for reduction of budget categories to end products; however, for determining and assigning specific product codes such documents as the Army Materiel Annex,²³ the Navy Materiel Annex,²⁴ and the Air Force Weapons Dictionary²¹ were used. In addition, six unclassified manuals containing descriptions of telecommunications, fire-control computers, search and detection apparatus, and electronics training equipment are listed under "Additional References."

DOD ammunition procurement

Summary of findings. The complete distribution of DOD ammunition procurement by SIC product-code is presented in table 31. The largest code, SIC 1929 (ammunition, n.e.c.), accounted for 80 percent of the total. The five largest codes accounted for 98 percent of the total, and five additional codes were represented in the remaining 2 percent.

Definition of ammunition procurement. The composition of the ammunition procurement group is presented in table 32 in terms of budget activities within appropriation categories by service. As indicated in the table, only those subcategories of OPN, budget activity code 3, that relate to ammunition procurement are included.

TABLE 31.—*First-order distribution of DOD ammunition procurement by 4-digit SIC product codes*

SIC	Product	Percent
1929	Ammunition, n.e.c. ¹	79.94
1961	Small-arms ammunition.....	6.03
3662	Radio, TV communication equipment ²	5.37
1999	Ordnance and accessories, n.e.c.....	4.42
3729	Aircraft equipment, n.e.c. ³	2.53
2899	Chemical preparations, n.e.c.....	.58
3722	Aircraft engines and parts.....	.49
1951	Small arms, 30 mm. and under.....	.32
2818	Organic chemicals, n.e.c.....	.18
2911	Petroleum refining.....	.14
	Total.....	100.00

¹ Includes bombs, rockets, depth charges, mines, torpedoes.

² Time and proximity fuzes (electronic) and sonar mines.

³ Includes bomb lugs and racks.

TABLE 32.—*Appropriation and budget activity classes included in ammunition procurement*

Department	Appropriation title	Budget activity
Air Force.....	Other procurement.....	1. Munitions and associated equipment.
Navy and Marine Corps.	Other procurement, Navy (OPN)....	3—1910 Expendable ordnance.
		3—1920 Ordnance equipment.
	Procurement, Marine Corps (PMC)....	1.A. Ammunition.
Army.....	Procurement of equipment and missiles, Army (PEMA).	9. Ammunition.

Methodology. General methodology is described at the beginning of this section. For all generic categories except items less than \$2 million (Air Force spares and repair parts, Navy expendable ordnance support parts, and ORDALT material, general, Army miscellaneous, and other items) products detail was not available, and TOA amounts for these items were distributed proportionately over the previously derived product distributions.

Documents used for determining and assigning specific product codes include the following: The Army Materiel Annex;²³ The Navy Materiel Annex;²⁴ The Air Force Weapons Dictionary;²¹ Picatinny Arsenal, "Information Pertaining to Fuzes";⁷² Bureau of Naval Weapons, "Torpedo MK46 Illustrated Parts Breakdown";⁷³ Bureau of Naval Weapons, "Snakeye I Weapon."⁷⁴ In addition, six unclassified manuals containing descriptions of explosives, chemical agents, and ammunition were used.⁷⁵⁻⁸⁰

DOD weapons, vehicles, and other support procurement

Summary of findings. The complete distribution of DOD weapons, vehicles, and other support procurement is presented in table 33. The two leading codes, SIC 3717,* motor vehicles and parts, and SIC 1931, tanks and tank components, accounted for 57 percent and the remaining eight codes accounted for 26 percent of the group's total procurement TOA. In all, 97.5 percent of the group's TOA was distributed over 61 4-digit SIC codes. Of the remaining 2.5 percent, 1.4 percent was identified as first destination transportation of Army procurement items and 1.1 percent was not coded because of lack of information. It should be noted that first destination transportation costs in Air Force and Navy procurement could not be separately identified and are therefore included in the product distribution.

*The Bureau of the Census classification code 3717, motor vehicles and parts, was used in place of the constituent SIC codes 3711; motor vehicles, 3712; passenger car bodies; and 3714, motor vehicle parts and accessories.

TABLE 33.—*First-order distribution of DOD weapons, vehicles, and other support procurement by 4-digit SIC product codes*

SIC	Product	Percent
3717	Motor vehicles and parts ¹	36.54
1931	Tanks and tank components.....	20.71
3621	Motors and generators.....	4.29
3531	Construction machinery.....	4.08
3715	Truck trailers.....	3.24
3571	Computing and related machines.....	3.22
3861	Photographic equipment.....	3.10
3662	Radio, TV communications equipment.....	2.83
3537	Industrial trucks and tractors.....	2.56
3611	Electric measuring instruments.....	2.43
3541	Metal-cutting machine tools.....	2.08
3731	Shipbuilding and repairing.....	1.84
8911	Engineering and architectural services.....	1.18
3842	Surgical appliances and supplies.....	.93
1911	Guns, howitzers, and mortars.....	.75
1511	General building contractors.....	.63
2399	Textile products, n.e.c.....	.63
2499	Wood products, n.e.c.....	.55
3542	Metal-forming machine tools.....	.41
3446	Architectural metal work.....	.32
1731	Electrical work.....	.31
2295	Coated fabrics, not rubberized.....	.30
1999	Ordnance and accessories, n.e.c.....	.28
3069	Rubber products, n.e.c.....	.28
3429	Hardware, n.e.c.....	.26
3599	Miscellaneous machinery.....	.26
3679	Electronic components, n.e.c.....	.26
3561	Pumps and compressors.....	.25
3585	Refrigeration machinery.....	.25
3811	Scientific instruments.....	.22
1951	Small arms, 30mm. and under.....	.21
3642	Lighting fixtures.....	.21
3449	Miscellaneous metal work.....	.18
3443	Boiler-shop products.....	.16
3582	Commercial laundry equipment.....	.14
1929	Ammunition, n.e.c.....	.12
3494	Valves and pipe fittings.....	.12
2328	Work clothing.....	.11
2394	Canvas products.....	.11
3536	Hoists, cranes, and monorails.....	.11
3729	Aircraft equipment, n.e.c.....	.11
3079	Plastics products, n.e.c.....	.09
3141	Shoes, except rubber.....	.09
3589	Service industry machines, n.e.c.....	.09
3545	Machine-tool accessories.....	.08
3431	Metal plumbing fixtures.....	.06
3519	Internal-combustion engines.....	.06
3999	Miscellaneous products, n.e.c.....	.06
3315	Steel wire drawing, etc.....	.05
1799	Special-trade contractors, n.e.c.....	.04
3549	General-industry machines, n.e.c.....	.04
3612	Transformers.....	.04
3821	Mechanical measuring devices.....	.04
2298	Cordage and twine.....	.02
2819	Inorganic chemicals, n.e.c.....	.02
3548	Metalworking machinery, n.e.c.....	.02
3831	Optical instruments and lenses.....	.02
3532	Mining machinery and equipment.....	.01
3555	Printing-trades machinery.....	.01
3564	Blowers and fans.....	.01
3693	X-ray apparatus and tubes.....	.01
	First destination transportation.....	1.43
	Unallocated.....	1.14
	Total.....	100.00

¹ Includes SIC 3717411, combat vehicles, wheeled tactical vehicles or carriers.

Definition of weapons, vehicles, and other support procurement. The composition of the weapons, vehicles, and other support group is presented in table 34 in terms of budget activities within appropriation categories by service. The table also shows the percentage distribution of the fiscal year 1965 TOA group total by budget activity and by service.

It is evident from the table that the Army's procurement, at 69 percent of the group total, is dominant in this group; further, within the Army's procurement the two budget activities, weapons and combat vehicles and tactical and support vehicles, which together comprise 53 percent of the group total and 75 percent of the Army's proportion of the group total, are of major importance in determining the product composition of the group.

TABLE 34.—*Appropriations and budget activity classes included in weapons, vehicles, and other support procurement*

Department	Appropriation title	Budget activity	Percent
Army.....	Procurement of equipment and missiles, Army (PEMA).	5. Weapons and combat vehicles.....	69.23
		6. Tactical and support vehicles.....	22.76
		8. Other support equipment.....	29.87
		10. Production-base support.....	9.54
Navy and Marine Corps.	Other procurement, Navy (OPN).	3-1950 Other support equipment.....	7.06
		4. Civil engineering support.....	11.80
	Procurement, Marine Corps (PMC).	5. Supply support equipment.....	2.09
		6-1110 Command support equipment.....	3.52
		1.B Artillery.....	1.44
		4. Support vehicles.....	.39
Air Force.....	Other procurement.....	5. Engineer and other equipment.....	.75
		2. Vehicular equipment.....	2.59
		4. Other base maintenance and support equipment.....	1.02
		-Industrial facilities.....	18.97
			7.41
			11.25
			.31

Methodology. General methodology is described at the beginning of this section. The material annex procurement lists^{9, 10, 12} for weapons, vehicles, and other support included such miscellaneous categories as spares and repair parts, survival equipment, and first destination transportation.

The miscellaneous categories were disaggregated into items that could be assigned SIC codes through the use of supporting data from the P-1 exhibits.^{31, 59} Other supporting data subsidiary to the P-1 exhibits were the Navy, fiscal year 1967 budget backup justification,³² which supplied information on OPN; the Air Force, fiscal year 1966-67 buy-budget, budget program 82, vehicular equipment,⁸¹ and the Air Force, fiscal year 1965-66 buy-budget, budget program 8500, other base maintenance and support equipment.⁸²

It was felt that, except for budget activity 10, production-base support, the Army procurement list provided sufficient detail to obviate further search for product detail because the sum of the Army miscellaneous and repair parts and support materiel TOA

constituted 10 percent of the Army's and 7 percent of the three services' weapons, vehicles, and other support budget. Also, Army's first destination transportation costs, which were 2 percent of the Army's and 1 percent of the three services' TOA for this group, were identified but not SIC coded because of lack of necessary information.

The procurement lists provided no detail for the Army's budget activity 10, production-base support, nor for the Air Force's budget activity, industrial facilities. With respect to Army's budget activity 10, production-base support, a sample of the product composition was derived from supporting documents for the *President's Budget: Fiscal year 1965*.⁸³ In addition, relevant data from this source were used to distribute the relatively small amount of TOA in the Air Force's budget activity, industrial facilities.

As noted previously, the above sources were used to disaggregate budget activities to end products. Other classified and unclassified documents, not elsewhere listed, that contained descriptions of the items or items of a similar nature, aided in determining the appropriate product code to be assigned. They are listed under "Additional References."

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ECONOMIC IMPACT OF DEFENSE PROGRAMS*

The economic impact of the defense budget may be broadly defined as the degree to which defense programs utilize scarce resources (labor, machines and material) at the national, state and local (labor market area) levels. Impact varies with the change in size and composition of the defense budget. In recent years, the budget has represented approximately 8 percent of the gross national product; however, this percentage increased during the Vietnam buildup in fiscal year 1966. The increase in defense expenditures represented approximately 12 percent of the increase in the gross national product for that period. Expressed in defense-generated employment, the increase represented approximately 25 percent of the increase in civilian labor force during fiscal year 1966. This was a sharp reversal of the trend exhibited from 1963 to June 1965 when concern over defense impact revolved around procurement cutbacks.

Because of the changing size and composition of the defense budget, DOD has initiated continuing studies to determine the economic impact of its spending on geographic areas and industries. Although information delineating the economic impact of the defense budget will not influence procurement decisions, it is desirable that DOD develop the information that will permit it and other Federal, State, and local agencies to take actions to alleviate the adverse consequences of shifts in defense procurement programs. At the industry level such statistics are useful not only to provide information on where the defense dollar goes and for what products, but to better assess future trends and resource demands of the defense budget.

DOD IMPACT STUDY

This article presents a summary of a DOD study prepared by the Economic Impact Studies Division with the assistance of Arnold Franseen, Israel Rubin, and Dr. Roger Riefler. Because of the need to protect military security and proprietary information, the data presented here are highly summarized and are largely statistical and descriptive in nature. The study was based on data collected from large defense contractors during 1966 under the economic information system (EIS) developed jointly by DOD and NASA. These data were supplemented by impact statistics developed from other sources.

EIS is one of several DOD projects designed to measure the economic impact of defense programs. It originated in 1961 as part of an effort to assess the economic impact of defense procurement on plants and communities.

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In May 1966 the Bureau of the Budget (BOB) gave approval to the semiannual contractor reporting requirements prescribed by EIS. BOB's approval followed extensive coordination with industry representatives by DOD and NASA officials.

Contractor reports under EIS consist of the plantwide economic report and the individual project economic report. The plantwide report provides data on total employment according to four major categories: DOD, NASA, other Government, and commercial. The individual project report provides data on employment, costs, cost distribution overtime, and contract information, and is prepared for each individual project (major weapon system or major element thereof) having 150 or more direct workers on the project. (See article, "Economic Information System Reports Approved by Bureau of the Budget," *Defense Industry Bulletin*, June 1966.)

Two EIS reports were submitted by approximately 400 plants during 1966. These reports contained actual data for the 6-month periods ending December 1965 and June 1966, respectively. Forecasts of firm business based on contracts were also reported.

The statistics presented in tables 1 through 13 in this article supplement and extend previously published data, such as the prime contracts awards data by State, compiled by the Office of the Assistant Secretary of Defense (Comptroller). (See *Defense Industry Bulletin*, October 1966.) Although this later statistical series is useful in measuring the geographical impact of defense procurement, it is indicative at best. As stated in these reports:

It is emphasized that data on prime contracts by state do not provide any direct indication as to the State in which the actual production work is done. For the majority of contracts with manufacturers, the data reflect the location of the plant where the product will be finally processed and assembled. If processing or assembly is to be performed in more than one plant of a prime contractor, the location shown is the plant where the largest dollar amount of work will take place. More important is the fact that the report refers to prime contracts only, and cannot in any way reflect the distribution of the very substantial amount of material and component fabrication and other subcontract work that may be done outside the state where final assembly or delivery takes place.

The EIS and the supplementary statistics presented in the aforementioned tables are designed to alleviate these shortcomings with respect to defense impact measurement by geographic area. This is accomplished by surveying and imputing defense-generated industrial employment to the plant level and aggregating by labor market area (standard metropolitan statistical areas or county), State, and Nation, as well as by defense product group.

Also, these EIS statistics on defense-generated industrial employment are more precise than contract awards data with respect to indicating the time of the impact. The latter are reported for the period of contract award whereas the EIS employment statistics generally are associated with the period in which the work was performed under the contracts.

Despite these refinements, the statistics presented have several limitations particularly with respect to the completeness of coverage of employment generated by defense at all contracting tiers, and to the timing of employment impacts. Furthermore, the indirect "multiplier" effects have not been developed in this study. Research is being conducted to alleviate these shortcomings. Meanwhile, the use of the data should be qualified by these limitations.

SCOPE OF STUDY

Table 1 presents a summary of total employment covered by this study and compares this coverage with the estimated total employment generated in the United States by defense obligations for fiscal year 1966. The fiscal year 1966 defense budget is estimated to generate a total U.S. employment (including military) of 5,600,000. It is estimated that this report covers 4,150,000, or 75 percent, of this total.

TABLE 1.—Coverage of estimated defense-generated employment in the United States, June 1966

Source (1)	Obligations, fiscal year 1966 (billions) (2)	Employment generated (millions)		Percent coverage, col. (4) divided by col. (3) (5)
		Estimated from col. 2 (3)	Covered by this report (4)	
Procurement including R. & D., etc.	\$40.3	¹ 2.80	1.35	48
EIS surveyed plants.....	-----	-----	(.85)	-----
Imputed to prime contracts.....	-----	-----	(.50)	-----
Pay:				
Civilian.....	7.2	1.00	1.00	100
Military.....	8.3	1.80	1.80	100
National Guard, Reserve, retired.....	2.4	(²)	(²)	(²)
Total.....	³ 58.2	⁴ 5.60	4.15	75

¹ Estimated by using Census Bureau's value added per worker. This gross measure accounts for total employment generated from mining operations through semifinished shapes and forms to finished products including transportation, etc.

² Not available.

³ Excludes approximately \$9 billion obligations for work outside the United States.

⁴ By adding the approximate 1.2 million defense-generated employees and military personnel located outside the United States, the total becomes 6.8 million. This latter number represents approximately 8.7 percent of an adjusted U.S. labor force of 78.6 million derived by adding military personnel in the United States and personnel outside the United States and by deducting the unemployed. Although the 8.7 percent is not inconsistent with the approximate 8 percent of the gross national product devoted to defense, it should be recognized that several items may influence the accuracy of the estimate such as the use of the gross value added per worker factor mentioned in footnote 1 and possible differences in the labor intensity of items procured for defense.

Employment measured in this study is referred to as defense-generated employment and military personnel. The former consists of defense-generated industrial employment in the non-Government economy and DOD civil service employment.

Complete coverage of DOD civil service and military personnel by geographical assignment is accomplished by this study. Of the estimated 2,800,000 defense-generated industrial employees resulting from defense purchases in the civilian economy, including all "indirect" workers generated by subcontracts and vendors purchases, this study covers an estimated 48 percent, or 1,350,000, by geographical area. Coverage in this latter category is subdivided into two subgroups: the 850,000 defense-generated industrial workers employed by the 387 large defense plants surveyed by EIS and the 500,000 workers imputed, using census workers per shipment ratios, to the approximately 17,000 other plants, receiving prime contract awards. These 1,350,000 workers generated by defense procurement are estimated to account for 100 percent of those working on prime contracts and approximately 10 percent of the total indirect employment resulting from these primes. (See table 7.)

Tables 2 and 3 show the size distribution of plants in the EIS and imputed subgroups, respectively.

TABLE 2.—*Concentration of defense-generated industrial employment among EIS plants, June 1966*

Plant size classes (defense employment) (1)	EIS-surveyed plants		Defense-generated industrial employment	
	Number (2)	Cumulative percent (3)	Number (thousands) (4)	Cumulative percent (5)
10,000 and over.....	16	4.1	251.8	29.6
6,000 to 9,999.....	16	8.3	121.0	43.8
5,000 to 5,999.....	11	11.1	61.2	51.0
4,000 to 4,999.....	12	14.2	52.6	57.2
3,000 to 3,999.....	18	18.9	60.8	64.3
2,000 to 2,999.....	47	31.0	113.3	77.6
1,000 to 1,999.....	75	50.4	99.6	89.3
Under 1,000.....	192	100.0	90.9	100.0
Total.....	387		851.2	

¹ The EIS survey included 422 plants, 35 of which were NASA plants exclusively.

TABLE 3.—*Concentration of defense-generated industrial employment among prime plants (not surveyed by EIS), June 1966*¹

Plant size classes (defense employment) ² (1)	Prime plants ³		Defense-generated employment	
	Number (2)	Cumulative percent (3)	Number (thousands) (4)	Cumulative percent (5)
400 and over.....	104	0.6	102.2	29.6
300 to 399.....	69	1.0	23.4	36.3
200 to 299.....	151	1.9	36.5	46.8
100 to 199.....	401	4.2	56.3	63.1
0 to 99.....	16,582	100.0	127.9	100.0
Total.....	17,307		346.3	
Undistributed.....			154.7	
Total.....			501.0	

¹ Employment for June 1966 was imputed to prime contract awards during calendar year 1965, and the results "lagged" 6 months.

² Indicates the number of defense-generated industrial workers imputed to a prime contractor plant.

³ The number of defense plants is a count of prime contractors who supplied manufactured products. It excludes construction contractors and those providing services such as air transportation communications, and equipment-leasing services.

⁴ Undistributed consists of defense-generated employment imputed to the excluded contracts noted in footnote 3.

Defense impact on the economy can be assessed in both a static and dynamic way. The static or point-in-time estimate of defense impact focuses on the geographic concentration of defense-employed resources and the dependency of an area on defense employment. Tables 4 to 9 illustrate this dimension of defense impact at the State, labor market area, and defense product group levels. The dynamic or trend element of defense impact is concerned with issues such as: Is DOD's utilization of economic resources increasing or decreasing? At what rate and in what areas? The final four tables, tables 10 to 13, present the relevant data for an assessment of this dimension of impact at the State and defense product group levels.

CONCENTRATION OF DEFENSE-GENERATED EMPLOYMENT

Table 4 presents the State distribution of defense-generated employment, military personnel and the total civilian labor force both in absolute terms (cols. 7 to 9) and percentage terms (cols. 2 to 4). Column 5 contains an index expressing the relative concentration of defense-generated employment. An entry of one in this column signifies that the State has the same percent of the U.S. defense-generated employment and the U.S. labor force; an entry greater than one signifies a higher percentage of total defense employment than indicated by the labor force share. California and New York illustrate extremes. The former's share of defense employment is almost twice its percent of the U.S. labor force; New York has a reverse relationship.

Ten States have a significantly greater share of the U.S. defense employment than indicated by their share of the U.S. labor force; 17 have a significantly smaller share.

The 12 Midwestern States, except Kansas and Missouri, have a significantly smaller share of defense employment than their share of the U.S. labor force.

Column 6 presents the relative concentration of the combined total of defense-generated employment and military personnel as measured against the total work force plus military personnel. A comparison of the indexes in column 6 with column 5 shows a shift from less than one to more than one for those States having relatively large military populations, notably North Carolina, South Carolina, and Kentucky.

TABLE 4.—Distribution of defense employment and labor force by State, June 1966

State ranking ¹	Percentage distribution			Index of relative concentration		Number (thousands)		
	Defense-generated employment ²	Labor force	Military personnel	Defense-generated employment col. (2) divided by col. (3)	Defense-generated employment and military personnel ³	Defense-generated employment	Labor force	Military personnel
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. California.....	17.0	9.5	13.5	1.8	1.6	405.0	7,459.0	246.6
2. Texas.....	5.8	5.1	11.3	1.1	1.6	139.6	4,024.6	206.9
3. New York.....	5.7	10.1	1.8	.6	.4	138.0	7,965.0	33.2
4. Pennsylvania.....	5.4	6.0	.8	.9	.6	129.8	4,747.3	14.9
5. Virginia.....	5.2	2.1	3.6	2.4	2.1	125.6	1,638.6	66.3
6. Ohio.....	3.7	5.3	1.1	.7	.5	88.7	4,153.3	19.8
7. Maryland.....	3.6	1.7	2.6	2.1	1.8	85.3	1,307.3	47.5
8. Massachusetts.....	3.6	3.1	1.5	1.1	.8	85.2	2,432.1	28.2
9. New Jersey.....	3.4	3.5	2.7	1.0	.9	80.3	2,753.7	48.8
10. Connecticut.....	3.3	1.6	.2	2.1	1.3	78.9	1,236.8	4.2
11. Florida.....	3.0	2.9	3.8	1.0	1.2	73.3	2,264.3	69.2
12. Missouri.....	2.9	2.5	2.1	1.2	1.0	69.8	1,965.9	38.0
13. Georgia.....	2.9	2.1	6.0	1.4	1.9	69.2	1,684.9	109.4
14. Illinois.....	2.5	6.0	3.3	.4	.5	60.3	4,730.0	60.3
15. Washington.....	2.2	1.5	2.6	1.5	1.4	51.5	1,217.7	47.6
16. Alabama.....	2.0	1.6	1.7	1.2	1.2	48.1	1,273.1	32.1
17. Indiana.....	1.8	2.6	.5	.7	.5	43.6	2,019.5	9.8
18. Oklahoma.....	1.6	1.2	2.1	1.3	1.5	38.6	961.2	37.9
19. Michigan.....	1.5	4.1	1.0	.4	.3	36.0	3,187.9	18.3
20. Utah.....	1.5	.5	.2	3.0	2.0	35.7	390.5	4.5
21. District of Columbia.....	1.4	.5	3.9	2.8	4.0	32.8	396.0	70.5
22. Tennessee.....	1.3	2.0	1.2	.7	.6	29.9	1,584.5	21.9
23. North Carolina.....	1.2	2.5	5.1	.5	1.1	29.1	1,994.0	92.7
24. Colorado.....	1.1	1.0	2.2	1.1	1.5	25.6	778.8	40.5
25. Kansas.....	1.1	1.1	1.9	1.0	1.3	25.6	834.6	34.8
26. Mississippi.....	1.0	1.0	1.5	1.0	1.2	23.9	786.3	28.0
27. South Carolina.....	1.0	1.3	3.3	.8	1.5	23.2	998.8	60.2
28. Hawaii.....	1.0	.3	1.6	3.3	3.0	22.8	273.3	28.7
29. Minnesota.....	.9	2.0	.3	.5	.3	21.5	1,591.3	5.1
30. Arizona.....	.8	.7	1.1	1.1	1.4	19.3	544.5	20.7
31. Kentucky.....	.7	1.4	2.8	.5	1.1	16.7	1,126.2	51.9
32. New Mexico.....	.6	.5	1.0	1.2	1.6	15.1	357.4	18.7
33. Louisiana.....	.6	1.6	2.2	.4	.8	14.6	1,302.5	40.1
34. Wisconsin.....	.6	2.3	.2	.3	.2	14.6	1,787.5	3.4
35. Rhode Island.....	.6	.5	.5	1.2	1.2	13.8	372.3	9.5
36. New Hampshire.....	.6	.3	.3	2.0	1.3	13.5	274.0	5.2
37. Iowa.....	.4	1.5	.1	.3	.2	9.9	1,194.9	1.6
38. Alaska.....	.4	.1	1.6	4.0	9.0	8.8	90.4	29.2
39. Arkansas.....	.3	.9	.5	.3	.4	8.1	685.4	9.2
40. Maine.....	.3	.5	.5	.6	.8	7.2	375.4	10.8
41. Oregon.....	.3	1.1	.2	.3	.2	6.6	826.4	3.6
42. Nebraska.....	.3	.8	.7	.4	.6	6.5	650.0	12.4
43. West Virginia.....	.3	.8	.0	.4	.2	6.4	620.9	.5
44. North Dakota.....	.2	.3	.7	.7	1.3	4.2	267.7	12.2
45. Nevada.....	.1	.2	.3	.5	1.0	3.3	189.9	6.3
46. Delaware.....	.1	.3	.4	.3	.7	3.0	226.7	7.1
47. Vermont.....	.1	.2	.0	.5	.5	2.6	166.5	.3
48. South Dakota.....	.1	.3	.3	.3	.7	1.9	262.9	6.2
49. Montana.....	.1	.4	.5	.3	.9	1.7	263.7	9.4
50. Wyoming.....	.0	.2	.2	0	.5	1.3	144.6	4.0
51. Idaho.....	.0	.3	.2	0	.3	.9	277.9	4.0
Undistributed.....	3.9		2.2			90.4		39.4
Total.....	100.0	100.0	100.0			2,387.3	78,658.0	1,832.5

¹ Arranged in descending order based on State's percent of defense-generated employment.

² Includes defense-generated employment in 387 EIS plants, all other prime plants and civil service employment at DOD installation.

³ Percent distribution of total of defense-generated employment (col. 7) plus military personnel (col. 9) divided by percent distribution of total of labor force (col. 8) plus military personnel (col. 9).

Closely allied to the index of relative concentration is the concept of defense dependency, which may be defined as defense-generated employment as a percent of the civilian labor force. The average defense dependency of the United States, as shown in table 5, is 3 percent; 22 States and the District of Columbia equal or exceed this figure. A common attribute of the top six entries on this list is the significance of civilians hired by military installations ranging from 53.5 percent of total defense-generated employment in Maryland to over 90 percent in Hawaii.

TABLE 5.—Defense dependency by State, June 1966

[Employment numbers in thousands]

State ranking :	Work force	Defense-generated employment	Percent defense dependency, col. 3 divided by col. 2
(1)	(2)	(3)	(4)
1. Alaska.....	90.4	8.8	9.7
2. Utah.....	390.5	35.7	9.1
3. Hawaii.....	273.3	22.8	8.3
4. District of Columbia.....	396.0	32.8	8.3
5. Virginia.....	1,638.6	125.6	7.7
6. Maryland.....	1,307.3	85.3	6.5
7. Connecticut.....	1,236.8	78.9	6.4
8. California.....	7,459.0	405.0	5.4
9. New Hampshire.....	274.0	13.5	4.9
10. Washington.....	1,217.7	51.5	4.2
11. New Mexico.....	357.4	15.1	4.2
12. Georgia.....	1,684.9	69.2	4.1
13. Oklahoma.....	861.2	38.6	4.0
14. Alabama.....	1,273.1	48.1	3.8
15. Rhode Island.....	372.3	13.8	3.7
16. Missouri.....	1,965.9	69.8	3.6
17. Texas.....	4,024.6	139.6	3.5
18. Massachusetts.....	2,432.1	85.2	3.5
19. Arizona.....	544.4	19.3	3.5
20. Colorado.....	778.8	25.6	3.3
21. Florida.....	2,264.3	73.3	3.2
22. Kansas.....	834.6	25.6	3.1
23. Mississippi.....	786.3	23.9	3.0
U.S. average.....			3.0
24. New Jersey.....	2,753.7	80.3	2.9
25. Pennsylvania.....	4,747.3	129.8	2.7
26. South Carolina.....	898.8	23.2	2.3
27. Indiana.....	2,019.5	43.6	2.2
28. Ohio.....	4,153.3	88.7	2.1
29. Tennessee.....	1,584.5	29.9	1.9
30. Maine.....	375.4	7.2	1.9
31. New York.....	7,965.0	138.0	1.7
32. Nevada.....	189.9	3.3	1.7
33. North Dakota.....	267.7	4.2	1.6
34. Vermont.....	166.5	2.6	1.6
35. Kentucky.....	1,126.2	16.7	1.5
36. North Carolina.....	1,994.0	29.1	1.5
37. Minnesota.....	1,591.3	21.5	1.4
38. Illinois.....	4,730.0	60.3	1.3
39. Delaware.....	226.7	3.0	1.3
40. Arkansas.....	685.4	8.1	1.2
41. Michigan.....	3,187.9	36.0	1.1
42. Louisiana.....	1,302.5	14.6	1.1
43. Nebraska.....	650.0	6.5	1.0
44. West Virginia.....	620.9	6.4	1.0
45. Wyoming.....	144.6	1.3	.9
46. Oregon.....	826.4	6.6	.8
47. Iowa.....	1,194.9	9.9	.8
48. Wisconsin.....	1,787.5	14.6	.8
49. South Dakota.....	262.9	1.9	.7
50. Montana.....	263.7	1.7	.6
51. Idaho.....	277.7	.9	.3
Undistributed.....		90.4	
Total, United States.....	78,658.0	2,387.3	3.0

1 Arranged in descending order based on percent defense dependency.

Defense dependency was examined for 292 labor market areas in which there were more than 500 defense-generated workers, or in which the defense dependency rate exceeded five percent. Tables 5(a) and 5(b) summarize the characteristics of those areas with respect to the dominant cause of defense dependency and the size of the area labor force.

Table 5(a) presents the distribution of these 292 labor market areas by defense dependency class intervals and identifies the dominant cause of dependency. If an area's defense employment is 50 percent or more attributable to a military installation or any one product as listed in columns (b) through (g), it is distributed under that column. Of the 292 areas, 129 derived their dependency from military installations and 106 were undistributed under this "dominance" criterion. Of the latter, 64 fall below the 3 percent U.S. average defense dependency ratio. These 64 may be relatively immune to defense impact since they have a low dependency rate and a diversified defense activity base.

Sixteen of the 25 areas in the defense dependency class interval of "15 percent or more" are attributed to the location of military installations and four to commercial shipyards.

TABLE 5(a).—Area distribution by dependency class and type of employment, June 1966

Defense dependency classes (a)	Areas by dominant type of employment						Labor areas	
	Military installations (b)	Aircraft (c)	Missile and space (d)	Ammunition (e)	Ships (f)	Undistributed (g)	Total (h)	Cumulative percent (i)
15 percent and over.....	16	-----	2	1	4	2	25	8
12 to 14.9 percent.....	13	-----	-----	2	-----	2	17	14
9 to 11.9 percent.....	14	4	2	3	1	7	31	25
6 to 8.9 percent.....	23	-----	1	3	-----	8	35	37
3 to 5.9 percent.....	33	5	4	2	1	23	68	60
Under 3 percent.....	30	9	3	9	1	64	116	110
Total.....	129	18	12	20	7	106	292	-----

Table 5(b) presents the distribution of the 292 areas by labor force size groups using the same dependency class intervals. Of the 292 areas, 183, or 60 percent, have a labor force of less than 100,000 workers; 69 have less than 25,000 workers.

The areas with the highest defense dependency rates tend to be associated with the smallest communities (and have a high dependency on military installations). Nineteen of the 25 areas in the "15 percent or more" class have a labor force of less than 50,000.

By contrast the areas with the lowest dependency rates tend to be associated with the largest areas. Of the 116 locations having less than 3 percent dependency, 92 are in areas having a labor force of 50,000 or more. However if a more complete measure of impact could be obtained by tracing lower tier subcontracting and purchases of goods and services, it may be found that the larger areas with a broader industrial base retain more of this secondary impact than the smaller areas.

Column (c) in table 5(b) also shows that 41.6 percent of defense-generated employment in this study is located in 108 areas having a dependency of "6 percent or more" which is twice the 3 percent U.S. average.

TABLE 5(b).—Area distribution by dependency class and labor force size, June 1966

Defense dependency classes (a)	Defense employment		Labor force size groups (thousand)							No. of Areas (k)
	No. (thousands) (b)	Cumulative percent (c)	Under 25 (d)	25 to 50 (e)	50 to 100 (f)	100 to 250 (g)	250 to 500 (h)	500 to 1,000 (i)	Over 1,000 (j)	
15 percent and over.....	207	8.7	15	4	4	2	-----	-----	-----	25
12 to 14.9 percent.....	124	13.9	7	5	3	1	-----	-----	-----	17
9 to 11.9 percent.....	427	31.8	14	4	-----	5	7	-----	-----	31
6 to 8.9 percent.....	236	41.6	10	12	6	3	3	1	1	35
3 to 5.9 percent.....	690	70.5	20	12	13	10	4	5	4	68
Under 3 percent.....	703	100.0	3	21	30	37	13	9	3	116
Total.....	2,387	-----	69	58	56	58	28	15	8	292

Table 6, using the smaller sample of 851,200 EIS-surveyed workers at 387 plants, presents the percentage distribution for this employment both by state and defense product group. The percentage distribution of the total labor force is presented for comparative purposes.

TABLE 6.—Percentage distribution of EIS-surveyed defense employment by State and product group, June 1966

Region and States (a)	Defense product groups									Total labor force (k)	
	Aircraft (b)	Missiles and space (c)	Ships (d)	Vehicles and weapons (e)	Ammunition (f)	Electronics and communications (g)	R.D.T. & E. (h)	Other (i)	Total (j)		
New England:											
Maine.....			3.8	5.8		1.4			0.4	0.5	
New Hampshire.....				10.3					.4	.3	
Vermont.....	2.4	5.7	9.9	.9		8.4	6.0	15.3	5.1	3.1	
Massachusetts.....					0.6	.4			.2	.5	
Rhode Island.....				7.6	2.9	2.0			7.8	1.6	
Connecticut.....	14.2		23.1								
Subtotal.....	16.6	5.7	36.8	24.6	3.5	12.1	6.0	15.3	14.1	6.2	
Middle Atlantic:											
New York.....	8.2			.9	2.5	14.0	8.7	4.2	7.2	10.1	
New Jersey.....	1.7	3.2	.9		.6	7.0	.9	1.7	3.9	3.5	
Pennsylvania.....	3.8	1.0		6.7	4.6	8.3		.8	3.6	6.0	
Subtotal.....	13.8	4.1	.9	7.6	7.7	29.3	9.6	6.7	14.7	19.6	
East north central:											
Ohio.....	8.4		.8	7.6	2.5	.4		2.5	3.6	5.3	
Indiana.....	3.2	.6		4.5	9.6	1.6			2.5	2.6	
Illinois.....	.5				3.9	2.0	3.5	10.2	1.2	6.0	
Michigan.....	.5	1.3	1.7	22.9		2.0			1.6	4.1	
Wisconsin.....			1.2		3.5	1.0			.6	2.3	
Subtotal.....	12.6	1.9	3.7	35.0	19.5	7.0	3.5	12.6	9.5	20.3	
West north central:											
Minnesota.....				9.4	8.6	3.3			1.9	2.0	
Iowa.....					4.1	2.2			.9	1.5	
Missouri.....	10.4	.7			12.8	.6			5.1	2.5	
Nebraska.....					1.8				.2	.8	
Kansas.....	4.9				4.5				2.2	1.1	
Subtotal.....	15.3	.7	0	9.4	31.8	6.1	0	0	10.3	18.5	

South Atlantic:											
Delaware.....	.2								.1	.3	
Maryland.....	.1	6.8	2.3		.3	6.5			2.8	1.7	
District of Columbia.....									0	.5	
Virginia.....		3.7	25.8			1.1	10.4		3.0	2.1	
West Virginia.....		.7		11.2					.4	.8	
North Carolina.....		.2				2.7		4.2	.8	2.5	
Georgia.....	7.1				1.5				2.6	2.1	
Florida.....	3.0	7.1				1.6	1.7	9.3	2.7	2.9	
Subtotal.....	10.4	18.5	28.1	11.2	1.8	11.9	12.1	13.5	12.4	14.2	
East south central:											
Tennessee.....	1.0	.7			11.8			4.2	1.5	2.0	
Alabama.....	1.7	.7	1.8		.8				.9	1.6	
Mississippi.....	.2		8.7						.8	1.0	
Subtotal.....	2.9	1.4	10.5	0	12.7	0	0	4.2	3.3	16.0	
West south central:											
Arkansas.....					.8			1.7	.1	.9	
Louisiana.....	.4		1.5		3.4				.5	1.6	
Oklahoma.....	1.1	.4				.1			.5	1.2	
Texas.....	10.6	.8			9.8	3.7		4.2	5.8	5.1	
Subtotal.....	12.1	1.2	1.6	0	14.0	3.8	0	5.9	6.8	8.8	
Mountain:											
Colorado.....	.3	4.3							.8	1.0	
Arizona.....	.7	2.3			.4	1.0			.9	.7	
Utah.....		5.1							.8	.5	
Subtotal.....	1.0	11.6	0	0	.4	1.0	0	0	2.6	13.8	
Pacific:											
Washington.....	.5	12.4	7.3	.9					2.7	1.5	
Oregon.....			2.3						.2	1.1	
California.....	15.1	42.6	8.9	11.2	8.5	28.6	68.7	41.5	23.0	9.5	
Subtotal.....	15.6	55.0	18.4	12.1	8.5	28.6	68.7	41.5	26.0	12.1	
U.S. total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
EIS-surveyed defense employment (thousands).....	304.5	136.4	65.5	22.3	71.1	228.1	11.5	11.8	851.2		

¹ Does not add due to exclusion of States not represented in EIS survey. May not add due to rounding.

The Pacific region with 26 percent of the EIS-surveyed workers, but only 12.1 percent of the work force, far outranks the next highest regions, i.e., mid-Atlantic and New England with 14.7 and 14.1 percent, respectively. One unique characteristic of the Pacific region is its significant participation in each product group.

California, with 23 percent of the EIS-surveyed workers and 9.5 percent of the labor force, is the dominant State both in total EIS-surveyed workers and for several of the defense product groups. It far outranks Connecticut and New York which have 7.8 and 7.2 percent, respectively, of the total EIS-surveyed employment.

The largest product group, in terms of EIS-surveyed employment, is aircraft with 304,000 workers, or 36 percent, of the total of 851,000 workers. Employment in the aircraft program is rather evenly dispersed; it ranges between 10 and 16 percent in all regions except for mountain and east south central regions, which combined represent only 3.9 percent of the total.

Employment in the electronics and communications product group, which accounts for 27 percent of total EIS-surveyed employment, is concentrated in the middle Atlantic and Pacific regions; each of these two regions account for approximately 29 percent of the total employment in this product group.

Regional concentrations for the remaining six product groups, accounting for the residual 37 percent of EIS-surveyed employment, varies greatly. Ammunition is produced in all nine regions. However, two of these regions, east north central and west north central, account for over half of the EIS-surveyed employment on this product.

Table 7 delineates the State distribution of the 146,000 workers employed on defense subcontracts in plants surveyed by the EIS. It should be explicitly noted that, since the EIS survey was designed to include large defense prime contractors, the subcontracting dispersion shown in table 7 may be somewhat biased. For example, Kansas, a State in which the EIS sample encompassed a relatively high percent of total defense-oriented industries' employment, may rank relatively high while Illinois, where EIS coverage is relatively small, may rank relatively low because of an understatement of subcontracting.

TABLE 7.—EIS-surveyed employment generated by defense subcontracts by State of performance, June 1966

State ranking	Number (thousands)	Percentage	State ranking	Number (thousands)	Percentage
1. California.....	37.8	25.9	20. Missouri.....	1.5	1.0
2. New York.....	20.9	14.3	21. Iowa.....	1.1	.8
3. Massachusetts.....	9.4	6.4	22. West Virginia.....	.8	.6
4. New Jersey.....	9.0	6.2	23. Georgia.....	.7	.5
5. Connecticut.....	7.6	5.2	24. Colorado.....	.6	.4
6. Texas.....	6.7	4.6	25. Maine.....	.6	.4
7. Ohio.....	6.4	4.4	26. North Carolina.....	.5	.3
8. Florida.....	5.4	3.7	27. Louisiana.....	.5	.3
9. Kansas.....	4.8	3.3	28. Oklahoma.....	.4	.3
10. Indiana.....	4.7	3.2	29. Alabama.....	.4	.3
11. Pennsylvania.....	4.1	2.8	30. Mississippi.....	.4	.3
12. Tennessee.....	3.9	2.7	31. Vermont.....	.2	.1
13. Michigan.....	3.4	2.3	32. Washington.....	.2	.1
14. Maryland.....	2.9	2.0	33. Wyoming.....	.2	.1
15. Minnesota.....	2.7	1.9	34. Wisconsin.....	.2	.1
16. Arizona.....	2.3	1.6	35. Delaware.....	.0	.0
17. Utah.....	2.2	1.5	Other 15 States.....	.1	.1
18. Illinois.....	1.8	1.2			
19. Virginia.....	1.6	1.1			
			Total.....	146.0	100.0

To better evaluate this inherent bias, table 8 presents data showing the distribution of subcontracts awarded to the top 10 States as determined by a special study conducted by the Office of the Assistant Secretary of Defense (Systems Analysis). The subcontracting data collected for that study was less biased than the EIS-surveyed data. It can be seen that, although there are significant differences between the two studies, eight of the top 10 appear on both lists.

TABLE 8.—10 top States ranked by defense prime and subcontracts

State (a)	Special defense subcontract study ¹		Subcontracts in EIS plants ²		Defense prime contracts			
	Rank (b)	Percent of United States (c)	Rank (d)	Percent of United States (e)	Awards ³		Employment ⁴	
					Rank (f)	Percent of United States (g)	Rank (h)	Percent of United States (i)
California	1	30.2	1	25.9	1	22.1	1	18.6
New York	2	11.5	2	14.3	2	9.6	2	7.3
New Jersey	3	7.0	4	6.2	9	3.5	9	3.8
Ohio	4	6.0	7	4.4	8	3.7	6	4.8
Connecticut	5	5.6	5	5.2	4	5.1	3	6.0
Pennsylvania	6	5.1	11	2.8	7	4.2	5	4.8
Massachusetts	7	4.2	3	6.4	5	5.1	7	4.7
Florida	8	2.9	8	3.7	11	2.7	10	3.6
Texas	9	2.9	6	4.6	3	6.2	4	5.6
Illinois	10	2.8	18	1.2	17	1.8	13	2.6
Subtotal		78.2		74.6		64.0		61.8
Others		21.8		25.3		36.0		38.2
Total		100.0		100.0		100.0		100.0

¹ Based on dollars of subcontract awards received.

² Based on June 1966 employment generated by defense subcontracts received by EIS plants.

³ Based on prime contract awards in fiscal year 1965.

⁴ Employment on prime contracts as reported by EIS plants.

This table also presents for comparative purposes an employment and awards series for prime contracts in these same 10 States. The first series, prime contract awards, is published by the Office of the Assistant Secretary of Defense (Comptroller), while the second is derived from the EIS survey of prime contract employment. Comparing all four rankings (two for prime contracts, two for subcontracts), it is noted that eight of the top 10 States, as ranked by the DOD special subcontracting study, appear in all series. This suggests that subcontracting work is more concentrated geographically than prime contracts. Each of the prime contract series indicates that approximately 65 percent of all work is done in the top 10 States while, for subcontracting, the 10 top States account for 77 or 78 percent of all work.

As a summary of State distribution of defense impact, table 9 presents the top 10 States ranked by nine separate impact measures. The concentrated nature of defense impact is demonstrated by the fact that only 19 States appear in this table, and four of the 19 (California, New York, Texas, and Ohio) appear in all nine columns.

TABLE 9.—Top 10 States ranked by defense impact measures

Rank (1)	Prime contracts			Subcontracts			Total EIS employment, primes and subcontracts (3+6) (8)	Civilian employment at installations ⁶ (9)	Total defense generated employment (8+9) (10)
	Awards fiscal year 1965 ¹ (2)	EIS employment ² (3)	Census shipments (MA 175) ³ (4)	Awards per DOD study ⁴ (5)	EIS employment ⁵ (6)	Census shipments (MA 175) ³ (7)			
1	California.....	California.....	California.....	California.....	California.....	California.....	California.....	California.....	California.....
2	New York.....	New York.....	New York.....	New York.....	New York.....	New York.....	New York.....	Virginia.....	Texas.....
3	Texas.....	Connecticut.....	Connecticut.....	New Jersey.....	Massachusetts.....	New Jersey.....	Connecticut.....	Pennsylvania.....	New York.....
4	Connecticut.....	Texas.....	Ohio.....	Ohio.....	New Jersey.....	Ohio.....	Texas.....	Texas.....	Pennsylvania.....
5	Massachusetts.....	Pennsylvania.....	New Jersey.....	Connecticut.....	Connecticut.....	Connecticut.....	Massachusetts.....	Maryland.....	Virginia.....
6	Missouri.....	Ohio.....	Massachusetts.....	Pennsylvania.....	Texas.....	Massachusetts.....	Ohio.....	Georgia.....	Ohio.....
7	Pennsylvania.....	Massachusetts.....	Missouri.....	Massachusetts.....	Ohio.....	Pennsylvania.....	Pennsylvania.....	Ohio.....	Maryland.....
8	Ohio.....	Missouri.....	Texas.....	Florida.....	Florida.....	Indiana.....	New Jersey.....	New York.....	Massachusetts.....
9	New Jersey.....	New Jersey.....	Pennsylvania.....	Texas.....	Kansas.....	Illinois.....	Missouri.....	Alabama.....	Connecticut.....
10	Georgia.....	Florida.....	Washington.....	Illinois.....	Indiana.....	Texas.....	Florida.....	Oklahoma.....	New Jersey.....

¹ OSD Comptroller, fiscal year 1965: Data for fiscal year 1965 is considered more comparable to EIS employment data than the fiscal year 1966 awards data.

² Prime contract portion of EIS surveyed and nonsurveyed prime contract generated employment June 1966.

³ Census MA-175, calendar year 1963.

⁴ Special defense subcontract study, 1966.

⁵ Subcontract portion of EIS survey, June 1966

⁶ OSD Comptroller, June 1966.

CHANGES IN DEFENSE-GENERATED EMPLOYMENT

Between June 1965 and June 1966 defense-generated employment increased by 17 percent as shown in table 10. Of the three components, employment imputed to prime contracts accounted for the largest relative (39 percent) and absolute increase in defense-generated employment. Plants comprising this component generally devote most of their output to commercial-type items such as construction equipment, medical and dental equipment, photographic equipment and supplies, material handling equipment, food, clothing, etc.

TABLE 10.—*Defense-generated employment, June 1965–June 1966*

Components	Employment (thousands)			Percent increase, June 1965 to June 1966	Percent of total employment increase, June 1965 to June 1966
	June 1965	December 1965	June 1966		
EIS-surveyed plants.....	733	774	851	16	33.8
Imputed to prime contracts.....	1 361	408	501	39	39.6
DOD civilians.....	941	983	1,035	10	26.6
Total.....	2,035	2,170	2,387	17	100.0

¹ Based on contract awards for the 6 months, July–December 1964, converted to an annual basis.

Employment in the EIS plants (working primarily on specialized defense products) increased by 16 percent. The largest aggregate increases were in aircraft and ammunition programs as shown in table 11. Defense employment in the aircraft plants increased by 41,000, or 16 percent. The 39,000 increase in employment in the ammunition group represented more than 100-percent increase over 1965.

TABLE 11.—*EIS-surveyed employment changes by product group, June 1965 to June 1966*

[In thousands]

Defense product group	June 1965	December 1965	June 1966
Aircraft.....	263	280	304
Missiles and space.....	126	128	136
Ships.....	63	63	66
Vehicles and weapons.....	19	18	22
Ammunition.....	32	46	71
Electronics and communications.....	209	219	228
All others surveyed.....	21	21	24
Total.....	733	774	851

The geographic distribution of changes in defense-generated employment between June 1965 and June 1966 are delineated by table 12. The total change in defense-generated employment is presented in column 5, while columns 3 and 4 identify the portions of change associated with plants and DOD installations, respectively. Also included in column 6 is the geographic distribution of changes in military personnel.

The nine States indicated by an asterisk accounted for 52 percent of the 353,900 increase in defense-generated employment. Except for Missouri, Connecticut, and Illinois, these nine States also rank

among the States having the largest number of defense workers as of June 1966. Missouri and Connecticut experienced large employment increases in both EIS-surveyed and nonsurveyed plants, while Illinois' increase was predominantly in imputed employment to nonsurveyed plants.

Excluded from these nine States are the large defense-producing States of New York, Ohio, and Massachusetts.

TABLE 12.—Changes in defense generated employment by State, June 1965–June 1966

[In thousands]

State	Defense generated employment ¹		Net changes in employment, June 1965–June 1966				
	June 1965	June 1966	Defense civilian employment			Military personnel assigned	Total defense-generated and military, col. (5)+col. (6)
			EIS and all other plants	DOD installations	Total, col. (3)+col. (4)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Alabama.....	47.2	48.1	1.0	-0.1	0.9	8.1	9.0
Alaska.....	8.8	8.8	-3	.3	0	-1.7	-1.7
Arizona.....	14.9	19.3	3.6	.8	4.4	-5	3.9
Arkansas.....	5.4	8.1	2.2	.5	2.7	-7	2.0
California ²	349.1	405.0	36.4	19.5	55.9	33.7	89.6
Colorado.....	24.2	25.6	.2	1.2	1.4	5.1	6.5
Connecticut ²	66.3	78.9	12.1	.5	12.6	.5	13.1
Delaware.....	2.1	3.0	.8	.1	.9	.1	.8
District of Columbia.....	33.2	32.8	-7	.2	-5	5.7	5.2
Florida.....	68.2	73.3	2.6	2.5	5.1	.8	4.3
Georgia.....	58.3	69.2	4.6	6.3	10.9	15.4	26.3
Hawaii.....	20.8	22.8	.2	1.8	2.0	11.5	-9.5
Idaho.....	.6	.9	.2	.1	.3	-1.4	-1.1
Illinois ²	47.9	60.4	11.1	1.4	12.5	12.9	25.4
Indiana.....	34.5	43.6	6.7	2.4	9.1	1.3	10.4
Iowa.....	7.3	9.9	2.4	.2	2.6	.2	2.8
Kansas.....	19.2	25.6	5.6	.8	6.4	5.0	11.4
Kentucky.....	13.2	16.7	.3	3.2	3.5	3.0	6.5
Louisiana.....	10.5	14.6	2.9	1.2	4.1	5.8	9.9
Maine.....	5.6	7.2	1.5	.1	1.6	-1.4	.2
Maryland.....	69.3	85.3	11.5	4.5	16.0	8.2	24.2
Massachusetts.....	78.7	85.2	6.4	.1	6.5	-2.3	4.2
Michigan.....	29.7	36.0	5.2	1.1	6.3	-1.6	4.7
Minnesota.....	16.2	21.5	5.1	.2	5.3	-1	5.2
Mississippi.....	23.2	23.9	-5	1.2	.7	6.7	7.4
Missouri ²	53.6	69.8	12.7	3.5	16.2	10.3	26.5
Montana.....	1.5	1.7	0	.2	.2	-1	.1
Nebraska.....	5.1	6.5	1.7	-3	1.4	-4.0	-2.6
Nevada.....	3.0	3.3	.2	.1	.3	-1.3	-1.0
New Hampshire.....	12.1	13.5	1.1	.3	1.4	-2.5	-1.1
New Jersey ²	67.5	80.3	9.6	3.2	12.8	11.9	24.7
New Mexico.....	15.3	15.1	-1.0	.8	-2	-2.9	-3.1
New York.....	130.2	138.0	17.0	-9.2	7.8	-1.9	5.9
North Carolina.....	25.9	29.1	2.1	1.1	3.2	5.9	9.1
North Dakota.....	2.7	4.2	1.7	-2	1.5	-1	1.4
Ohio.....	80.1	88.7	7.6	1.0	8.6	1.1	9.7
Oklahoma.....	31.2	38.6	1.6	5.8	7.4	3.9	11.3
Oregon.....	5.5	6.6	1.0	.1	1.1	-1.4	-3
Pennsylvania ²	108.0	129.8	16.8	5.0	21.8	-7	21.1
Rhode Island.....	13.5	13.8	-2	.5	.3	2.9	3.2
South Carolina.....	18.7	23.2	2.1	2.4	4.5	10.0	14.5
South Dakota.....	2.1	1.9	-2	0	-2	-4	-6
Tennessee.....	23.1	29.9	6.3	.5	6.8	3.5	10.3
Texas ²	116.7	139.6	13.0	9.9	22.9	41.8	64.7
Utah.....	28.8	35.7	-8	7.7	6.9	-1	6.8
Vermont.....	2.0	2.6	.6	0	.6	0	.6
Virginia ²	112.8	125.5	3.6	9.1	12.7	10.3	23.0
Washington.....	45.9	51.5	3.4	2.2	5.6	1.9	7.5
West Virginia.....	6.0	6.4	.4	0	.4	0	.4
Wisconsin.....	11.6	14.6	2.8	.2	3.0	-8	2.2
Wyoming.....	1.1	1.3	.2	0	.2	-6	-4
Undistributed.....	54.8	90.4	35.6	0	35.6	14.6	50.2
U.S. total.....	2,033.4	2,387.3	259.9	94.0	353.9	190.8	544.7

¹ Defense-generated employment in 387 EIS plants, all other prime contractor plants, and civil service employment at DOD installations.

² 9 States with largest absolute increases, accounting for 52 percent of the 353,900 increase in col. 5.

Finally, focusing on a longer time span, table 13 presents defense-generated industrial employment trends from 1963 to June 1966 for 150 EIS plants that have been surveyed continuously since 1963. The defense-generated employment for these 150 plants represented 72 percent of the total defense-generated employment in the 387 plants as of June 1966.

Employment totaled 719,000 in June 1963 which was below the peak reached in 1962. The downward trend continued to June 1965 but was reversed during the following year. The most significant employment changes among the defense product groups during 1963-65 were the decreases in missiles (40 percent) and electronics and communications (28 percent).

FUTURE REPORTING

The next cycle of contractor reporting under the EIS covers the period ending December 31, 1966. Improvements in the data are expected particularly with respect to expanded coverage and the reporting of time-phasing profiles for assessing the employment impact of large defense projects. Using these updated reports, statistical summaries similar to those presented in this article are planned for release during mid-1967 and periodically thereafter.

CONCLUSIONS

These statistics, although somewhat incomplete as to coverage, present for the first time an indication of the geographic concentration and dependency of the employment generated by defense programs as well as the change in these dimensions over time. As such they provide a measure not only of "potential impact" as measured by current dependency on defense programs, but, in a historical sense, "actual" impacts (expressed as changes in defense-generated employment) over time.

Employment in military installations appears to be the dominant cause of significantly above-average defense dependency, particularly for labor areas with a small labor force. Large labor areas are generally less dependent on defense-generated employment and typically have a wider defense-oriented base.

Approximately 65 percent of defense-generated industrial workers on defense prime contracts are located in 10 States having approximately half of the total U.S. civilian work force. The data indicate, however, that the distribution of defense subcontract work may be somewhat more concentrated than work performed on prime contracts.

The total magnitude, as well as the geographic and program impact of the defense budget increase during fiscal year 1966, is documented by the data. It is important to note that, although this increase in defense-generated employment accounted for 25 percent of the total increase in the civilian work force, the geographic impact was quite widely dispersed and a significant share of the total increment was focused on firms producing commercial items.

Using data of this nature and supplementary economic statistics now being generated both within and outside DOD, it should be possible to develop improved methods for assessing more accurately the results of major shifts in defense programs. These analyses should be useful both to appropriate Government agencies in their programs for mitigating the adverse effects of such shifts and to industry as the supplier of defense requirements.

TABLE 13.—*Defense-generated employment trends in 150 EIS plants, 1963-66*

[In thousands]

Product group	June 1963	June 1964	June 1965	December 1965	June 1966
Aircraft	255	245	221	233	248
Missiles and space.....	193	162	116	117	123
Ships.....	41	46	51	51	51
Vehicles and weapons ¹	16	11	14	13	15
Ammunition.....	26	23	18	23	33
Electronics and communications.....	188	152	135	139	143
Total.....	719	639	555	576	² 613

¹ Includes only plants where defense work is dominant. Military trucks and vehicles produced or assembled in large automotive complexes are not included in the EIS survey.

² Defense employment for June 1966 for these 150 plants represents 72 percent of the total defense employment generated by the 387 EIS plants. This percent coverage varies by product group as follows: aircraft 81 percent; missiles, 90 percent; ships, 78 percent; vehicles, 69 percent; ammunition, 46 percent; and electronics, 62 percent.

MILITARY PRIME CONTRACT AWARDS

BY

REGION and STATE



FISCAL YEARS

- 1962
- 1963
- 1964
- 1965
- 1966

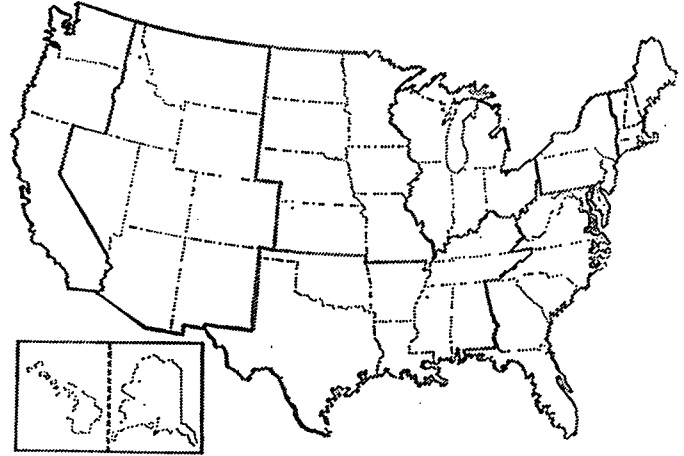


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FOREWORD

This pamphlet contains a record of military prime contract awards of \$10,000 or more in fiscal years 1962 through 1966 which are assignable by state and geographic region.

Two types of information are presented in this pamphlet. In part A, data are shown for all military prime contracts by State and geographic region, and individual tables are shown for each State breaking out total procurement according to 25 major categories of supplies, equipment, and services.

Part B covers procurement for research, development, test, and evaluation (R.D.T. & E.) work by State and region. These amounts are included in part A. The R.D.T. & E. total for each State is subdivided to show awards to educational institutions, other non-profit institutions, and business firms. Beginning with fiscal year 1965, awards to research foundations and nonprofit corporations associated with universities are included in the dollar amounts reported for "other nonprofit institutions." Formerly, such awards were recorded under "schools and their affiliates."

It is emphasized that prime contract data are not a measure of the total volume of defense work that is performed within a State, because they do not reflect the very substantial amount of sub-contract funds that may flow into and out of the State. About half of the prime contract dollars for major hard goods, and unknown proportions of other types of procurement, are subcontracted by the prime contractor.

In general, the State data are based on the location of the plant where the product will be finally processed or assembled. For contracts where companies assign the work to more than one plant, the location is the address of the plant where the greater part of the work is done or where the management responsibility is centered. When this cannot be determined, the contracts are assigned to a "not distributed by State" category and are excluded from this report. The amounts not distributed by State consist principally of all contracts and purchases below \$10,000 each but also include other contracts which for security reasons could not be assigned to a state. The amounts not distributed by State were as follows:

Fiscal year—	Billions
1962.....	\$2.8
1963.....	2.9
1964.....	3.1
1965.....	3.4
1966.....	4.0

Some special characteristics of the data on prime contract awards by procurement program category should be noted:

The electronics category includes all electronics and communications equipment which is separately procured under prime contract. In the case of missiles and aircraft, electronics work is often an integral part of the assembly prime contract, and therefore is not separately identified as electronics in the prime contract statistics.

Weapons, whether for use in ships, tanks or aircraft, are separately procured and separately reported.

Contracts for all other types of equipment and parts, and for repair, maintenance, overhaul, modification and other services, which can be identified with one of the specified program categories, are assigned to that category. For example, the installation or checkout of equipment at ballistic missile sites is recorded as missile work in the State where the site is located. (The contract for manufacture of such equipment is reported according to the location of the manufacturer's plant.) Aircraft, missile, or other program contracts, therefore, may be reported in States where there are no weapon assembly plants, but where bases, laboratories, or suppliers of instruments, parts, or support equipment may be located.

The dollar volume shown for each category includes research, development, test, or evaluation (R.D.T. & E.) work associated with it. The scope of R.D.T. & E. includes the following activities:

Reserch.—All effort directed toward increased knowledge of natural phenomena and solution of problems in the various sciences, but exclusive of efforts directed to prove the feasibility of solutions of problems of immediate military importance or time-oriented investigations and developments. This work is done primarily by universities with some by in-house laboratories and industry.

Exploratory development.—Effort directed toward the solution of specific military problems short of major development projects. This may vary from time-oriented applied research to advanced breadboard hardware, study, programing, and planning efforts. It is pointed toward specific military problem areas with a view toward developing possible solutions and determining their characteristics. This work is widely distributed to in-house laboratories and industry, with some to universities.

Advanced development.—All projects which have moved into the development of hardware for experimental or engineering test.

Engineering development.—Development programs being engineered for service use but not yet approved for procurement or operation. This work is done principally by industry.

Operational systems development.—Effort directed toward development, engineering, and test of systems which have been approved for production and service employment, but otherwise having the same characteristics as engineering development programs.

Management and support.—Effort in support of installations or operations required for general research and development use, such as test ranges and maintenance support of laboratories.

PART - A

U. S. MILITARY PRIME CONTRACT AWARDS BY REGION, STATE AND COMMODITY CATEGORY
FISCAL YEARS 1962 - 1966

TABLE I - MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE AND PERCENT OF U. S. TOTAL--BY REGION AND STATE
FISCAL YEARS 1962-1966

Region and State	Millions of Dollars						Percent of U. S. Total					
	FY 1962	FY 1963	FY 1964	FY 1965	FY 1966	FY 1967	FY 1962	FY 1963	FY 1964	FY 1965	FY 1966	FY 1967
U. S. Total	\$25,039 ^{a/}	\$25,233 ^{a/}	\$24,417 ^{a/}	\$23,268 ^{a/}	\$31,713 ^{a/}		100.0%	100.0%	100.0%	100.0%	100.0%	
NEW ENGLAND	2,736	2,277	2,307	2,599	3,761		10.9	9.0	9.5	11.2	11.9	
Maine	80	58	32	69	51		0.3	0.2	0.1	0.3	0.2	
New Hampshire	59	51	65	53	110		0.2	0.2	0.3	0.2	0.3	
Vermont	16	12	14	32	81		0.1	0.1	0.1	0.1	0.3	
Massachusetts	1,310	1,060	1,032	1,179	1,336		5.2	4.2	4.2	5.1	4.2	
Rhode Island	58	47	38	86	132		0.2	0.2	0.2	0.4	0.4	
Connecticut	1,213	1,049	1,226	1,180	2,051		4.8	4.2	4.6	5.1	6.5	
MIDDLE ATLANTIC	4,684	4,639	4,297	4,039	5,574		18.7	18.4	17.6	17.3	17.6	
New York	2,669	2,500	2,496	2,230	2,819		10.7	9.9	10.2	9.6	8.9	
New Jersey	1,063	1,252	918	820	1,090		4.3	5.0	3.8	3.5	3.4	
Pennsylvania	952	887	883	989	1,665		3.8	3.5	3.6	4.2	5.3	
EAST NORTH CENTRAL	3,168	3,171	2,764	2,626	4,860		12.6	12.6	11.3	11.3	15.3	
Ohio	1,129	1,346	1,029	863	1,589		4.5	5.3	4.2	3.7	5.0	
Indiana	571	487	538	605	1,068		2.3	1.9	2.2	2.6	3.4	
Illinois	531	486	429	422	920		2.1	1.9	1.8	1.8	2.9	
Michigan	678	633	591	533	918		2.7	2.5	2.4	2.3	2.9	
Wisconsin	259	219	177	203	365		1.0	0.9	0.7	0.9	1.1	
WEST NORTH CENTRAL	1,681	1,601	2,202	1,796	2,358		6.7	6.3	9.0	7.7	7.5	
Minnesota	297	274	218	259	498		1.2	1.1	0.9	1.1	1.6	
Iowa	179	130	104	134	248		0.7	0.5	0.4	0.6	0.8	
Missouri	546	686	1,349	1,061	1,113		2.2	2.7	5.5	4.6	3.5	
North Dakota	100	65	192	49	83		0.4	0.3	0.8	0.2	0.3	
South Dakota	113	81	23	21	23		0.5	0.3	0.1	0.1	0.1	
Nebraska	53	33	34	43	80		0.2	0.1	0.1	0.2	0.3	
Kansas	393	332	289	229	313		1.6	1.3	1.2	1.0	1.0	
SOUTH ATLANTIC	2,596	2,862	3,207	3,095	3,975		10.4	11.4	13.1	13.3	12.5	
Delaware	37	48	30	38	38		0.1	0.2	0.1	0.2	0.1	
Maryland	470	606	548	584	843		1.9	2.4	2.3	2.5	2.7	
District of Columbia	182	238	223	248	328		0.7	0.9	0.9	1.0	1.0	
Virginia	446	485	691	469	426		1.8	1.9	2.8	2.0	1.3	
West Virginia	144	162	87	90	149		0.6	0.7	0.4	0.4	0.5	
North Carolina	269	259	273	288	449		1.1	1.0	1.1	1.2	1.4	
South Carolina	65	58	52	82	176		0.3	0.2	0.2	0.4	0.6	
Georgia	337	423	520	663	799		1.4	1.7	2.1	2.8	2.5	
Florida	646	583	783	633	767		2.6	2.3	3.2	2.7	2.4	

TABLE I (Cont'd.)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE AND PERCENT OF U. S. TOTAL--BY REGION AND STATE
 FISCAL YEARS 1962-1966

Region and State	Millions of Dollars						Percent of U. S. Total					
	FY 1962	FY 1963	FY 1964	FY 1965	FY 1966	FY 1967	FY 1962	FY 1963	FY 1964	FY 1965	FY 1966	FY 1967
SOUTH CENTRAL	\$1,953	\$2,169	\$2,209	\$2,419	\$3,865		7.8%	8.6%	9.0%	10.4%	12.2%	
Kentucky	44	56	40	43	70		0.2	0.2	0.2	0.2	0.2	
Tennessee	184	184	194	177	502		0.7	0.7	0.8	0.8	1.6	
Alabama	154	195	191	155	282		0.6	0.8	0.8	0.7	0.9	
Mississippi	100	186	156	152	162		0.4	0.7	0.6	0.7	0.5	
Arkansas	85	39	30	39	96		0.3	0.2	0.1	0.2	0.3	
Louisiana	244	195	181	256	303		1.0	0.8	0.7	1.1	1.0	
Oklahoma	136	111	123	120	158		0.5	0.5	0.5	0.5	0.5	
Texas	1,006	1,203	1,294	1,447	2,292		4.0	4.8	5.3	6.2	7.2	
MOUNTAIN	1,166	1,446	1,055	809	837		4.7	5.7	4.3	3.5	2.6	
Montana	31	79	16	69	14		0.1	0.3	0.1	0.3	0.1	
Idaho	26	9	8	12	20		0.1	*	*	0.1	*	
Wyoming	23	125	49	8	11		0.1	0.5	0.2	*	*	
Colorado	565	444	390	249	256		2.3	1.8	1.6	1.1	0.8	
Utah	299	428	340	191	170		1.2	1.7	1.4	0.8	0.5	
Nevada	8	13	6	19	32		*	0.1	*	0.1	0.1	
New Mexico	61	62	72	84	86		0.2	0.2	0.3	0.4	0.3	
Arizona	153	286	174	177	248		0.6	1.1	0.7	0.8	0.8	
PACIFIC	6,960	6,219	6,215	5,739	6,347		27.8	27.4	25.6	24.7	20.0	
Washington	921	1,041	1,086	545	444		3.7	4.1	4.5	2.3	1.4	
Oregon	46	42	29	40	90		0.2	0.2	0.1	0.2	0.3	
California	5,993	5,836	5,100	5,154	5,813		23.9	23.1	21.0	22.1	18.3	
ALASKA & HAWAII	95	149	154	146	136		0.4	0.6	0.6	0.6	0.4	
Alaska	63	104	102	74	72		0.3	0.4	0.4	0.3	0.2	
Hawaii	32	45	52	72	64		0.1	0.2	0.2	0.3	0.2	

NOTE: See Table III for detail in thousands of dollars by state and program, and for footnotes.

TABLE II
MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR MAJOR MILITARY HARD GOODS - BY GEOGRAPHIC REGION
FISCAL YEARS 1962-1966

Program and Geographic Area	Millions of Dollars						Percent of Program Total					
	FY 1962	FY 1963	FY 1964	FY 1965	FY 1966	FY 1967	FY 1962	FY 1963	FY 1964	FY 1965	FY 1966	FY 1967
AIRCRAFT	\$5,154	\$5,480	\$6,167	\$5,770	\$7,791		100.0%	100.0%	100.0%	100.0%	100.0%	
New England	966	752	774	850	1,631		18.7	13.7	12.5	14.7	20.9	
Middle Atlantic	1,045	981	841	818	1,133		20.3	17.9	13.6	14.2	14.5	
East North Central	658	926	765	605	1,018		12.8	16.9	12.4	10.5	13.1	
West North Central	623	749	1,369	1,031	886		12.1	13.7	22.2	17.9	11.4	
South Atlantic	311	419	515	600	695		6.0	7.6	8.4	10.4	8.9	
South Central	385	559	736	838	1,321		7.5	10.2	11.9	14.5	17.0	
Mountain	32	47	32	55	100		0.6	0.9	0.5	0.9	1.3	
Pacific	1,134	1,046	1,132	969	1,006		22.0	19.1	18.4	16.8	12.9	
Alaska & Hawaii	b/	1	3	4	1		*	*	0.1	0.1	*	
MISSILE AND SPACE SYSTEMS	\$6,827	\$6,855	\$5,807	\$4,436	\$4,352		100.0%	100.0%	100.0%	100.0%	100.0%	
New England	549	433	468	403	422		8.0	6.3	8.1	9.1	9.7	
Middle Atlantic	725	660	557	517	589		10.6	9.6	9.6	11.7	12.1	
East North Central	256	215	205	201	161		3.8	3.2	3.5	4.5	3.7	
West North Central	125	171	182	126	197		1.8	2.5	3.1	2.8	4.5	
South Atlantic	607	563	593	480	512		8.9	8.2	10.2	10.8	11.8	
South Central	87	152	186	139	132		1.3	2.2	3.2	3.1	3.0	
Mountain	815	980	650	344	282		11.9	14.3	11.2	7.8	6.5	
Pacific	3,663	3,680	2,966	2,226	2,123		53.7	53.7	51.1	50.2	48.7	
Alaska & Hawaii	b/	1	b/	b/	1		*	*	*	*	*	
SHIPS	\$1,558	\$1,746	\$1,529	\$1,785	\$1,408		100.0%	100.0%	100.0%	100.0%	100.0%	
New England	396	342	275	493	343		25.4	19.6	18.0	27.6	24.4	
Middle Atlantic	394	521	320	245	341		25.3	29.8	20.9	13.7	24.2	
East North Central	96	104	94	60	106		6.2	6.0	6.2	3.4	7.5	
West North Central	10	5	2	4	6		0.7	0.3	0.1	0.3	0.4	
South Atlantic	292	343	406	317	270		18.7	19.7	31.8	17.7	19.2	
South Central	124	180	82	198	93		7.9	10.3	5.3	11.1	6.6	
Mountain	b/	1	1	2	3		*	*	0.1	0.1	0.2	
Pacific	246	250	269	465	245		15.8	14.3	17.6	26.0	17.4	
Alaska & Hawaii	b/	0	b/	1	1		*	0.0	*	0.1	0.1	
TANK-AUTOMOTIVE	\$1,046	\$1,032	\$ 770	\$ 854	\$1,552		100.0%	100.0%	100.0%	100.0%	100.0%	
New England	5	5	4	4	20		0.5	0.6	0.4	0.5	1.3	
Middle Atlantic	93	25	36	69	111		9.0	2.4	4.7	8.1	7.1	
East North Central	710	749	573	645	1,179		67.8	72.5	73.5	75.5	75.6	
West North Central	10	8	9	18	32		0.9	0.8	1.2	2.1	2.0	
South Atlantic	55	120	55	68	123		5.2	11.7	7.0	7.9	7.9	
South Central	37	31	29	26	57		3.5	3.0	3.8	3.0	3.7	
Mountain	3	5	1	2	3		0.3	0.5	0.2	0.3	0.2	
Pacific	133	88	72	22	34		12.8	8.5	9.2	2.6	2.2	
Alaska & Hawaii	b/	b/	b/	b/	b/		*	*	*	*	*	

TABLE II (Cont'd.)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR MAJOR MILITARY HARD GOODS - BY GEOGRAPHIC REGION
 FISCAL YEARS 1962-1966

Program and Geographic Area	Millions of Dollars						Percent of Program Total					
	FY 1962	FY 1963	FY 1964	FY 1965	FY 1966	FY 1967	FY 1962	FY 1963	FY 1964	FY 1965	FY 1966	FY 1967
WEAPONS	\$ 222	\$ 216	\$ 213	\$ 301	\$ 507		100.0%	100.0%	100.0%	100.0%	100.0%	
New England	83	52	44	43	188		37.3	24.2	20.7	14.4	37.1	
Middle Atlantic	38	41	71	76	82		17.1	19.0	33.3	25.2	16.3	
East North Central	50	55	34	40	74		22.2	25.4	16.0	13.4	14.5	
West North Central	7	16	11	64	42		3.1	7.6	5.1	21.1	8.2	
South Atlantic	6	15	10	18	17		2.9	6.9	4.9	6.0	3.3	
South Central	9	7	9	11	24		4.1	3.2	4.4	3.8	4.7	
Mountain	b/	2	1	1	5		0.2	1.0	0.3	0.3	1.0	
Pacific	29	28	33	48	75		13.1	12.7	15.3	15.8	14.9	
Alaska & Hawaii	0	0	0	0	0		0.0	0.0	0.0	0.0	0.0	
AMMUNITION	\$ 924	\$ 894	\$ 672	\$ 775	\$2,855		100.0%	100.0%	100.0%	100.0%	100.0%	
New England	60	50	67	65	196		6.5	5.6	9.9	8.4	6.9	
Middle Atlantic	91	77	86	104	389		9.8	8.6	12.8	13.3	13.6	
East North Central	186	186	141	139	591		20.1	20.8	21.0	18.0	20.7	
West North Central	198	180	114	100	467		21.4	20.1	17.0	12.9	16.4	
South Atlantic	86	112	46	84	167		9.3	12.5	6.9	10.9	5.8	
South Central	139	128	104	97	505		15.1	14.4	15.5	12.6	17.7	
Mountain	3	5	7	8	25		0.4	0.6	1.0	1.0	0.9	
Pacific	161	156	107	178	515		17.4	17.4	15.9	22.9	18.0	
Alaska & Hawaii	0	0	0	0	0		0.0	0.0	0.0	0.0	0.0	
ELECTRONICS AND COMMUNICATION EQUIPMENT	\$3,343	\$3,142	\$3,012	\$2,983	\$3,791		100.0%	100.0%	100.0%	100.0%	100.0%	
New England	318	302	285	384	435		9.5	9.6	9.5	12.9	11.5	
Middle Atlantic	1,291	1,207	1,065	968	1,132		38.6	38.5	35.4	32.5	29.9	
East North Central	541	304	318	300	390		16.2	9.7	10.5	10.1	10.3	
West North Central	193	148	114	149	259		5.8	4.7	3.8	5.0	6.8	
South Atlantic	362	371	385	346	535		10.8	11.8	12.8	11.6	14.1	
South Central	109	139	140	118	256		3.3	4.4	4.6	3.9	6.8	
Mountain	47	41	94	73	88		1.4	1.3	3.1	2.4	2.3	
Pacific	474	563	581	628	694		14.2	17.9	19.3	21.0	18.3	
Alaska & Hawaii	8	67	30	17	2		0.2	2.1	1.0	0.6	*	

NOTE: See Table III for detail in thousands of dollars by state and program, and for footnotes.

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

TOTAL: ALL STATES AND THE DISTRICT OF COLUMBIA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$25,038,690 ^{a/}	100.0	\$25,233,240 ^{a/}	100.0	\$24,417,107 ^{a/}	100.0
Airframes & Related Assemblies & Spares	3,178,091	100.0	3,657,508	100.0	4,492,918	100.0
Aircraft Engines & Related Spares	1,200,986	100.0	1,118,450	100.0	1,121,156	100.0
Other Aircraft Equipment & Supplies	775,115	100.0	703,846	100.0	553,295	100.0
Missile and Space Systems	6,827,276	100.0	6,854,957	100.0	5,806,764	100.0
Ships	1,558,548	100.0	1,745,755	100.0	1,528,797	100.0
Combat Vehicles	553,916	100.0	573,884	100.0	353,135	100.0
Non-Combat Vehicles	492,549	100.0	458,692	100.0	425,676	100.0
Weapons	222,077	100.0	216,522	100.0	213,238	100.0
Ammunition	923,899	100.0	894,076	100.0	672,257	100.0
Electronics & Communication Equipment	3,343,011	100.0	3,141,995	100.0	3,012,120	100.0
Petroleum	844,187	100.0	838,301	100.0	761,584	100.0
Other Fuels & Lubricants	36,354	100.0	34,445	100.0	22,272	100.0
Separately Procured Containers & Handling Equipment	1,106	100.0	779	100.0	1,632	100.0
Textiles, Clothing & Equipage	419,369	100.0	266,006	100.0	271,860	100.0
Military Building Supplies	23,175	100.0	40,973	100.0	20,084	100.0
Subsistence	637,292	100.0	585,715	100.0	582,612	100.0
Transportation Equipment	3,470	100.0	2,805	100.0	677	100.0
Production Equipment	102,501	100.0	105,228	100.0	59,964	100.0
Construction	1,205,142	100.0	1,117,439	100.0	1,296,351	100.0
Construction Equipment	92,758	100.0	111,114	100.0	91,795	100.0
Medical & Dental Supplies & Equipment	105,469	100.0	66,557	100.0	77,473	100.0
Photographic Equipment & Supplies	72,562	100.0	62,313	100.0	65,646	100.0
Materials Handling Equipment	40,867	100.0	66,319	100.0	53,927	100.0
All Other Supplies & Equipment	824,096	100.0	735,373	100.0	715,451	100.0
Services	1,554,874	100.0	1,834,188	100.0	2,216,423	100.0

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

TOTAL: ALL STATES AND THE DISTRICT OF COLUMBIA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$23,268,080 ^a	100.0	\$31,713,303 ^a	100.0		
Airframes & Related Assemblies & Spares	3,993,504	100.0	4,601,870	100.0		
Aircraft Engines & Related Spares	1,105,576	100.0	2,159,308	100.0		
Other Aircraft Equipment & Supplies	670,925	100.0	1,030,083	100.0		
Missile and Space Systems	4,435,592	100.0	4,358,839	100.0		
Ships	1,785,270	100.0	1,407,691	100.0		
Combat Vehicles	265,652	100.0	577,452	100.0		
Non-Combat Vehicles	588,606	100.0	981,738	100.0		
Weapons	301,276	100.0	506,790	100.0		
Ammunition	774,703	100.0	2,854,635	100.0		
Electronics & Communication Equipment	2,983,306	100.0	3,791,544	100.0		
Petroleum	775,865	100.0	859,520	100.0		
Other Fuels & Lubricants	29,430	100.0	27,369	100.0		
Separately Procured Containers & Handling Equipment	7,732	100.0	6,952	100.0		
Textiles, Clothing & Equipage	367,723	100.0	1,260,930	100.0		
Military Building Supplies	28,348	100.0	361,314	100.0		
Subsistence	652,725	100.0	1,047,350	100.0		
Transportation Equipment	569	100.0	7,573	100.0		
Production Equipment	63,301	100.0	178,237	100.0		
Construction	1,272,789	100.0	1,002,866	100.0		
Construction Equipment	59,549	100.0	214,318	100.0		
Medical & Dental Supplies & Equipment	112,776	100.0	214,307	100.0		
Photographic Equipment & Supplies	99,846	100.0	163,787	100.0		
Materials Handling Equipment	35,872	100.0	104,449	100.0		
All Other Supplies & Equipment	760,519	100.0	1,387,904	100.0		
Services	2,096,566	100.0	2,606,477	100.0		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ALABAMA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 154,419	0.6	\$ 194,990	0.8	\$ 190,681	0.8
Airframes & Related Assemblies & Spares	15,494	0.5	28,780	0.8	21,641	0.5
Aircraft Engines & Related Spares		0.0	64	*	5,890	0.5
Other Aircraft Equipment & Supplies	8,206	1.1	18,661	2.7	21,849	4.0
Missile and Space Systems	17,918	0.3	14,830	0.2	20,371	0.4
Ships	7,632	0.5	13,789	0.8	4,252	0.3
Combat Vehicles	83	*	344	0.1	779	0.2
Non-Combat Vehicles	10,141	2.1	8,475	1.9	8,419	2.0
Weapons	292	0.1	1,020	0.5	1,281	0.6
Ammunition	16,484	1.8	12,249	1.4	6,954	1.0
Electronics & Communication Equipment	3,454	0.1	1,579	0.1	1,549	0.1
Petroleum	2,709	0.3	2,396	0.3	3,191	0.4
Other Fuels & Lubricants	431	1.2	951	2.8	183	0.8
Separately Procured Containers & Handling Equipment		0.0	32	4.1		0.0
Textiles, Clothing & Equipage	21,006	5.0	14,048	5.3	14,588	5.4
Military Building Supplies	860	3.7	8,357	20.4	295	1.5
Subsistence	1,622	0.3	3,703	0.6	4,467	0.8
Transportation Equipment		0.0		0.0		0.0
Production Equipment	96	0.1	139	0.1	140	0.2
Construction	19,122	1.6	30,620	2.7	33,879	2.6
Construction Equipment	102	0.1	59	0.1	110	0.1
Medical & Dental Supplies & Equipment	58	0.1	24	*	13	*
Photographic Equipment & Supplies	278	0.4	876	1.4	158	0.2
Materials Handling Equipment	147	0.4	1,151	1.7	350	0.6
All Other Supplies & Equipment	4,794	0.6	8,824	1.2	22,899	3.2
Services	23,490	1.5	24,019	1.3	17,423	0.8

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ALABAMA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$165,176	0.7	\$281,549	0.9		
Airframes & Related Assemblies & Spares	16,721	0.4	17,306	0.4		
Aircraft Engines & Related Spares	170	*	10	*		
Other Aircraft Equipment & Supplies	16,073	2.4	17,884	1.7		
Missile and Space Systems	16,539	0.4	23,204	0.5		
Ships	19,286	1.1	3,438	0.2		
Combat Vehicles	683	0.3	748	0.1		
Non-Combat Vehicles	7,192	1.2	17,798	1.8		
Weapons	696	0.2	4,395	0.9		
Ammunition	3,333	0.4	26,752	0.9		
Electronics & Communication Equipment	2,968	0.1	2,540	0.1		
Petroleum	3,616	0.5	3,220	0.4		
Other Fuels & Lubricants	623	2.1	859	3.1		
Separately Procured Containers & Handling Equipment	1,351	17.4	634	9.1		
Textiles, Clothing & Equipage	20,449	5.6	89,296	7.1		
Military Building Supplies	3,360	11.8	14,072	3.9		
Subsistence	4,501	0.7	5,919	0.6		
Transportation Equipment		0.0		0.0		
Production Equipment	158	0.2	997	0.6		
Construction	21,327	1.7	13,270	1.3		
Construction Equipment		0.0	106	*		
Medical & Dental Supplies & Equipment	42	*	48	*		
Photographic Equipment & Supplies	47	*	949	0.6		
Materials Handling Equipment	69	0.2	1,417	1.4		
All Other Supplies & Equipment	4,793	0.6	10,180	0.7		
Services	21,179	1.0	26,507	1.0		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ALASKA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 63,320	0.3	\$ 103,476	0.4	\$ 101,545	0.4
Airframes & Related Assemblies & Spares	375	*	444	*	340	*
Aircraft Engines & Related Spares		0.0		0.0	35	*
Other Aircraft Equipment & Supplies		0.0		0.0		0.0
Missile and Space Systems		0.0	559	*		0.0
Ships		0.0		0.0		0.0
Combat Vehicles		0.0		0.0	14	*
Non-Combat Vehicles	44	*	18	*	82	*
Weapons		0.0		0.0		0.0
Ammunition		0.0		0.0		0.0
Electronics & Communication Equipment	7,084	0.2	66,248	2.1	29,337	1.0
Petroleum	672	0.1	54	*	1,672	0.2
Other Fuels & Lubricants	4,540	12.5	4,467	13.0	4,049	18.2
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	518	0.1		0.0	12	*
Military Building Supplies	42	0.2	19	*	51	0.3
Subsistence	2,789	0.4	2,295	0.4	2,455	0.4
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0		0.0		0.0
Construction	24,706	2.1	22,766	2.0	51,572	4.0
Construction Equipment		0.0		0.0		0.0
Medical & Dental Supplies & Equipment		0.0	25	*		0.0
Photographic Equipment & Supplies		0.0		0.0		0.0
Materials Handling Equipment	13	*		0.0		0.0
All Other Supplies & Equipment	2,236	0.3	2,447	0.3	158	*
Services	20,301	1.3	4,134	0.2	11,768	0.5

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ALASKA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$74,175	0.3	\$71,666	0.2		
Airframes & Related Assemblies & Spares	144	*	483	*		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies		0.0	11	*		
Missile and Space Systems		0.0	418	*		
Ships		0.0		0.0		
Combat Vehicles		0.0		0.0		
Non-Combat Vehicles	68	*	29	*		
Weapons		0.0		0.0		
Ammunition		0.0		0.0		
Electronics & Communication Equipment	15,797	0.5	366	*		
Petroleum	6,666	0.9	1,098	0.1		
Other Fuels & Lubricants	3,773	12.8	5,467	20.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage		0.0		0.0		
Military Building Supplies	10	*	48	*		
Subsistence	3,162	0.5	2,240	0.2		
Transportation Equipment		0.0		0.0		
Production Equipment	18	*		0.0		
Construction	32,038	2.5	27,125	2.7		
Construction Equipment	16	*	67	*		
Medical & Dental Supplies & Equipment		0.0		0.0		
Photographic Equipment & Supplies	14	*		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	642	0.1	565	*		
Services	11,827	0.6	33,749	1.3		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ARIZONA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 152,951	0.6	\$ 285,751	1.1	\$ 173,825	0.7
Airframes & Related Assemblies & Spares	5,408	0.2	7,683	0.2	9,280	0.2
Aircraft Engines & Related Spares	1,174	0.1	2,493	0.2	1,530	0.1
Other Aircraft Equipment & Supplies	18,921	2.4	34,992	5.0	19,474	3.5
Missile and Space Systems	50,304	0.7	151,915	2.2	16,394	0.3
Ships	122	*	266	*	273	*
Combat Vehicles		0.0	30	*		0.0
Non-Combat Vehicles	113	*	49	*		0.0
Weapons	74	*	20	*	95	*
Ammunition	1,128	0.1	353	*	1,124	0.2
Electronics & Communication Equipment	34,290	1.0	29,349	0.9	75,116	2.5
Petroleum	283	*	223	*	579	0.1
Other Fuels & Lubricants	173	0.5	329	1.0		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	240	*	163	0.1	231	0.1
Military Building Supplies	2,048	8.8	5,263	12.8	2,264	11.3
Subsistence	1,109	0.2	997	0.2	1,298	0.2
Transportation Equipment		0.0		0.0		0.0
Production Equipment	679	0.7		0.0	(-) 25 ^{S/}	--
Construction	22,711	1.9	32,398	2.9	18,603	1.4
Construction Equipment	1,500	1.6	42	*		0.0
Medical & Dental Supplies & Equipment		0.0	95	0.1		0.0
Photographic Equipment & Supplies		0.0	12	*	287	1.4
Materials Handling Equipment		0.0	102	0.2		0.0
All Other Supplies & Equipment	4,619	0.6	3,710	0.5	5,674	0.8
Services	8,055	0.5	15,267	0.8	21,628	1.0

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ARIZONA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$176,857	0.8	\$248,228	0.8		
Airframes & Related Assemblies & Spares	13,760	0.4	21,959	0.5		
Aircraft Engines & Related Spares	6,769	0.6	16,357	0.7		
Other Aircraft Equipment & Supplies	32,337	4.8	37,633	3.7		
Missile and Space Systems	28,477	0.6	43,425	1.0		
Ships	644	*	672	*		
Combat Vehicles	28	*	43	*		
Non-Combat Vehicles	27	*	25	*		
Weapons	211	0.1	377	0.1		
Ammunition	2,157	0.3	12,513	0.4		
Electronics & Communication Equipment	46,341	1.6	61,283	1.6		
Petroleum	285	*	147	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0	786	11.3		
Textiles, Clothing & Equipage	275	0.1	3,329	0.3		
Military Building Supplies	6	*		0.0		
Subsistence	1,503	0.2	2,031	0.2		
Transportation Equipment		0.0		0.0		
Production Equipment	(-) 17	0.0	50	*		
Construction	15,481	1.2	11,081	1.1		
Construction Equipment		0.0	86	*		
Medical & Dental Supplies & Equipment	86	0.1	81	*		
Photographic Equipment & Supplies	77	0.1	383	0.2		
Materials Handling Equipment	(-) 43	0.0		0.0		
All Other Supplies & Equipment	9,201	1.2	11,738	0.8		
Services	19,252	0.9	24,229	0.9		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ARKANSAS

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 84,798	0.3	\$ 39,114	0.2	\$ 29,731	0.1
Airframes & Related Assemblies & Spares		0.0	576	*	238	*
Aircraft Engines & Related Spares		0.0	11	*	18	*
Other Aircraft Equipment & Supplies	626	0.1	143	*	(-) 796 ^{c/}	---
Missile and Space Systems	1,529	*	113	*	503	*
Ships	55	*	147	*	140	*
Combat Vehicles	72	*		0.0	176	0.1
Non-Combat Vehicles	1,483	0.3	553	0.1	395	0.1
Weapons		0.0		0.0		0.0
Ammunition	223	*	1,640	0.2	1,291	0.2
Electronics & Communication Equipment	992	*	1,628	0.1	3,507	0.1
Petroleum	2,756	0.3	1,687	0.2	1,194	0.2
Other Fuels & Lubricants	153	0.4	148	0.4		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0	494	30.3
Textiles, Clothing & Equipage	2,529	0.6	4,995	1.9	4,667	1.7
Military Building Supplies	12	0.1		0.0		0.0
Subsistence	3,076	0.5	2,218	0.4	2,776	0.5
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0		0.0		0.0
Construction	67,611	5.6	22,096	2.0	10,883	0.8
Construction Equipment	33	*	12	*		0.0
Medical & Dental Supplies & Equipment		0.0		0.0		0.0
Photographic Equipment & Supplies		0.0		0.0		0.0
Materials Handling Equipment	68	0.2	319	0.5	247	0.5
All Other Supplies & Equipment	1,824	0.2	880	0.1	1,349	0.2
Services	1,756	0.1	1,948	0.1	2,649	0.1

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ARKANSAS

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$39,284	0.2	\$95,701	0.3		
Airframes & Related Assemblies & Spares	862	*	522	*		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	1,452	0.2	69	*		
Missile and Space Systems	618	*	488	*		
Ships	139	*	141	*		
Combat Vehicles		0.0	81	*		
Non-Combat Vehicles	803	0.1	2,440	0.3		
Weapons		0.0		0.0		
Ammunition	4,363	0.6	23,969	0.8		
Electronics & Communication Equipment	664	*	8,164	0.2		
Petroleum	2,180	0.3	1,288	0.1		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0	(-) 26 c/	---		
Textiles, Clothing & Equipage	7,501	2.0	22,641	1.8		
Military Building Supplies		0.0	11,310	3.1		
Subsistence	3,540	0.5	3,754	0.4		
Transportation Equipment		0.0		0.0		
Production Equipment		0.0	221	0.1		
Construction	12,258	1.0	3,565	0.4		
Construction Equipment	61	0.1	139	0.1		
Medical & Dental Supplies & Equipment	473	0.4	199	0.1		
Photographic Equipment & Supplies		0.0		0.0		
Materials Handling Equipment	149	0.4	1,715	1.6		
All Other Supplies & Equipment	1,680	0.2	11,967	0.9		
Services	2,541	0.1	3,054	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

CALIFORNIA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$5,993,246	23.9	\$5,835,670	23.1	\$5,100,650	21.0
Airframes & Related Assemblies & Spares	673,210	21.2	676,596	18.5	618,480	13.8
Aircraft Engines & Related Spares	16,195	1.3	21,893	2.0	87,416	7.8
Other Aircraft Equipment & Supplies	148,976	19.2	111,307	15.8	91,942	16.6
Missile and Space Systems	3,215,424	47.1	3,078,650	44.9	2,412,074	41.5
Ships	173,807	11.2	121,812	7.0	147,448	9.6
Combat Vehicles	118,685	21.4	80,696	14.1	58,129	16.5
Non-Combat Vehicles	8,501	1.7	4,795	1.1	8,875	2.1
Weapons	27,743	12.5	26,511	12.2	31,593	14.9
Ammunition	158,741	17.2	150,887	16.9	103,388	15.4
Electronics & Communication Equipment	466,662	14.0	555,089	17.6	574,480	19.1
Petroleum	162,541	19.3	191,565	22.9	180,882	23.8
Other Fuels & Lubricants	5,778	15.9	2,479	7.2	879	4.0
Separately Procured Containers & Handling Equipment	55	5.0	88	11.3	26	1.6
Textiles, Clothing & Equipage	8,311	2.0	5,676	2.1	4,883	1.8
Military Building Supplies	664	2.9	2,511	6.1	5,358	26.7
Subsistence	121,893	19.1	111,146	19.0	111,767	19.2
Transportation Equipment	16	0.5	79	2.8	85	12.6
Production Equipment	28,481	27.8	13,637	13.0	10,161	17.0
Construction	132,060	11.0	164,957	14.7	136,742	10.5
Construction Equipment	5,807	6.3	2,592	2.3	478	0.5
Medical & Dental Supplies & Equipment	3,450	3.3	3,307	5.0	4,496	5.8
Photographic Equipment & Supplies	11,893	16.4	8,485	13.6	9,316	14.2
Materials Handling Equipment	1,625	4.0	3,571	5.4	3,655	6.8
All Other Supplies & Equipment	120,962	14.7	140,441	19.1	107,621	15.1
Services	381,766	24.6	356,900	19.5	390,476	17.6

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

CALIFORNIA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$5,153,639	22.1	\$5,813,078	18.3		
Airframes & Related Assemblies & Spares	806,304	20.2	751,793	16.4		
Aircraft Engines & Related Spares	17,066	1.6	23,855	1.1		
Other Aircraft Equipment & Supplies	121,964	18.2	188,283	18.3		
Missile and Space Systems	2,029,336	45.8	1,912,787	43.9		
Ships	230,659	12.9	177,126	12.6		
Combat Vehicles	5,484	2.1	15,783	2.8		
Non-Combat Vehicles	14,300	2.4	15,481	1.6		
Weapons	45,974	15.2	66,429	13.1		
Ammunition	172,588	22.3	504,442	17.7		
Electronics & Communication Equipment	618,253	20.7	683,795	18.0		
Petroleum	173,104	22.3	190,675	22.2		
Other Fuels & Lubricants	575	2.0	119	0.4		
Separately Procured Containers & Handling Equipment	4,434	57.3	1,238	17.8		
Textiles, Clothing & Equipage	6,895	1.9	22,626	1.8		
Military Building Supplies	4,553	16.1	90,569	25.1		
Subsistence	122,044	18.7	246,852	23.6		
Transportation Equipment	99	17.4		0.0		
Production Equipment	9,325	14.7	27,744	15.6		
Construction	203,252	16.0	166,876	16.6		
Construction Equipment	1,288	2.2	2,001	0.9		
Medical & Dental Supplies & Equipment	6,952	6.2	12,784	6.0		
Photographic Equipment & Supplies	22,260	22.3	35,587	21.7		
Materials Handling Equipment	2,374	6.6	7,816	7.5		
All Other Supplies & Equipment	141,978	18.7	184,027	13.3		
Services	392,578	18.7	484,390	18.6		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

COLORADO

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 565,279	2.3	\$ 444,196	1.8	\$ 389,511	1.6
Airframes & Related Assemblies & Spares	712	*	578	*	211	*
Aircraft Engines & Related Spares		0.0	77	*	58	*
Other Aircraft Equipment & Supplies	560	0.1	291	*	425	0.1
Missile and Space Systems	486,074	7.1	356,789	5.2	299,110	5.2
Ships	51	*	14	*	54	*
Combat Vehicles	105	*		0.0	47	*
Non-Combat Vehicles	1,361	0.3	2,883	0.6	742	0.2
Weapons	287	0.1	2,064	1.0	279	0.1
Ammunition	1,671	0.2	2,725	0.3	951	0.1
Electronics & Communication Equipment	3,271	0.1	3,671	0.1	9,649	0.3
Petroleum	8,713	1.0	9,823	1.2	3,064	0.4
Other Fuels & Lubricants	1,020	2.8	727	2.1	473	2.1
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage		0.0	285	0.1	10	*
Military Building Supplies	129	0.6	41	0.1		0.0
Subsistence	14,561	2.3	10,005	1.7	10,423	1.8
Transportation Equipment		0.0		0.0		0.0
Production Equipment	13	*	17	*	394	0.7
Construction	19,086	1.6	18,397	1.6	30,651	2.4
Construction Equipment	828	0.9	393	0.4	120	0.1
Medical & Dental Supplies & Equipment	123	0.1	64	0.1	43	0.1
Photographic Equipment & Supplies	66	0.1	105	0.2	140	0.2
Materials Handling Equipment		0.0	61	0.1	2,510	4.7
All Other Supplies & Equipment	7,577	0.9	9,872	1.4	10,176	1.4
Services	19,071	1.2	25,314	1.4	19,961	0.9

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
COLORADO

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$249,151	1.1	\$255,893	0.8		
Airframes & Related Assemblies & Spares	(-) 120 c/	--	4,160	0.1		
Aircraft Engines & Related Spares	300	*	209	*		
Other Aircraft Equipment & Supplies	604	0.1	609	0.1		
Missile and Space Systems	157,873	3.6	138,564	3.2		
Ships	162	*	882	0.1		
Combat Vehicles	68	*	92	*		
Non-Combat Vehicles	419	0.1	623	0.1		
Weapons	288	0.1	1,014	0.2		
Ammunition	1,340	0.2	8,212	0.3		
Electronics & Communication Equipment	12,854	0.4	9,521	0.3		
Petroleum	1,703	0.2	2,620	0.3		
Other Fuels & Lubricants	483	1.6	355	1.3		
Separately Procured Containers & Handling Equipment		0.0	14	0.2		
Textiles, Clothing & Equipage	265	0.1	1,700	0.1		
Military Building Supplies	17	0.1	2,686	0.7		
Subsistence	16,395	2.5	18,946	1.8		
Transportation Equipment		0.0		0.0		
Production Equipment	415	0.6	850	0.5		
Construction	26,987	2.1	36,955	3.7		
Construction Equipment	183	0.3	266	0.1		
Medical & Dental Supplies & Equipment	146	0.1	229	0.1		
Photographic Equipment & Supplies	78	0.1	103	0.1		
Materials Handling Equipment	1,260	3.5	842	0.8		
All Other Supplies & Equipment	9,063	1.2	9,198	0.7		
Services	18,368	0.9	17,243	0.7		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

CONNECTICUT

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 1,213,067	4.8	\$ 1,048,449	4.2	\$1,126,054	4.6
Airframes & Related Assemblies & Spares	220,774	6.9	130,577	3.6	152,751	3.4
Aircraft Engines & Related Spares	514,865	42.9	400,010	35.8	419,574	37.4
Other Aircraft Equipment & Supplies	90,528	11.7	77,789	11.1	61,557	11.1
Missile and Space Systems	27,268	0.4	50,472	0.7	67,061	1.2
Ships	221,649	14.2	219,637	12.6	232,124	15.2
Combat Vehicles	795	0.2	116	*	441	0.1
Non-Combat Vehicles	1,834	0.4	2,750	0.6	411	0.1
Weapons	17,365	7.8	24,955	11.5	18,188	8.6
Ammunition	31,969	3.5	36,786	4.1	45,419	6.8
Electronics & Communication Equipment	41,690	1.2	43,901	1.4	47,751	1.6
Petroleum	3,296	0.4	1,207	0.1	584	0.1
Other Fuels & Lubricants		0.0	377	1.1		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	7,033	1.7	4,153	1.6	5,140	1.9
Military Building Supplies	11	*	89	0.2	73	0.4
Subsistence	569	0.1	641	0.1	507	0.1
Transportation Equipment	236	6.8	136	4.8	45	6.7
Production Equipment	3,729	3.6	3,253	3.1	7,196	12.0
Construction	2,935	0.2	7,000	0.6	4,522	0.3
Construction Equipment	1,183	1.3	247	0.2	79	0.1
Medical & Dental Supplies & Equipment	1,313	1.2	644	1.0	1,102	1.4
Photographic Equipment & Supplies	791	1.1	1,317	2.1	666	1.0
Materials Handling Equipment	581	1.4	8,684	13.1	1,514	2.8
All Other Supplies & Equipment	12,795	1.5	15,503	2.1	11,872	1.7
Services	9,858	0.6	18,205	1.0	47,477	2.1

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
CONNECTICUT

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$1,180,111	5.1	\$2,051,560	6.5		
Airframes & Related Assemblies & Spares	114,382	2.9	217,084	4.7		
Aircraft Engines & Related Spares	545,013	49.3	1,104,907	51.2		
Other Aircraft Equipment & Supplies	49,956	7.5	74,330	7.2		
Missile and Space Systems	35,020	0.8	54,015	1.2		
Ships	252,025	14.1	153,315	10.9		
Combat Vehicles	500	0.2	8,986	1.6		
Non-Combat Vehicles	1,791	0.3	3,929	0.4		
Weapons	6,691	2.2	76,277	15.1		
Ammunition	47,193	6.1	148,081	5.2		
Electronics & Communication Equipment	65,415	2.2	86,174	2.3		
Petroleum	676	0.1	341	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	9,349	2.5	13,676	1.1		
Military Building Supplies	49	0.2	80	*		
Subsistence	980	0.2	1,938	0.2		
Transportation Equipment	13	2.3		0.0		
Production Equipment	2,571	4.1	12,742	7.2		
Construction	10,480	0.8	3,078	0.3		
Construction Equipment	562	0.9	411	0.2		
Medical & Dental Supplies & Equipment	1,458	1.3	3,385	1.6		
Photographic Equipment & Supplies	4,455	4.5	5,134	3.1		
Materials Handling Equipment	1,214	3.4	6,888	6.6		
All Other Supplies & Equipment	13,988	1.8	51,047	3.7		
Services	16,330	0.8	25,742	1.0		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

DELAWARE

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 36,666	0.1	\$ 47,483	0.2	\$ 30,424	0.1
Airframes & Related Assemblies & Spares	693	*	2,311	0.1	926	*
Aircraft Engines & Related Spares	101	*		0.0		0.0
Other Aircraft Equipment & Supplies	423	0.1	1,590	0.2	3,212	0.6
Missile and Space Systems		0.0	1,276	*	487	*
Ships	4,574	0.3	1,865	0.1	362	*
Combat Vehicles	2,192	0.4		0.0		0.0
Non-Combat Vehicles	658	0.2	13,779	3.0	7,968	1.9
Weapons	10	*	93	*		0.0
Ammunition	1,699	0.2	1,521	0.2	438	0.1
Electronics & Communication Equipment	79	*	196	*	66	*
Petroleum	12,875	1.5	12,558	1.5	5,144	0.7
Other Fuels & Lubricants	108	0.3		0.0		*
Separately Procured Containers & Handling Equipment		0.0		0.0	14	0.8
Textiles, Clothing & Equipage	84	*	848	0.3	131	*
Military Building Supplies		0.0		0.0		0.0
Subsistence	1,964	0.3	2,757	0.5	3,635	0.6
Transportation Equipment		0.0		0.0		0.0
Production Equipment	2,602	2.5	99	0.1		0.0
Construction	1,692	0.1	650	0.1	1,496	0.1
Construction Equipment	34	*	74	0.1		0.0
Medical & Dental Supplies & Equipment	78	0.1	310	0.5	139	0.2
Photographic Equipment & Supplies	262	0.4	1,095	1.8	1,164	1.8
Materials Handling Equipment	209	0.5	45	0.1		0.0
All Other Supplies & Equipment	3,261	0.4	3,778	0.5	1,711	0.2
Services	3,068	0.2	2,638	0.1	3,531	0.2

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

DELAWARE

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$38,239	0.2	\$37,445	0.1		
Airframes & Related Assemblies & Spares	1,550	*	913	*		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	7,651	1.1	365	*		
Missile and Space Systems	55	*	272	*		
Ships	741	*	2,583	0.2		
Combat Vehicles		0.0	70	*		
Non-Combat Vehicles	585	0.1	5,302	0.5		
Weapons		0.0	14	*		
Ammunition	645	0.1	435	*		
Electronics & Communication Equipment	229	*	167	*		
Petroleum	6,036	0.8	9,170	1.1		
Other Fuels & Lubricants		0.0	(-) 13 c/	---		
Separately Procured Containers & Handling Equipment	17	0.2		0.0		
Textiles, Clothing & Equipage	496	0.1	1,959	0.2		
Military Building Supplies	68	0.2	516	0.1		
Subsistence	3,616	0.6	6,672	0.6		
Transportation Equipment		0.0		0.0		
Production Equipment	21	*	210	0.1		
Construction	2,169	0.2	2,216	0.2		
Construction Equipment		0.0	29	*		
Medical & Dental Supplies & Equipment	380	0.3	303	0.1		
Photographic Equipment & Supplies	538	0.5	621	0.4		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	9,317	1.2	1,012	0.1		
Services	4,125	0.2	4,629	0.2		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

DISTRICT OF COLUMBIA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 181,954	0.7	\$ 238,120	0.9	\$ 222,947	0.9
Airframes & Related Assemblies & Spares	106	*	193	*	10	*
Aircraft Engines & Related Spares		0.0	268	*	50	*
Other Aircraft Equipment & Supplies	673	0.1	745	0.1	38	*
Missile and Space Systems	958	*	8,558	0.1	403	*
Ships	37,013	2.4	59,034	3.4	27,845	1.8
Combat Vehicles	34	*		0.0	39	*
Non-Combat Vehicles	65	*	147	*	31	*
Weapons	424	0.2	513	0.2	296	0.1
Ammunition	117	*		0.0		0.0
Electronics & Communication Equipment	39,399	1.2	41,901	1.3	39,087	1.3
Petroleum	678	0.1	636	0.1	1,776	0.2
Other Fuels & Lubricants	284	0.8	429	1.2	494	2.2
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	120	*	11	*	211	*
Military Building Supplies		0.0	49	0.1		0.0
Subsistence	2,769	0.4	3,876	0.7	2,694	0.5
Transportation Equipment		0.0		0.0		0.0
Production Equipment	61	0.1	14	*	25	*
Construction	8,255	0.7	9,196	0.8	13,722	1.1
Construction Equipment	110	0.1	12	*		0.0
Medical & Dental Supplies & Equipment	195	0.2	185	0.3	25	*
Photographic Equipment & Supplies	421	0.6	906	1.5	331	0.5
Materials Handling Equipment		0.0	29	*	16	*
All Other Supplies & Equipment	21,990	2.7	16,399	2.2	35,465	5.0
Services	68,282	4.4	95,019	5.2	100,389	4.5

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

DISTRICT OF COLUMBIA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$247,576	1.0	\$328,111	1.0		
Airframes & Related Assemblies & Spares	56	*	109	*		
Aircraft Engines & Related Spares	36	*	29	*		
Other Aircraft Equipment & Supplies	25	*	103	*		
Missile and Space Systems	1,159	*	2,654	0.1		
Ships	50,007	2.8	89,269	6.4		
Combat Vehicles		0.0		0.0		
Non-Combat Vehicles	358	0.1	98	*		
Weapons	663	0.2	852	0.2		
Ammunition	175	*	246	*		
Electronics & Communication Equipment	35,947	1.2	45,512	1.2		
Petroleum	1,103	0.1	1,184	0.1		
Other Fuels & Lubricants	400	1.4	322	1.2		
Separately Procured Containers & Handling Equipment		0.0	12	0.2		
Textiles, Clothing & Equipage	180	*	462	*		
Military Building Supplies		0.0		0.0		
Subsistence	1,109	0.2	797	0.1		
Transportation Equipment		0.0		0.0		
Production Equipment	164	0.2	28	*		
Construction	17,327	1.4	16,648	1.6		
Construction Equipment	18	*	20	*		
Medical & Dental Supplies & Equipment	71	0.1	2,255	1.1		
Photographic Equipment & Supplies	379	0.4	347	0.2		
Materials Handling Equipment	60	0.2		0.0		
All Other Supplies & Equipment	18,356	2.4	15,693	1.1		
Services	119,983	5.7	151,471	5.8		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

FLORIDA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 645,478	2.6	\$ 583,237	2.3	\$ 782,591	3.2
Airframes & Related Assemblies & Spares	15,478	0.5	21,142	0.6	14,208	0.3
Aircraft Engines & Related Spares	22,299	1.9	14,503	1.3	17,011	1.5
Other Aircraft Equipment & Supplies	10,450	1.3	4,407	0.6	5,359	1.0
Missile and Space Systems	277,683	4.1	180,658	2.7	201,854	3.5
Ships	6,062	0.4	10,040	0.6	9,121	0.6
Combat Vehicles	147	*	613	0.1	153	*
Non-Combat Vehicles	368	0.1	1,599	0.4	1,955	0.5
Weapons	456	0.2	242	0.1	642	0.3
Ammunition	6,596	0.7	8,063	0.9	5,677	0.8
Electronics & Communication Equipment	56,639	1.7	56,292	1.8	77,872	2.6
Petroleum	4,494	0.5	5,343	0.6	5,128	0.7
Other Fuels & Lubricants	505	1.4	628	1.8	289	1.3
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	556	0.1	1,080	0.4	1,079	0.4
Military Building Supplies	30	0.1	15	*	63	0.3
Subsistence	18,129	2.8	19,179	3.3	21,857 ^c	3.8
Transportation Equipment		0.0		0.0	(-) 170 ^c	---
Production Equipment	541	0.5	1,698	1.7	385	0.6
Construction	52,107	4.3	92,855	8.3	241,131	18.6
Construction Equipment		0.0	720	0.6	29	*
Medical & Dental Supplies & Equipment	582	0.6	343	0.5	756	1.0
Photographic Equipment & Supplies	731	1.0	516	0.8	705	1.1
Materials Handling Equipment	424	1.0	105	0.2	381	0.7
All Other Supplies & Equipment	12,985	1.6	8,190	1.1	5,553	0.8
Services	158,216	10.2	155,006	8.5	171,553	7.7

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

FLORIDA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$633,332	2.7	\$766,955	2.4		
Airframes & Related Assemblies & Spares	10,719	0.3	28,304	0.6		
Aircraft Engines & Related Spares	24,567	2.2	32,461	1.5		
Other Aircraft Equipment & Supplies	6,324	0.9	15,107	1.5		
Missile and Space Systems	150,878	3.4	184,971	4.3		
Ships	7,644	0.4	16,794	1.2		
Combat Vehicles	257	0.1	167	*		
Non-Combat Vehicles	3,084	0.5	3,768	0.4		
Weapons	898	0.3	2,662	0.5		
Ammunition	6,112	0.8	16,600	0.6		
Electronics & Communication Equipment	55,207	1.9	92,460	2.4		
Petroleum	4,489	0.6	4,319	0.5		
Other Fuels & Lubricants	288	1.0	27	0.1		
Separately Procured Containers & Handling Equipment	364	4.7	217	3.1		
Textiles, Clothing & Equipage	5,361	1.5	3,646	0.3		
Military Building Supplies	(-) 13 $\frac{c}{d}$	---	4,749	1.3		
Subsistence	30,353	4.7	41,362	4.0		
Transportation Equipment		0.0		0.0		
Production Equipment	(-) 90 $\frac{c}{d}$	---	856	0.5		
Construction	155,573	12.2	115,241	11.5		
Construction Equipment	42	0.1		0.0		
Medical & Dental Supplies & Equipment	650	0.6	2,115	1.0		
Photographic Equipment & Supplies	334	0.3	14	*		
Materials Handling Equipment	242	0.7	199	0.2		
All Other Supplies & Equipment	6,680	0.9	5,935	0.4		
Services	163,369	7.8	194,981	7.5		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

GEORGIA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 337,478	1.4	\$ 423,290	1.7	\$ 520,169	2.1
Airframes & Related Assemblies & Spares	224,520	7.1	345,550	9.5	430,748	9.6
Aircraft Engines & Related Spares	2,138	0.2	110	*	221	*
Other Aircraft Equipment & Supplies	7,507	1.0	5,897	0.8	3,647	0.7
Missile and Space Systems	566	*	1,429	*	16,365	0.3
Ships	1,957	0.1	2,478	0.1	1,367	0.1
Combat Vehicles	21	*	187	*		0.0
Non-Combat Vehicles	4,923	1.0	363	0.1	1,360	0.3
Weapons	155	0.1	29	*	14	*
Ammunition	3,842	0.4	3,785	0.4	2,840	0.4
Electronics & Communication Equipment	2,668	0.1	2,038	0.1	1,910	0.1
Petroleum	1,562	0.2	1,664	0.2	1,615	0.2
Other Fuels & Lubricants	12	*	194	0.6		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	12,826	3.1	3,214	1.2	13,285	4.9
Military Building Supplies	2,227	9.6	888	2.1	25	0.1
Subsistence	16,157	2.5	13,108	2.2	10,518	1.8
Transportation Equipment		0.0		0.0		0.0
Production Equipment	12,395	12.1	9,687	9.2	138	0.2
Construction	21,911	1.8	14,540	1.3	17,788	1.4
Construction Equipment	223	0.2	1,698	1.5	65	0.1
Medical & Dental Supplies & Equipment	334	0.3	110	0.2	304	0.4
Photographic Equipment & Supplies	51	0.1	80	0.1	207	0.4
Materials Handling Equipment	(-) 18 ^{e/}	---	15	*	26	*
All Other Supplies & Equipment	9,035	1.1	5,512	0.8	4,779	0.7
Services	12,466	0.8	10,714	0.6	12,947	0.6

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

GEORGIA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$662,417	2.8	\$799,362	2.5		
Airframes & Related Assemblies & Spares	516,674	12.9	551,286	12.0		
Aircraft Engines & Related Spares	375	*	320	*		
Other Aircraft Equipment & Supplies	5,332	0.8	794	0.1		
Missile and Space Systems	7,985	0.2	1,566	*		
Ships	2,439	0.1	2,858	0.2		
Combat Vehicles	34	*	35	*		
Non-Combat Vehicles	385	*	469	*		
Weapons	815	0.3	1,816	0.4		
Ammunition	4,803	0.6	42,655	1.5		
Electronics & Communication Equipment	4,984	0.2	5,005	0.1		
Petroleum	1,661	0.2	1,541	0.2		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment	195	2.5	2,052	29.5		
Textiles, Clothing & Equipage	19,995	5.4	89,866	7.1		
Military Building Supplies	1,197	4.2	1,950	0.5		
Subsistence	12,514	1.9	16,269	1.6		
Transportation Equipment	86	15.1		0.0		
Production Equipment	53	0.1	448	0.2		
Construction	58,827	4.6	27,263	2.7		
Construction Equipment	47	0.1	5,391	2.5		
Medical & Dental Supplies & Equipment	79	0.1	943	0.4		
Photographic Equipment & Supplies	292	0.3	435	0.3		
Materials Handling Equipment	17	*	2,646	2.5		
All Other Supplies & Equipment	7,735	1.0	29,999	2.2		
Services	15,893	0.8	13,755	0.5		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

HAWAII

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 31,875	0.1	\$ 45,206	0.2	\$ 52,112	0.2
Airframes & Related Assemblies & Spares		0.0	187	*	279	*
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies	73	*		0.0	2,715	0.5
Missile and Space Systems	246	*		0.0	211	*
Ships	65	*		0.0	40	*
Combat Vehicles		0.0		0.0		0.0
Non-Combat Vehicles		0.0	12	*		0.0
Weapons		0.0		0.0		0.0
Ammunition		0.0		0.0		0.0
Electronics & Communication Equipment	926	*	694	*	805	*
Petroleum	3,514	0.4	3,043	0.4	98	*
Other Fuels & Lubricants	13	*		0.0	16	0.1
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage		0.0		0.0		0.0
Military Building Supplies	25	0.1	442	1.1	468	2.3
Subsistence	9,549	1.5	10,397	1.8	10,979	1.9
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0		0.0		0.0
Construction	8,896	0.7	18,762	1.7	20,296	1.6
Construction Equipment		0.0	27	*		0.0
Medical & Dental Supplies & Equipment	10	*	53	0.1	46	0.1
Photographic Equipment & Supplies		0.0	74	0.1		0.0
Materials Handling Equipment	33	0.1		0.0		0.0
All Other Supplies & Equipment	915	0.1	2,480	0.3	4,582	0.6
Services	7,610	0.5	9,035	0.5	11,577	0.5

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

HAWAII

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$72,213	0.3	\$64,170	0.2		
Airframes & Related Assemblies & Spares	492	*	516	*		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	4,003	0.6	198	*		
Missile and Space Systems	14	*	954	*		
Ships	1,090	0.1	1,016	0.1		
Combat Vehicles		0.0		0.0		
Non-Combat Vehicles	29	*	23	*		
Weapons		0.0		0.0		
Ammunition		0.0		0.0		
Electronics & Communication Equipment	1,027	*	1,356	*		
Petroleum	1,255	0.2	1,257	0.1		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage		0.0		0.0		
Military Building Supplies	201	0.7	974	0.3		
Subsistence	8,422	1.3	12,398	1.2		
Transportation Equipment		0.0		0.0		
Production Equipment		0.0		0.0		
Construction	39,861	3.1	21,687	2.2		
Construction Equipment	48	0.1	101	*		
Medical & Dental Supplies & Equipment		0.0	13	*		
Photographic Equipment & Supplies		0.0	28	*		
Materials Handling Equipment	41	0.1	25	*		
All Other Supplies & Equipment	2,669	0.3	2,346	0.2		
Services	13,061	0.6	21,278	0.8		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

IDAHO

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
(Value in Thousands)						
Total	\$ 26,121	0.1	\$ 8,634	*	\$ 7,804	*
Airframes & Related Assemblies & Spares		0.0		0.0		0.0
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies		0.0		0.0		0.0
Missile and Space Systems	63	*	691	*	52	*
Ships	51	*	49	*	33	*
Combat Vehicles		0.0		0.0		0.0
Non-Combat Vehicles		0.0		0.0		0.0
Weapons	53	*	(-) 13 ^{c/}	---		0.0
Ammunition	28	*		0.0		0.0
Electronics & Communication Equipment		0.0		0.0	100	*
Petroleum	760	0.1	138	*		0.0
Other Fuels & Lubricants		0.0		0.0		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage		0.0		0.0		0.0
Military Building Supplies		0.0		0.0		0.0
Subsistence	3,284	0.5	3,707	0.6	4,843	0.8
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0	20	*		0.0
Construction	20,973	1.7	2,329	0.2	1,841	0.1
Construction Equipment		0.0		0.0		0.0
Medical & Dental Supplies & Equipment		0.0		0.0		0.0
Photographic Equipment & Supplies		0.0		0.0		0.0
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	656	0.1	1,333	0.2	350	*
Services	253	*	380	*	585	*

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
IDAHO

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$11,724	0.1	\$20,004	*		
Airframes & Related Assemblies & Spares		0.0		0.0		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	116	*		0.0		
Missile and Space Systems		0.0		0.0		
Ships		0.0	38	*		
Combat Vehicles		0.0		0.0		
Non-Combat Vehicles	64	*		0.0		
Weapons	13	*		0.0		
Ammunition		0.0		0.0		
Electronics & Communication Equipment	202	*	10	*		
Petroleum		0.0		0.0		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage		0.0		0.0		
Military Building Supplies		0.0	1,075	0.3		
Subsistence	8,398	1.3	14,741	1.4		
Transportation Equipment		0.0		0.0		
Production Equipment		0.0		0.0		
Construction	1,898	0.1	1,005	0.1		
Construction Equipment		0.0		0.0		
Medical & Dental Supplies & Equipment		0.0		0.0		
Photographic Equipment & Supplies		0.0	10	*		
Materials Handling Equipment		0.0	66	0.1		
All Other Supplies & Equipment	394	0.1	2,525	0.2		
Services	639	*	534	*		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ILLINOIS

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 531,008	2.1	\$ 486,067	1.9	\$ 429,201	1.8
Airframes & Related Assemblies & Spares	15,984	0.5	18,325	0.5	7,940	0.2
Aircraft Engines & Related Spares	3,395	0.3	2,766	0.2	3,596	0.3
Other Aircraft Equipment & Supplies	21,719	2.8	22,881	3.3	22,332	4.0
Missile and Space Systems	19,208	0.3	13,148	0.2	7,667	0.1
Ships	10,984	0.7	11,175	0.6	12,117	0.8
Combat Vehicles	1,853	0.4	2,635	0.5	936	0.3
Non-Combat Vehicles	18,918	3.8	26,141	5.7	22,951	5.4
Weapons	4,826	2.2	13,045	6.0	7,445	3.5
Ammunition	46,350	5.0	36,662	4.1	39,203	5.8
Electronics & Communication Equipment	156,502	4.7	134,937	4.3	118,127	3.9
Petroleum	19,733	2.3	15,818	1.9	12,298	1.6
Other Fuels & Lubricants	745	2.0	1,651	4.8	1,528	6.7
Separately Procured Containers & Handling Equipment		0.0		0.0	18	1.1
Textiles, Clothing & Equipage	7,049	1.7	6,392	2.4	4,554	1.7
Military Building Supplies	1,788	7.7	4,747	11.5	2,883	14.4
Subsistence	54,647	8.6	39,898	6.8	29,554	5.1
Transportation Equipment	1,243	35.8	83	3.0	334	49.4
Production Equipment	1,990	1.9	4,428	4.2	2,697	4.5
Construction	19,030	1.6	15,027	1.3	14,672	1.1
Construction Equipment	28,558	30.8	31,437	28.3	42,814	46.6
Medical & Dental Supplies & Equipment	14,052	13.3	4,296	6.5	4,422	5.7
Photographic Equipment & Supplies	8,389	11.5	3,470	5.6	5,073	7.7
Materials Handling Equipment	8,463	20.7	18,962	28.6	8,780	16.3
All Other Supplies & Equipment	41,389	5.0	29,728	4.1	26,923	3.8
Services	24,193	1.6	28,415	1.6	30,337	1.4

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

ILLINOIS

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$421,899	1.8	\$919,779	2.9		
Airframes & Related Assemblies & Spares	6,818	0.2	4,213	0.1		
Aircraft Engines & Related Spares	2,221	0.2	6,695	0.3		
Other Aircraft Equipment & Supplies	17,639	2.6	36,506	3.6		
Missile and Space Systems	5,103	0.1	9,124	0.2		
Ships	6,026	0.3	25,335	1.8		
Combat Vehicles	1,959	0.7	6,846	1.2		
Non-Combat Vehicles	7,418	1.3	22,441	2.3		
Weapons	4,995	1.7	14,851	2.9		
Ammunition	42,181	5.4	209,915	7.4		
Electronics & Communication Equipment	121,658	4.1	167,112	4.4		
Petroleum	13,193	1.7	13,227	1.5		
Other Fuels & Lubricants	1,163	4.0	1,795	6.6		
Separately Procured Containers & Handling Equipment	90	1.1	11	0.2		
Textiles, Clothing & Equipage	7,218	2.0	22,632	1.8		
Military Building Supplies	7,385	26.0	45,526	12.6		
Subsistence	35,499	5.4	49,185	4.7		
Transportation Equipment	74	13.0	34	0.4		
Production Equipment	6,095	9.6	15,580	8.8		
Construction	26,710	2.1	23,673	2.4		
Construction Equipment	24,696	41.5	56,050	26.2		
Medical & Dental Supplies & Equipment	7,362	6.5	11,467	5.4		
Photographic Equipment & Supplies	4,441	4.5	8,111	5.0		
Materials Handling Equipment	7,431	20.7	29,125	27.9		
All Other Supplies & Equipment	31,628	4.2	107,935	7.8		
Services	32,896	1.6	32,390	1.2		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

INDIANA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 571,184	2.3	\$ 486,759	1.9	\$ 537,940	2.2
Airframes & Related Assemblies & Spares	10,778	0.3	6,449	0.2	7,423	0.2
Aircraft Engines & Related Spares	142,167	11.8	119,657	10.7	83,280	7.5
Other Aircraft Equipment & Supplies	13,339	1.7	13,564	1.9	2,716	0.5
Missile and Space Systems	52,552	0.8	60,913	0.9	55,636	1.0
Ships	2,650	0.2	2,250	0.1	1,687	0.1
Combat Vehicles	69,323	12.5	63,476	11.1	67,290	19.1
Non-Combat Vehicles	75,114	15.3	81,992	17.9	141,144	33.2
Weapons	6,438	2.9	1,153	0.5	2,031	0.9
Ammunition	57,286	6.2	45,881	5.1	35,830	5.3
Electronics & Communication Equipment	68,930	2.1	34,742	1.1	79,091	2.6
Petroleum	14,744	1.7	12,452	1.5	17,447	2.3
Other Fuels & Lubricants	660	1.8	697	2.0	792	3.6
Separately Procured Containers & Handling Equipment		0.0	30	3.9	24	1.5
Textiles, Clothing & Equipage	8,399	2.0	1,435	0.5	3,241	1.2
Military Building Supplies	33	0.1	168	0.4	15	*
Subsistence	13,746	2.1	10,542	1.8	10,478	1.8
Transportation Equipment		0.0	89	3.2	94	13.9
Production Equipment	1,371	1.3	2,813	2.7	1,791	3.0
Construction	5,785	0.5	1,697	0.2	3,447	0.3
Construction Equipment	1,254	1.4	784	0.7	466	0.5
Medical & Dental Supplies & Equipment	4,855	4.6	3,184	4.8	3,193	4.1
Photographic Equipment & Supplies	66	0.1	30	0.1	227	0.4
Materials Handling Equipment	732	1.8	497	0.7	489	0.9
All Other Supplies & Equipment	15,586	1.9	12,473	1.7	7,221	1.0
Services	5,376	0.3	9,791	0.5	12,887	0.6

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

INDIANA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$604,925	2.6	\$1,068,259	3.4		
Airframes & Related Assemblies & Spares	14,740	0.4	17,742	0.4		
Aircraft Engines & Related Spares	91,787	8.3	169,184	7.9		
Other Aircraft Equipment & Supplies	7,317	1.1	13,110	1.3		
Missile and Space Systems	47,409	1.0	23,275	0.5		
Ships	1,659	0.1	3,095	0.2		
Combat Vehicles	49,299	18.6	82,025	14.2		
Non-Combat Vehicles	200,057	34.0	322,824	32.9		
Weapons	2,895	1.0	9,555	1.9		
Ammunition	36,269	4.7	140,324	4.9		
Electronics & Communication Equipment	74,876	2.5	92,590	2.4		
Petroleum	24,098	3.1	19,147	2.2		
Other Fuels & Lubricants	462	1.6	636	2.3		
Separately Procured Containers & Handling Equipment	22	0.3	1,589	22.9		
Textiles, Clothing & Equipage	2,036	0.6	10,258	0.8		
Military Building Supplies	114	0.4	28,554	7.9		
Subsistence	13,059	2.0	26,408	2.5		
Transportation Equipment		0.0		0.0		
Production Equipment	1,794	2.8	5,593	3.1		
Construction	7,129	0.6	8,805	0.9		
Construction Equipment	2,504	4.2	32,222	15.1		
Medical & Dental Supplies & Equipment	5,960	5.3	14,821	6.9		
Photographic Equipment & Supplies	160	0.2	321	0.2		
Materials Handling Equipment	284	0.8	1,621	1.6		
All Other Supplies & Equipment	9,059	1.2	30,715	2.2		
Services	11,936	0.6	13,845	0.5		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

IOWA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 179,153	0.7	\$ 130,406	0.5	\$ 103,392	0.4
Airframes & Related Assemblies & Spares	2,328	0.1	2,488	0.1	1,140	*
Aircraft Engines & Related Spares	475	*	1,196	0.1	48	*
Other Aircraft Equipment & Supplies	6,856	0.9	6,662	0.9	3,479	0.6
Missile and Space Systems	548	*	149	*	74	*
Ships	1,218	0.1	1,123	0.1	320	*
Combat Vehicles	107	*	19	*	63	*
Non-Combat Vehicles	1,891	0.4	2,022	0.4	941	0.2
Weapons	498	0.2	435	0.2	201	*
Ammunition	42,390	4.6	12,838	1.4	12,106	1.8
Electronics & Communication Equipment	90,299	2.7	78,565	2.5	56,964	1.9
Petroleum	5,715	0.7	33	*	5,329	0.7
Other Fuels & Lubricants	22	0.1		0.0		0.0
Separately Procured Containers & Handling Equipment	15	1.4		0.0		0.0
Textiles, Clothing & Equipage	502	0.1	611	0.2	790	0.3
Military Building Supplies	24	0.1	88	0.2		0.0
Subsistence	16,271	2.6	18,195	3.1	14,163	2.4
Transportation Equipment		0.0		0.0		0.0
Production Equipment	30	*	38	*		0.0
Construction	3,422	0.3	1,138	0.1	1,775	0.1
Construction Equipment	1,429	1.6	620	0.6	1,837	2.0
Medical & Dental Supplies & Equipment	51	*	22	*	29	*
Photographic Equipment & Supplies	38	0.1	39	0.1	134	0.2
Materials Handling Equipment		0.0	17	*		0.0
All Other Supplies & Equipment	3,394	0.4	1,862	0.3	1,468	0.2
Services	1,630	0.1	2,246	0.1	2,531	0.1

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

IOWA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$133,951	0.6	\$247,619	0.8		
Airframes & Related Assemblies & Spares	655	*	746	*		
Aircraft Engines & Related Spares	352	*	318	*		
Other Aircraft Equipment & Supplies	5,857	0.9	9,301	0.9		
Missile and Space Systems	150	*	279	*		
Ships	443	*	438	*		
Combat Vehicles		0.0	176	*		
Non-Combat Vehicles	378	0.1	2,809	0.3		
Weapons	61	*	328	0.1		
Ammunition	16,518	2.1	49,830	1.8		
Electronics & Communication Equipment	77,496	2.6	129,806	3.4		
Petroleum	5,976	0.8		0.0		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	56	*	847	0.1		
Military Building Supplies		0.0		0.0		
Subsistence	19,459	3.0		3.4		
Transportation Equipment		0.0	35,520	0.0		
Production Equipment	169	0.3	68	*		
Construction	743	0.1	586	0.1		
Construction Equipment	159	0.3	6,301	3.0		
Medical & Dental Supplies & Equipment		0.0	248	0.1		
Photographic Equipment & Supplies		0.0		0.0		
Materials Handling Equipment	28	0.1	145	0.1		
All Other Supplies & Equipment	2,506	0.3	6,962	0.5		
Services	2,945	0.1	2,911	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

KANSAS

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 393,507	1.6	\$ 331,687	1.3	\$ 289,045	1.2
Airframes & Related Assemblies & Spares	200,588	6.3	235,121	6.4	190,356	4.2
Aircraft Engines & Related Spares	894	0.1	4,266	0.4	5,166	0.5
Other Aircraft Equipment & Supplies	105,694	13.6	3,253	0.5	7,696	1.4
Missile and Space Systems	3,411	*	21,796	0.3	14,111	0.2
Ships	826	0.1	28	*	220	*
Combat Vehicles	31	*	169	*		0.0
Non-Combat Vehicles	2,000	0.4	180	*	653	0.2
Weapons	21	*	107	*	141	*
Ammunition	3,746	0.4	9,798	1.1	10,376	1.6
Electronics & Communication Equipment	1,272	*	1,205	*	852	*
Petroleum	10,049	1.2	13,587	1.6	17,924	2.4
Other Fuels & Lubricants	1,374	3.8	679	2.0	116	0.5
Separately Procured Containers & Handling Equipment		0.0	38	4.9	29	1.8
Textiles, Clothing & Equipage	4,412	1.1	5,536	2.1	3,637	1.3
Military Building Supplies		0.0	329	0.8	666	3.3
Subsistence	8,636	1.4	8,462	1.4	8,085	1.4
Transportation Equipment		0.0		0.0		0.0
Production Equipment	1,255	1.2	915	0.9	1,059	1.8
Construction	38,496	3.2	16,488	1.5	19,147	1.5
Construction Equipment		0.0	23	*	206	0.2
Medical & Dental Supplies & Equipment	15	*	11	*	178	0.2
Photographic Equipment & Supplies	42	0.1		0.0	11	*
Materials Handling Equipment	68	0.2	192	0.3		0.0
All Other Supplies & Equipment	4,858	0.6	4,365	0.6	2,566	0.4
Services	5,819	0.4	5,139	0.3	5,850	0.3

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
KANSAS

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$229,051	1.0	\$312,629	1.0		
Airframes & Related Assemblies & Spares	162,636	4.1	170,804	3.7		
Aircraft Engines & Related Spares	3,167	0.3	6,105	0.3		
Other Aircraft Equipment & Supplies	3,907	0.6	6,824	0.7		
Missile and Space Systems	1,171	*	3,352	0.1		
Ships	146	*	55	*		
Combat Vehicles		0.0	107	*		
Non-Combat Vehicles	153	*	2,763	0.3		
Weapons	26	*	231	*		
Ammunition	454	0.1	46,955	1.6		
Electronics & Communication Equipment	2,110	0.1	3,053	0.1		
Petroleum	10,890	1.4	13,584	1.6		
Other Fuels & Lubricants	39	0.1	376	1.4		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	3,132	0.9	8,605	0.7		
Military Building Supplies	1,469	5.2	4,259	1.2		
Subsistence	9,295	1.4	13,015	1.2		
Transportation Equipment		0.0	293	3.9		
Production Equipment	760	1.2	3,003	1.7		
Construction	11,614	0.9	6,893	0.7		
Construction Equipment	63	0.1	64	*		
Medical & Dental Supplies & Equipment	319	0.3	791	0.4		
Photographic Equipment & Supplies		0.0	34	*		
Materials Handling Equipment	494	1.4	399	0.4		
All Other Supplies & Equipment	5,690	0.7	11,160	0.8		
Services	11,516	0.5	9,904	0.4		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

KENTUCKY

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 43,510	0.2	\$ 55,725	0.2	\$ 40,476	0.2
Airframes & Related Assemblies & Spares		0.0	142	*		0.0
Aircraft Engines & Related Spares	58	*	21	*		0.0
Other Aircraft Equipment & Supplies	22	*	231	*	289	0.1
Missile and Space Systems	158	*	101	*		0.0
Ships	1,794	0.1	467	*	1,673	0.1
Combat Vehicles	232	*	138	*	162	*
Non-Combat Vehicles	5,085	1.0	1,388	0.3	3,575	0.8
Weapons	170	0.1	188	0.1	204	*
Ammunition	505	0.1	251	*	518	0.1
Electronics & Communication Equipment	5,897	0.2	5,566	0.2	5,504	0.2
Petroleum	7,669	0.9	12,455	1.5	5,117	0.7
Other Fuels & Lubricants	1,228	3.4	1,135	3.3	977	4.4
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	3,993	1.0	6,237	2.3	1,747	0.6
Military Building Supplies		0.0		0.0		0.0
Subsistence	5,896	0.9	7,037	1.2	6,542	1.1
Transportation Equipment		0.0		0.0		0.0
Production Equipment	214	0.2	242	0.2	67	0.1
Construction	3,369	0.3	10,290	0.9	3,924	0.3
Construction Equipment	216	0.2	1,650	1.5	69	0.1
Medical & Dental Supplies & Equipment	70	0.1	266	0.4	329	0.4
Photographic Equipment & Supplies	11	*	42	0.1	24	*
Materials Handling Equipment	80	0.2	249	0.4		0.0
All Other Supplies & Equipment	3,130	0.4	3,183	0.4	4,862	0.7
Services	3,713	0.2	4,446	0.2	4,893	0.2

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

KENTUCKY

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$42,749	0.2	\$70,057	0.2		
Airframes & Related Assemblies & Spares	14	*		0.0		
Aircraft Engines & Related Spares		0.0	21	*		
Other Aircraft Equipment & Supplies	716	0.1	15	*		
Missile and Space Systems	13	*	31	*		
Ships	226	*	518	*		
Combat Vehicles	659	0.2	961	0.2		
Non-Combat Vehicles	5,649	1.0	8,161	0.8		
Weapons	245	0.1	94	*		
Ammunition	300	*	1,370	*		
Electronics & Communication Equipment	2,929	0.1	7,290	0.2		
Petroleum	2,263	0.3	3,567	0.4		
Other Fuels & Lubricants	1,274	4.3	657	2.4		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	3,659	1.0	10,591	0.8		
Military Building Supplies	431	1.5		0.0		
Subsistence	5,833	0.9	5,925	0.6		
Transportation Equipment		0.0		0.0		
Production Equipment	257	0.4	77	*		
Construction	8,263	0.6	11,632	1.2		
Construction Equipment	114	0.2	172	0.1		
Medical & Dental Supplies & Equipment	243	0.2	496	0.2		
Photographic Equipment & Supplies	40	*		0.0		
Materials Handling Equipment	100	0.3	426	0.4		
All Other Supplies & Equipment	4,665	0.6	12,224	0.9		
Services	4,856	0.2	5,829	0.2		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

LOUISIANA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 244,036	1.0	\$ 195,341	0.8	\$ 181,427	0.7
Airframes & Related Assemblies & Spares		0.0	209	*	2,166	0.1
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies		0.0	10	*	57	*
Missile and Space Systems	1,014	*	826	*	550	*
Ships	43,631	2.8	9,975	0.6	13,027	0.9
Combat Vehicles	258	*	25	*		
Non-Combat Vehicles	45	*	294	0.1	23	*
Weapons	199	0.1	799	0.4	72	*
Ammunition	32,470	3.5	21,870	2.5	9,957	1.5
Electronics & Communication Equipment	8,309	0.3	216	*	251	*
Petroleum	113,259	13.4	119,844	14.3	112,634	14.8
Other Fuels & Lubricants	99	0.3	92	0.3		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	2,510	0.6	595	0.2	1,593	0.6
Military Building Supplies		0.0	590	1.4	68	0.3
Subsistence	9,610	1.5	10,698	1.8	12,756	2.2
Transportation Equipment		0.0		0.0		0.0
Production Equipment	59	0.1	55	0.1	54	0.1
Construction	5,293	0.4	5,795	0.5	4,481	0.3
Construction Equipment		0.0	14	*	10	*
Medical & Dental Supplies & Equipment	145	0.1	16	*	82	0.1
Photographic Equipment & Supplies	55	0.1		0.0	18	*
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	5,814	0.7	1,470	0.2	3,018	0.4
Services	21,266	1.4	21,948	1.2	20,610	0.9

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

LOUISIANA

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$255,834	1.1	\$302,906	1.0		
Airframes & Related Assemblies & Spares	179	*	2,850	0.1		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	289	*	115	*		
Missile and Space Systems	197	*	38	*		
Ships	85,751	4.8	30,812	2.2		
Combat Vehicles	63	*	173	*		
Non-Combat Vehicles	41	*	58	*		
Weapons	159	0.1	11	*		
Ammunition	8,609	1.1	50,470	1.8		
Electronics & Communication Equipment	(-) 129c/	---	(-) 16 c/	---		
Petroleum	116,271	15.0	132,679	15.5		
Other Fuels & Lubricants	35	0.1	137	0.5		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	2,140	0.6	2,482	0.2		
Military Building Supplies	11	*	164	*		
Subsistence	9,749	1.5	15,088	1.4		
Transportation Equipment		0.0		0.0		
Production Equipment	54	0.1		0.0		
Construction	8,538	0.7	5,564	0.6		
Construction Equipment	18	*	253	0.1		
Medical & Dental Supplies & Equipment	126	0.1	333	0.2		
Photographic Equipment & Supplies	12	*	22	*		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	2,786	0.4	14,310	1.0		
Services	20,935	1.0	47,363	1.8		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MAINE

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 79,585	0.3	\$ 58,409	0.2	\$ 31,531	0.1
Airframes & Related Assemblies & Spares		0.0		0.0	50	*
Aircraft Engines & Related Spares	108	*	96	*	58	*
Other Aircraft Equipment & Supplies	49	*	10	*	44	*
Missile and Space Systems	180	*	290	*	14	*
Ships	51,817	3.3	35,360	2.0	7,894	0.5
Combat Vehicles		0.0	21	*	49	*
Non-Combat Vehicles	66	*	14	*	36	*
Weapons	7,541	3.4	7,080	3.3	6,518	3.1
Ammunition	418	*		0.0		0.0
Electronics & Communication Equipment	557	*	1,047	*	450	*
Petroleum	1,290	0.2	2,019	0.2	1,976	0.3
Other Fuels & Lubricants		0.0	48	0.1	13	0.1
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	1,539	0.4	2,298	0.9	5,037	1.9
Military Building Supplies		0.0		0.0		0.0
Subsistence	1,343	0.2	1,443	0.2	1,271	0.2
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0		0.0		0.0
Construction	9,658	0.8	3,806	0.3	4,920	0.4
Construction Equipment		0.0	35	*		0.0
Medical & Dental Supplies & Equipment	154	0.1	13	*	22	*
Photographic Equipment & Supplies		0.0		0.0		0.0
Materials Handling Equipment		0.0	20	*	37	*
All Other Supplies & Equipment	3,398	0.4	3,204	0.4	1,827	0.3
Services	1,467	0.1	1,605	0.1	1,315	*

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MAINE

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$68,771	0.3	\$51,340	0.2		
Airframes & Related Assemblies & Spares		0.0		0.0		
Aircraft Engines & Related Spares	391	*	29	*		
Other Aircraft Equipment & Supplies	303	*	23	*		
Missile and Space Systems	14	*	200	*		
Ships	48,425	2.7	2,481	0.2		
Combat Vehicles		0.0	696	0.1		
Non-Combat Vehicles	75	*	953	0.1		
Weapons	4,262	1.4	20,080	4.0		
Ammunition	54	*	24	*		
Electronics & Communication Equipment	759	*	965	*		
Petroleum	1,020	0.1	1,382	0.2		
Other Fuels & Lubricants	10	*	42	0.2		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	1,927	0.5	10,977	0.9		
Military Building Supplies		0.0	1,942	0.5		
Subsistence	1,880	0.3	1,802	0.2		
Transportation Equipment		0.0		0.0		
Production Equipment		0.0	18	*		
Construction	5,343	0.4	2,235	0.2		
Construction Equipment		0.0		0.0		
Medical & Dental Supplies & Equipment	89	0.1	98	*		
Photographic Equipment & Supplies		0.0		0.0		
Materials Handling Equipment	13	*		0.0		
All Other Supplies & Equipment	2,894	0.4	5,670	0.4		
Services	1,312	0.1	1,723	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MARYLAND

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 469,491	1.9	\$ 606,365	2.4	\$ 547,936	2.3
Airframes & Related Assemblies & Spares	5,508	0.2	7,811	0.2	5,960	0.1
Aircraft Engines & Related Spares	1,621	0.1	731	0.1	101	*
Other Aircraft Equipment & Supplies	9,950	1.3	6,582	0.9	19,560	3.5
Missile and Space Systems	125,318	1.8	205,748	3.0	169,526	2.9
Ships	11,787	0.8	22,165	1.3	17,910	1.2
Combat Vehicles	498	0.1	1,817	0.3	758	0.2
Non-Combat Vehicles	9,548	1.9	981	0.2	2,011	0.5
Weapons	3,032	1.4	6,736	3.1	5,699	2.7
Ammunition	14,840	1.6	17,081	1.9	14,188	2.1
Electronics & Communication Equipment	184,892	5.5	189,551	6.0	173,418	5.8
Petroleum	4,355	0.5	2,597	0.3	2,758	0.4
Other Fuels & Lubricants		0.0		0.0		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	1,057	0.3	1,466	0.6	909	0.3
Military Building Supplies	752	3.3	83	0.2	262	1.3
Subsistence	13,324	2.1	12,564	2.1	12,029	2.1
Transportation Equipment		0.0		0.0		0.0
Production Equipment	773	0.8	451	0.4	531	0.9
Construction	13,834	1.1	44,252	3.9	29,302	2.3
Construction Equipment	259	0.3	278	0.2	56	0.1
Medical & Dental Supplies & Equipment	1,733	1.6	523	0.8	485	0.6
Photographic Equipment & Supplies	574	0.8	464	0.7	395	0.6
Materials Handling Equipment	78	0.2	222	0.3		0.0
All Other Supplies & Equipment	25,634	3.1	35,587	4.8	19,473	2.7
Services	40,124	2.6	48,675	2.7	72,605	3.3

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MARYLAND

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$584,333	2.5	\$842,527	2.7		
Airframes & Related Assemblies & Spares	7,856	0.2	25,668	0.6		
Aircraft Engines & Related Spares	93	*	369	*		
Other Aircraft Equipment & Supplies	6,427	1.0	18,814	1.8		
Missile and Space Systems	171,347	3.9	193,295	4.5		
Ships	45,174	2.5	67,286	4.8		
Combat Vehicles	395	0.1	1,277	0.2		
Non-Combat Vehicles	4,380	0.8	23,300	2.4		
Weapons	6,174	2.0	4,457	0.9		
Ammunition	21,172	2.7	38,234	1.3		
Electronics & Communication Equipment	181,469	6.1	271,167	7.2		
Petroleum	2,971	0.4	3,348	0.4		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	2,298	0.6	18,192	1.4		
Military Building Supplies	273	1.0	20,400	5.7		
Subsistence	13,839	2.1	17,196	1.7		
Transportation Equipment		0.0		0.0		
Production Equipment	489	0.8	1,639	0.9		
Construction	29,712	2.3	44,202	4.4		
Construction Equipment	24	*	34	*		
Medical & Dental Supplies & Equipment	1,339	1.2	3,343	1.6		
Photographic Equipment & Supplies	779	0.8	1,306	0.8		
Materials Handling Equipment	78	0.2	2,930	2.8		
All Other Supplies & Equipment	19,031	2.5	21,806	1.6		
Services	69,013	3.3	64,264	2.5		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MASSACHUSETTS

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 1,310,055	5.2	\$ 1,060,165	4.2	\$ 1,032,062	4.2
Airframes & Related Assemblies & Spares	9,326	0.3	15,288	0.4	4,266	0.1
Aircraft Engines & Related Spares	111,944	9.3	114,478	10.3	117,319	10.5
Other Aircraft Equipment & Supplies	13,406	1.7	10,175	1.5	15,325	2.8
Missile and Space Systems	519,406	7.6	380,039	5.6	399,574	6.9
Ships	114,203	7.3	82,396	4.7	30,440	2.0
Combat Vehicles	550	0.1	1,201	0.2	289	0.1
Non-Combat Vehicles	1,385	0.3	1,648	0.4	2,067	0.5
Weapons	43,549	19.6	11,778	5.4	9,454	4.5
Ammunition	24,767	2.7	12,669	1.4	16,843	2.5
Electronics & Communication Equipment	220,586	6.6	219,239	7.0	182,337	6.1
Petroleum	4,648	0.6	4,183	0.5	4,303	0.6
Other Fuels & Lubricants	1,363	3.7	1,132	3.3	375	1.7
Separately Procured Containers & Handling Equipment		0.0		0.0	40	2.4
Textiles, Clothing & Equipage	21,893	5.2	13,099	4.9	12,806	4.7
Military Building Supplies	51	0.2	29	0.1	77	0.4
Subsistence	40,538	6.4	31,253	5.3	40,941	7.0
Transportation Equipment		0.0		0.0		0.0
Production Equipment	2,197	2.1	2,751	2.6	2,720	4.5
Construction	19,973	1.7	12,584	1.1	11,283	0.9
Construction Equipment	353	0.4	727	0.6	178	0.2
Medical & Dental Supplies & Equipment	3,478	3.3	3,453	5.2	4,580	5.9
Photographic Equipment & Supplies	1,729	2.4	721	1.2	2,373	3.6
Materials Handling Equipment	202	0.5	2,255	3.4	122	0.2
All Other Supplies & Equipment	29,960	3.6	23,863	3.2	18,422	2.6
Services	124,548	8.0	115,204	6.3	155,928	7.0

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
MASSACHUSETTS

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$1,178,729	5.1	\$1,335,952	4.2		
Airframes & Related Assemblies & Spares	4,177	0.1	3,159	0.1		
Aircraft Engines & Related Spares	120,903	11.0	204,777	9.5		
Other Aircraft Equipment & Supplies	12,963	1.9	18,997	1.8		
Missile and Space Systems	363,872	8.2	364,963	8.4		
Ships	188,578	10.6	181,717	12.9		
Combat Vehicles	200	0.1	1,521	0.3		
Non-Combat Vehicles	1,360	0.2	2,549	0.3		
Weapons	4,848	1.6	16,415	3.2		
Ammunition	17,550	2.3	39,504	1.4		
Electronics & Communication Equipment	263,926	8.9	246,828	6.5		
Petroleum	3,066	0.4	5,663	0.7		
Other Fuels & Lubricants	124	0.4	68	0.2		
Separately Procured Containers & Handling Equipment		0.0	27	0.4		
Textiles, Clothing & Equipage	16,258	4.4	63,338	5.0		
Military Building Supplies	96	0.3	1,014	0.3		
Subsistence	23,412	3.6	30,433	2.9		
Transportation Equipment	17	3.0		0.0		
Production Equipment	2,359	3.7	7,491	4.2		
Construction	17,546	1.4	11,384	1.1		
Construction Equipment	226	0.4	2,582	1.2		
Medical & Dental Supplies & Equipment	3,760	3.3	6,059	2.8		
Photographic Equipment & Supplies	1,809	1.8	2,305	1.4		
Materials Handling Equipment	372	1.0	1,278	1.2		
All Other Supplies & Equipment	16,584	2.2	37,656	2.7		
Services	114,723	5.5	86,224	3.3		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MICHIGAN

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 677,786	2.7	\$ 633,047	2.5	\$ 591,290	2.4
Airframes & Related Assemblies & Spares	9,465	0.3	11,483	0.3	7,516	0.2
Aircraft Engines & Related Spares	11,374	0.9	18,597	1.7	14,016	1.3
Other Aircraft Equipment & Supplies	29,804	3.8	29,402	4.2	32,071	5.8
Missile and Space Systems	32,941	0.5	14,997	0.2	45,298	0.8
Ships	44,961	2.9	38,104	2.2	21,000	1.4
Combat Vehicles	172,218	31.1	131,854	23.0	94,291	26.7
Non-Combat Vehicles	152,670	31.0	152,150	33.2	120,718	28.4
Weapons	6,227	2.8	7,950	3.7	6,326	3.0
Ammunition	7,674	0.8	9,098	1.0	16,859	2.5
Electronics & Communication Equipment	91,671	2.8	82,247	2.6	77,248	2.6
Petroleum	8,411	1.0	6,162	0.7	6,065	0.8
Other Fuels & Lubricants	42	0.1	141	0.4	33	0.1
Separately Procured Containers & Handling Equipment	62	5.6	116	14.9	36	2.2
Textiles, Clothing & Equipage	6,772	1.6	3,890	1.5	9,776	3.6
Military Building Supplies	2,526	10.9	822	2.0	136	0.7
Subsistence	8,221	1.3	6,464	1.1	9,821	1.7
Transportation Equipment	1,321	38.0	47	1.7	(-) 12	---
Production Equipment	2,060	2.0	7,505	7.2	2,546	4.2
Construction	18,518	1.5	11,870	1.1	17,062	1.3
Construction Equipment	12,046	13.0	38,248	34.4	19,722	21.5
Medical & Dental Supplies & Equipment	2,719	2.6	2,545	3.8	3,374	4.4
Photographic Equipment & Supplies	1,078	1.5	262	0.4	2	*
Materials Handling Equipment	5,497	13.4	7,641	11.5	12,104	22.4
All Other Supplies & Equipment	31,071	3.8	26,087	3.5	48,663	6.8
Services	18,437	1.2	25,365	1.4	26,619	1.2

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
MICHIGAN

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$532,897	2.3	\$918,426	2.9		
Airframes & Related Assemblies & Spares	10,583	0.3	10,503	0.2		
Aircraft Engines & Related Spares	12,832	1.2	15,290	0.7		
Other Aircraft Equipment & Supplies	23,827	3.6	70,833	6.9		
Missile and Space Systems	47,365	1.1	62,061	1.4		
Ships	5,635	0.3	12,756	0.9		
Combat Vehicles	88,278	33.2	179,211	31.0		
Non-Combat Vehicles	160,739	27.3	234,800	23.9		
Weapons	7,952	2.6	19,231	3.8		
Ammunition	13,182	1.7	31,203	1.1		
Electronics & Communication Equipment	59,126	2.0	47,032	1.2		
Petroleum	4,535	0.6	5,669	0.7		
Other Fuels & Lubricants	10	*	10	*		
Separately Procured Containers & Handling Equipment	24	0.3	56	0.8		
Textiles, Clothing & Equipage	4,318	1.2	16,811	1.3		
Military Building Supplies	772	2.7	3,124	0.9		
Subsistence	8,918	1.4	15,963	1.5		
Transportation Equipment	15	2.6	54	0.7		
Production Equipment	1,467	2.3	2,603	1.5		
Construction	10,754	0.9	6,021	0.6		
Construction Equipment	9,368	15.7	57,841	27.0		
Medical & Dental Supplies & Equipment	3,679	3.3	5,684	2.7		
Photographic Equipment & Supplies	17	*	62	*		
Materials Handling Equipment	5,687	15.9	4,874	4.7		
All Other Supplies & Equipment	25,036	3.3	64,751	4.7		
Services	28,778	1.4	51,983	2.0		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MINNESOTA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 297,306	1.2	\$ 273,757	1.1	\$ 217,941	0.9
Airframes & Related Assemblies & Spares	715	*	499	*	1,819	*
Aircraft Engines & Related Spares	998	0.1	434	*	219	*
Other Aircraft Equipment & Supplies	6,844	0.9	8,095	1.2	6,157	1.1
Missile and Space Systems	42,786	0.6	27,037	0.4	55,017	0.9
Ships	1,359	0.1	2,613	0.1	695	*
Combat Vehicles	558	0.1	1,179	0.2	152	*
Non-Combat Vehicles	862	0.2	433	0.1	3,272	0.8
Weapons	3,034	1.4	7,726	3.6	7,513	3.5
Ammunition	111,239	12.1	111,811	12.5	43,573	6.5
Electronics & Communication Equipment	75,024	2.3	49,264	1.6	43,190	1.4
Petroleum	2,900	0.4	3,186	0.4	3,553	0.5
Other Fuels & Lubricants		0.0		0.0		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	1,786	0.4	793	0.3	1,020	0.4
Military Building Supplies		0.0	2,020	4.9		0.0
Subsistence	18,407	2.9	16,020	2.8	15,386	2.6
Transportation Equipment		0.0		0.0	38	5.6
Production Equipment	357	0.3	956	0.9	422	0.7
Construction	3,123	0.3	5,882	0.5	2,189	0.2
Construction Equipment	3,324	3.6	525	0.5	49	0.1
Medical & Dental Supplies & Equipment	1,110	1.1	390	0.6	620	0.8
Photographic Equipment & Supplies	150	0.2	209	0.3	424	0.7
Materials Handling Equipment	7,505	18.3	984	1.5	47	0.1
All Other Supplies & Equipment	10,008	1.2	17,227	2.3	6,914	1.0
Services	5,217	0.3	16,474	0.9	25,672	1.2

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
MINNESOTA

(Value in Thousands)						
Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$259,500	1.1	\$497,994	1.6		
Airframes & Related Assemblies & Spares	1,141	*	1,049	*		
Aircraft Engines & Related Spares	547	0.1		0.0		
Other Aircraft Equipment & Supplies	10,324	1.5	24,949	2.4		
Missile and Space Systems	37,185	0.8	42,458	1.0		
Ships	2,195	0.1	2,656	0.2		
Combat Vehicles	704	0.3	731	0.1		
Non-Combat Vehicles	2,905	0.5	1,870	0.2		
Weapons	44,918	14.9	9,288	1.8		
Ammunition	31,952	4.1	190,507	6.7		
Electronics & Communication Equipment	50,744	1.7	75,898	2.0		
Petroleum	5,923	0.8	6,567	0.8		
Other Fuels & Lubricants	32	0.1		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	465	0.1	3,967	0.3		
Military Building Supplies	782	2.8	1,318	0.4		
Subsistence	21,348	3.3	37,927	3.6		
Transportation Equipment		0.0		0.0		
Production Equipment	1,061	1.7	3,287	1.9		
Construction	2,132	0.2	2,927	0.3		
Construction Equipment	702	1.2	3,423	1.6		
Medical & Dental Supplies & Equipment	717	0.6	976	0.5		
Photographic Equipment & Supplies	418	0.4	560	0.3		
Materials Handling Equipment	568	1.6	987	0.9		
All Other Supplies & Equipment	8,870	1.2	27,777	2.0		
Services	33,867	1.6	58,872	2.3		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MISSISSIPPI

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 100,220	0.4	\$ 186,039	0.7	\$ 155,911	0.6
Airframes & Related Assemblies & Spares	50	*	920	*	345	*
Aircraft Engines & Related Spares	63	*	319	*	123	*
Other Aircraft Equipment & Supplies	81	*	100	*	222	*
Missile and Space Systems	34	*	325	*	348	*
Ships	59,229	3.8	148,928	8.5	57,576	3.8
Combat Vehicles	12	*	4,291	0.7	170	0.1
Non-Combat Vehicles	10,451	2.1	1,600	0.4	689	0.2
Weapons	329	0.1	219	0.1	399	0.2
Ammunition	40	*	303	*	22	*
Electronics & Communication Equipment	999	*	2,187	0.1	1,434	*
Petroleum	1,845	0.2	2,242	0.3	10,963	1.4
Other Fuels & Lubricants	345	0.9	390	1.1	63	0.3
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	10,517	2.5	6,794	2.6	4,222	1.6
Military Building Supplies		0.0	99	0.2	172	0.9
Subsistence	6,216	1.0	3,921	0.7	5,072	0.9
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0	39	*		0.0
Construction	3,713	0.3	7,868	0.7	68,769	5.3
Construction Equipment	134	0.1	83	0.1	237	0.3
Medical & Dental Supplies & Equipment	819	0.8	662	1.0	402	0.5
Photographic Equipment & Supplies		0.0	(-) 16 ^{c/}	---		0.0
Materials Handling Equipment		0.0	215	0.3	(-) 4 ^{c/}	---
All Other Supplies & Equipment	2,343	0.3	1,978	0.3	1,333	0.2
Services	3,000	0.2	2,572	0.1	3,354	0.2

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MISSISSIPPI

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$152,188	0.7	\$162,305	0.5		
Airframes & Related Assemblies & Spares	851	*	2,133	*		
Aircraft Engines & Related Spares	211	*	603	*		
Other Aircraft Equipment & Supplies	1,438	0.2	5,459	0.5		
Missile and Space Systems	382	*	519	*		
Ships	57,092	3.2	47,507	3.4		
Combat Vehicles	26	*	378	0.1		
Non-Combat Vehicles	1,215	0.2	6,450	0.7		
Weapons	421	0.1	49	*		
Ammunition	1,737	0.2	3,240	0.1		
Electronics & Communication Equipment	1,255	*	3,666	0.1		
Petroleum	6,117	0.8	11,911	1.4		
Other Fuels & Lubricants	12	*		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	7,006	1.9	25,226	2.0		
Military Building Supplies	242	0.9	2,194	0.6		
Subsistence	9,390	1.4	21,744	2.1		
Transportation Equipment		0.0		0.0		
Production Equipment	235	0.4	31	*		
Construction	56,579	4.5	18,393	1.8		
Construction Equipment	2,592	4.4	3,700	1.7		
Medical & Dental Supplies & Equipment	1,180	1.0	1,144	0.5		
Photographic Equipment & Supplies		0.0		0.0		
Materials Handling Equipment		0.0	387	0.4		
All Other Supplies & Equipment	1,360	0.2	4,532	0.3		
Services	2,847	0.1	3,039	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MISSOURI

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 545,553	2.2	\$ 686,111	2.7	\$ 1,349,071	5.5
Airframes & Related Assemblies & Spares	290,888	9.2	477,802	13.1	1,143,010	25.4
Aircraft Engines & Related Spares	(-) 492 ^{c/}	---	195	*	1,314	0.1
Other Aircraft Equipment & Supplies	6,723	0.9	8,819	1.3	8,612	1.6
Missile and Space Systems	39,458	0.6	39,832	0.6	65,488	1.1
Ships	6,622	0.4	1,329	0.1	999	0.1
Combat Vehicles	464	0.1	109	*	322	0.1
Non-Combat Vehicles	3,184	0.6	3,386	0.7	3,819	0.9
Weapons	3,224	1.5	8,033	3.7	2,979	1.4
Ammunition	37,134	4.0	44,075	4.9	49,315	7.3
Electronics & Communication Equipment	19,262	0.6	16,246	0.5	9,649	0.3
Petroleum	3,905	0.5	9,156	1.1	1,697	0.2
Other Fuels & Lubricants	253	0.7	172	0.5	27	0.1
Separately Procured Containers & Handling Equipment		0.0	25	3.2	57	3.5
Textiles, Clothing & Equipage	9,222	2.2	3,018	1.1	6,430	2.4
Military Building Supplies	55	0.2	4,290	10.4	282	1.4
Subsistence	13,260	2.1	12,288	2.1	11,441	2.0
Transportation Equipment	172	5.0	181	6.5	14	2.1
Production Equipment	1,356	1.3	6,102	5.8	1,019	1.7
Construction	76,461	6.3	28,901	2.6	19,136	1.5
Construction Equipment	1,687	1.8	909	0.8	427	0.5
Medical & Dental Supplies & Equipment	3,056	2.9	622	0.9	538	0.7
Photographic Equipment & Supplies	1,748	2.4	2,193	3.5	105	0.2
Materials Handling Equipment	3,540	8.7	66	0.1		0.0
All Other Supplies & Equipment	15,570	1.9	8,394	1.1	7,271	1.0
Services	8,801	0.6	9,968	0.5	15,120	0.7

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MISSOURI

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$1,060,781	4.6	\$1,112,665	3.5		
Airframes & Related Assemblies & Spares	827,098	20.7	650,131	14.1		
Aircraft Engines & Related Spares	491	*	2,164	0.1		
Other Aircraft Equipment & Supplies	14,546	2.2	13,034	1.3		
Missile and Space Systems	47,796	1.0	102,848	2.4		
Ships	1,585	0.1	2,883	0.2		
Combat Vehicles	397	0.1	883	0.2		
Non-Combat Vehicles	12,689	2.2	10,816	1.1		
Weapons	18,578	6.2	31,161	6.1		
Ammunition	50,325	6.5	153,788	5.4		
Electronics & Communication Equipment	13,837	0.5	45,299	1.2		
Petroleum	1,824	0.2	2,151	0.2		
Other Fuels & Lubricants	30	0.1	30	0.1		
Separately Procured Containers & Handling Equipment	80	1.0		0.0		
Textiles, Clothing & Equipage	3,191	0.9	11,672	0.9		
Military Building Supplies	139	0.5	9,241	2.6		
Subsistence	10,235	1.6	18,913	1.8		
Transportation Equipment		0.0		0.0		
Production Equipment	859	1.3	189	*		
Construction	22,867	1.8	7,810	0.8		
Construction Equipment	266	0.4	250	0.1		
Medical & Dental Supplies & Equipment	1,612	1.4	2,289	1.1		
Photographic Equipment & Supplies	900	0.9	886	0.6		
Materials Handling Equipment		0.0	74	0.1		
All Other Supplies & Equipment	7,261	1.0	21,788	1.6		
Services	24,175	1.2	24,365	0.9		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MONTANA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 31,264	0.1	\$ 79,349	0.3	\$ 16,422	0.1
Airframes & Related Assemblies & Spares		0.0	86	*		0.0
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies		0.0		0.0		0.0
Missile and Space Systems	13,738	0.2	62,164	0.9	2,864	0.1
Ships		0.0		0.0		0.0
Combat Vehicles		0.0		0.0		0.0
Non-Combat Vehicles	15	*	46	*	62	*
Weapons	59	*		0.0		0.0
Ammunition		0.0		0.0		0.0
Electronics & Communication Equipment	647	*	1,892	0.1	783	*
Petroleum	3,252	0.4	1,898	0.2	2,912	0.4
Other Fuels & Lubricants	312	0.9	362	1.1	99	0.4
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage		0.0		0.0		0.0
Military Building Supplies		0.0		0.0		0.0
Subsistence	381	0.1	490	0.1	539	0.1
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0		0.0		0.0
Construction	11,127	0.9	11,249	1.0	7,656	0.6
Construction Equipment	686	0.7		0.0		0.0
Medical & Dental Supplies & Equipment	16	*		0.0		0.0
Photographic Equipment & Supplies		0.0	25	*		0.0
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	497	0.1	402	0.1	171	*
Services	534	*	735	*	1,336	*

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

MONTANA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$69,375	0.3	\$13,779	*		
Airframes & Related Assemblies & Spares		0.0		0.0		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies		0.0		0.0		
Missile and Space Systems	8,997	0.2	1,412	*		
Ships	10	*		0.0		
Combat Vehicles	23	*		0.0		
Non-Combat Vehicles	255	0.0	263	*		
Weapons		0.0		0.0		
Ammunition		0.0		0.0		
Electronics & Communication Equipment	723	*	1,182	*		
Petroleum	2,472	0.3	2,878	0.3		
Other Fuels & Lubricants	448	1.5	119	0.4		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage		0.0		0.0		
Military Building Supplies		0.0		0.0		
Subsistence	550	0.1	543	0.1		
Transportation Equipment		0.0		0.0		
Production Equipment		0.0	174	*		
Construction	52,660	4.1	4,170	0.4		
Construction Equipment		0.0	20	*		
Medical & Dental Supplies & Equipment		0.0		0.0		
Photographic Equipment & Supplies		0.0		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	385	0.1	522	*		
Services	2,852	0.1	2,496	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEBRASKA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 53,172	0.2	\$ 33,559	0.1	\$ 33,921	0.1
Airframes & Related Assemblies & Spares		0.0		0.0	(-)74 ^{5/}	---
Aircraft Engines & Related Spares		0.0	34	*		0.0
Other Aircraft Equipment & Supplies		0.0	125	*	11	*
Missile and Space Systems	423	*	98	*		0.0
Ships	369	*	94	*	14	*
Combat Vehicles		0.0	39	*	19	*
Non-Combat Vehicles	668	0.2	491	0.1	97	*
Weapons	76	*	86	*	53	*
Ammunition	3,463	0.4	1,280	0.2	(-)1,076 ^{5/}	---
Electronics & Communication Equipment	7,154	0.2	2,193	0.1	3,134	0.1
Petroleum	358	*	262	*	157	*
Other Fuels & Lubricants	701	1.9	604	1.8	15	0.1
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage		0.0		0.0		0.0
Military Building Supplies		0.0		0.0		0.0
Subsistence	9,904	1.5	13,084	2.2	12,403	2.1
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0		0.0		0.0
Construction	25,942	2.2	10,581	0.9	3,598	0.3
Construction Equipment	68	0.1		0.0		0.0
Medical & Dental Supplies & Equipment	814	0.8	616	0.9	671	0.9
Photographic Equipment & Supplies	10	*		0.0	26	*
Materials Handling Equipment		0.0	11	*		0.0
ALL Other Supplies & Equipment	1,516	0.2	623	0.1	849	0.1
Services:	1,706	0.1	3,338	0.2	14,024	0.6

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEBRASKA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$42,708	0.2	\$80,478	0.3		
Airframes & Related Assemblies & Spares	25	*	16	*		
Aircraft Engines & Related Spares		0.0	11	*		
Other Aircraft Equipment & Supplies		0.0		0.0		
Missile and Space Systems		0.0	101	*		
Ships	162	*		0.0		
Combat Vehicles	18	*	552	0.1		
Non-Combat Vehicles	204	*	10,204	1.0		
Weapons	80	*	728	0.1		
Ammunition	387	*	23,515	0.8		
Electronics & Communication Equipment	4,186	0.1	4,802	0.1		
Petroleum	195	*	153	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage		0.0	1,448	0.1		
Military Building Supplies		0.0		0.0		
Subsistence	13,731	2.1	20,530	2.0		
Transportation Equipment		0.0		0.0		
Production Equipment	48	0.1	10	*		
Construction	5,585	0.4	8,490	0.8		
Construction Equipment		0.0	44	*		
Medical & Dental Supplies & Equipment	1,127	1.0	2,383	1.1		
Photographic Equipment & Supplies	29	*		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	1,144	0.2	908	0.1		
Services	15,787	0.8	6,583	0.3		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEVADA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 8,246	*	\$ 13,143	0.1	\$ 6,361	*
Airframes & Related Assemblies & Spares		0.0	702	*	87	*
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies		0.0		0.0		0.0
Missile and Space Systems		0.0	90	*		0.0
Ships		0.0		0.0		0.0
Combat Vehicles	15	*	94	*		0.0
Non-Combat Vehicles		0.0	89	*		0.0
Weapons		0.0		0.0		0.0
Ammunition	219	*	1,218	0.1	160	*
Electronics & Communication Equipment	100	*		0.0		0.0
Petroleum	55	*	60	*	77	*
Other Fuels & Lubricants	214	0.6	171	0.5		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage		0.0		0.0		0.0
Military Building Supplies	20	0.1	11	*		0.0
Subsistence	294	*	474	0.1	471	0.1
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0		0.0		0.0
Construction	5,813	0.5	6,281	0.6	3,149	0.2
Construction Equipment		0.0	142	0.1		0.0
Medical & Dental Supplies & Equipment		0.0		0.0		0.0
Photographic Equipment & Supplies		0.0		0.0	15	*
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	290	*	2,141	0.3	159	*
Services	1,226	0.1	1,670	0.1	2,243	0.1

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEVADA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$19,142	0.1	\$32,028	0.1		
Airframes & Related Assemblies & Spares	(-) 17 ^{c/}	---	730	*		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies		0.0	79	*		
Missile and Space Systems		0.0		0.0		
Ships	32	*		0.0		
Combat Vehicles	40	*	45	*		
Non-Combat Vehicles		0.0		0.0		
Weapons		0.0		0.0		
Ammunition	74	*	53	*		
Electronics & Communication Equipment	885	*	455	*		
Petroleum	54	*	166	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage		0.0		0.0		
Military Building Supplies		0.0		0.0		
Subsistence	464	0.1	573	0.1		
Transportation Equipment		0.0		0.0		
Production Equipment		0.0		0.0		
Construction	4,809	0.4	3,293	0.3		
Construction Equipment		0.0	53	*		
Medical & Dental Supplies & Equipment		0.0		0.0		
Photographic Equipment & Supplies		0.0	36	*		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	2,822	0.4	5,636	0.4		
Services	9,979	0.5	20,909	0.8		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEW HAMPSHIRE

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 58,926	0.2	\$ 51,174	0.2	\$ 64,857	0.3
Airframes & Related Assemblies & Spares	19	*		0.0	22	*
Aircraft Engines & Related Spares		0.0		0.0	36	*
Other Aircraft Equipment & Supplies	262	*	110	*	85	*
Missile and Space Systems	467	*	681	*	909	*
Ships	466	*	1,186	0.1	2,441	0.2
Combat Vehicles		0.0		0.0		0.0
Non-Combat Vehicles		0.0		0.0		0.0
Weapons	3,786	1.7	786	0.4	319	0.2
Ammunition	142	*	58	*	32	*
Electronics & Communication Equipment	34,193	1.0	25,568	0.8	44,221	1.5
Petroleum	66	*	85	*	96	*
Other Fuels & Lubricants	214	0.6	181	0.5		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	8,890	2.1	14,800	5.6	9,773	3.6
Military Building Supplies		0.0		0.0		0.0
Subsistence	2,289	0.4	2,171	0.4	2,326	0.4
Transportation Equipment		0.0		0.0		0.0
Production Equipment	50	*	14	*		0.0
Construction	3,687	0.3	1,452	0.1	1,080	*
Construction Equipment		0.0		0.0		0.0
Medical & Dental Supplies & Equipment	312	0.3	178	0.3	113	0.1
Photographic Equipment & Supplies		0.0		0.0		0.0
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	400	*	557	0.1	1,945	0.3
Services	3,483	0.2	3,347	0.2	1,459	*

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
NEW HAMPSHIRE

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$52,400	0.2	\$109,591	0.3		
Airframes & Related Assemblies & Spares	284	*	416	*		
Aircraft Engines & Related Spares		0.0	32	*		
Other Aircraft Equipment & Supplies	420	0.1	5,269	0.5		
Missile and Space Systems	3,682	0.1	1,617	*		
Ships	1,196	0.1	1,104	0.1		
Combat Vehicles		0.0		0.0		
Non-Combat Vehicles		0.0	22	*		
Weapons	198	0.1	683	0.1		
Ammunition	24	*	35	*		
Electronics & Communication Equipment	26,504	0.9	66,927	1.8		
Petroleum	166	*	339	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	13,169	3.6	20,681	1.6		
Military Building Supplies		0.0		0.0		
Subsistence	1,278	0.2	5,423	0.5		
Transportation Equipment	40	7.0		0.0		
Production Equipment	85	0.1	89	*		
Construction	1,104	0.1	1,571	0.2		
Construction Equipment		0.0	15	*		
Medical & Dental Supplies & Equipment	99	0.1	162	0.1		
Photographic Equipment & Supplies	12	*		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	1,781	0.2	2,347	0.2		
Services	2,358	0.1	2,859	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEW JERSEY

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 1,063,096	4.3	\$1,251,608	5.0	\$ 917,561	3.8
Airframes & Related Assemblies & Spares	12,157	0.4	10,218	0.3	10,799	0.2
Aircraft Engines & Related Spares	114,598	9.6	59,748	5.3	29,679	2.7
Other Aircraft Equipment & Supplies	86,038	11.1	89,500	12.7	50,317	9.1
Missile and Space Systems	116,346	1.7	271,873	4.0	219,251	3.8
Ships	56,684	3.6	201,488	11.5	45,427	3.0
Combat Vehicles	1,309	0.3	2,122	0.4	1,141	0.3
Non-Combat Vehicles	3,022	0.6	2,241	0.5	1,498	0.4
Weapons	4,063	1.8	4,087	1.9	10,334	4.9
Ammunition	16,779	1.8	14,557	1.6	16,397	2.4
Electronics & Communication Equipment	439,440	13.2	419,877	13.4	332,638	11.0
Petroleum	30,232	3.6	19,014	2.3	19,397	2.5
Other Fuels & Lubricants	190	0.5	29	0.1	12	0.1
Separately Procured Containers & Handling Equipment	43	3.9	82	10.5	12	0.0
Textiles, Clothing & Equipage	27,977	6.7	15,458	5.8	21,433	7.9
Military Building Supplies	326	1.4	238	0.6	37	0.2
Subsistence	28,432	4.5	20,276	3.5	16,425	2.8
Transportation Equipment		0.0		0.0	16	2.4
Production Equipment	884	0.9	1,659	1.6	2,487	4.2
Construction	11,225	0.9	22,334	2.0	24,587	1.9
Construction Equipment	590	0.6	1,801	1.6	728	0.8
Medical & Dental Supplies & Equipment	10,984	10.4	7,163	10.7	9,486	12.2
Photographic Equipment & Supplies	1,682	2.3	2,115	3.4	5,392	8.2
Materials Handling Equipment	164	0.4	321	0.5	255	0.5
All Other Supplies & Equipment	59,190	7.2	47,129	6.4	53,946	7.5
Services	40,741	2.6	38,278	2.1	45,879	2.1

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEW JERSEY

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$820,309	3.5	\$1,090,122	3.4		
Airframes & Related Assemblies & Spares	5,074	0.1	7,929	0.2		
Aircraft Engines & Related Spares	28,461	2.6	77,247	3.6		
Other Aircraft Equipment & Supplies	63,653	9.5	96,654	9.4		
Missile and Space Systems	157,895	3.6	127,562	2.9		
Ships	33,482	1.9	30,829	2.2		
Combat Vehicles	1,279	0.5	1,093	0.2		
Non-Combat Vehicles	8,166	1.4	3,170	0.3		
Weapons	7,172	2.4	10,773	2.1		
Ammunition	14,420	1.9	73,905	2.6		
Electronics & Communication Equipment	297,535	10.0	338,855	9.0		
Petroleum	22,964	3.0	29,701	3.5		
Other Fuels & Lubricants	26	0.1	203	0.7		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	23,176	6.3	74,826	5.9		
Military Building Supplies	157	0.6	6,494	1.8		
Subsistence	20,132	3.1	25,332	2.4		
Transportation Equipment		0.0		0.0		
Production Equipment	1,241	2.0	2,741	1.5		
Construction	27,747	2.2	20,751	2.1		
Construction Equipment	456	0.8	3,164	1.5		
Medical & Dental Supplies & Equipment	13,405	11.9	23,189	10.8		
Photographic Equipment & Supplies	3,335	3.3	4,057	2.5		
Materials Handling Equipment	50	0.1	563	0.5		
All Other Supplies & Equipment	39,990	5.2	71,670	5.2		
Services	50,493	2.4	59,414	2.3		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEW MEXICO

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 60,729	0.2	\$ 61,642	0.2	\$ 71,486	0.3
Airframes & Related Assemblies & Spares	80	*	52	*	444	*
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies	28	*		0.0		0.0
Missile and Space Systems	1,657	*	4,065	0.1	7,601	0.1
Ships		0.0		0.0		0.0
Combat Vehicles		0.0		0.0		0.0
Non-Combat Vehicles	557	0.1	33	*		0.0
Weapons		0.0		0.0		0.0
Ammunition		0.0	125	*		0.0
Electronics & Communication Equipment	5,234	0.2	2,985	0.1	5,763	0.2
Petroleum	6,718	0.8	6,663	0.8	2,387	0.3
Other Fuels & Lubricants	433	1.2	355	1.0	94	0.4
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	1,692	0.4	525	0.2	96	*
Military Building Supplies		0.0		0.0		0.0
Subsistence	1,085	0.2	1,163	0.2	967	0.2
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0		0.0		0.0
Construction	19,635	1.6	19,446	1.7	26,003	2.0
Construction Equipment	31	*		0.0		0.0
Medical & Dental Supplies & Equipment		0.0		0.0		0.0
Photographic Equipment & Supplies	28	*	33	0.1	11	*
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	3,487	0.4	3,325	0.5	3,467	0.5
Services	20,064	1.3	22,872	1.2	24,653	1.1

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEW MEXICO

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$84,137	0.4	\$86,230	0.3		
Airframes & Related Assemblies & Spares	1,060	*	88	*		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	64	*	334	*		
Missile and Space Systems	3,596	0.1	5,773	0.1		
Ships		0.0	18	*		
Combat Vehicles	88	*		0.0		
Non-Combat Vehicles	291	0.1	567	0.1		
Weapons	73	*	180	*		
Ammunition	127	*	117	*		
Electronics & Communication Equipment	7,383	0.2	11,887	0.3		
Petroleum	604	0.1	729	0.1		
Other Fuels & Lubricants	57	0.2	57	0.2		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	1,014	0.3	4,681	0.4		
Military Building Supplies		0.0	53	*		
Subsistence	869	0.1	1,513	0.1		
Transportation Equipment		0.0		0.0		
Production Equipment		0.0		0.0		
Construction	28,374	2.2	18,471	1.8		
Construction Equipment		0.0	122	0.1		
Medical & Dental Supplies & Equipment		0.0		0.0		
Photographic Equipment & Supplies	45	*		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	6,794	0.9	8,995	0.6		
Services	33,698	1.6	32,645	1.3		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NEW YORK

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 2,668,744	10.7	\$2,500,146	9.9	\$2,496,438	10.2
Airframes & Related Assemblies & Spares	645,289	20.3	589,458	16.1	500,499	11.2
Aircraft Engines & Related Spares	13,336	1.1	8,357	0.7	9,370	0.8
Other Aircraft Equipment & Supplies	92,838	12.0	117,788	16.8	72,679	13.1
Missile and Space Systems	448,458	6.6	201,845	3.0	221,065	3.8
Ships	191,402	12.3	189,406	10.9	190,541	12.5
Combat Vehicles	2,278	0.4	1,835	0.3	1,711	0.5
Non-Combat Vehicles	13,865	2.8	5,351	1.2	4,722	1.1
Weapons	23,006	10.4	20,380	9.4	18,339	8.6
Ammunition	36,996	4.0	31,005	3.5	27,999	4.2
Electronics & Communication Equipment	667,613	20.0	627,505	19.9	603,002	20.0
Petroleum	35,219	4.2	36,402	4.3	43,430	5.7
Other Fuels & Lubricants	1,079	3.0	128	0.4	15	0.1
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	26,796	6.4	14,746	5.5	13,556	5.0
Military Building Supplies	208	0.9	80	0.2	205	1.0
Subsistence	37,667	5.9	47,004	8.0	36,973	6.4
Transportation Equipment	72	2.1		0.0		0.0
Production Equipment	4,165	4.1	3,895	3.7	2,980	5.0
Construction	42,025	3.5	47,191	4.2	22,775	1.8
Construction Equipment	2,668	2.9	3,424	3.1	2,454	2.7
Medical & Dental Supplies & Equipment	34,984	33.2	18,712	28.1	22,430	29.0
Photographic Equipment & Supplies	35,315	48.6	35,884	57.6	34,166	52.1
Materials Handling Equipment	2,555	6.3	696	1.0	706	1.3
All Other Supplies & Equipment	75,341	9.1	59,289	8.1	70,736	9.9
Services	235,569	15.2	439,765	24.0	596,085	26.9

ECONOMIC EFFECT OF VIETNAM SPENDING

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TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
NEW YORK

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$2,229,473	9.6	\$2,819,153	8.9		
Airframes & Related Assemblies & Spares	407,799	10.2	363,222	7.9		
Aircraft Engines & Related Spares	13,553	1.2	14,371	0.7		
Other Aircraft Equipment & Supplies	116,809	17.4	122,104	11.9		
Missile and Space Systems	227,551	5.1	244,114	5.6		
Ships	129,199	7.3	195,725	13.9		
Combat Vehicles	1,621	0.6	9,382	1.6		
Non-Combat Vehicles	22,311	3.8	22,750	2.3		
Weapons	34,241	11.4	29,702	5.9		
Ammunition	28,694	3.7	80,812	2.8		
Electronics & Communication Equipment	511,697	17.2	596,855	15.8		
Petroleum	41,802	5.4	43,438	5.1		
Other Fuels & Lubricants	10	*	5	*		
Separately Procured Containers & Handling Equipment		0.0	36	0.5		
Textiles, Clothing & Equipage	17,939	4.9	61,100	4.9		
Military Building Supplies	529	1.9	213	0.1		
Subsistence	46,247	7.1	53,677	5.1		
Transportation Equipment	14	2.5		0.0		
Production Equipment	2,312	3.6	4,982	2.8		
Construction	21,858	1.7	43,678	4.3		
Construction Equipment	816	1.4	2,881	1.4		
Medical & Dental Supplies & Equipment	30,800	27.3	66,249	30.9		
Photographic Equipment & Supplies	53,689	53.8	88,463	54.0		
Materials Handling Equipment	838	2.3	3,787	3.6		
All Other Supplies & Equipment	78,059	10.3	106,978	7.7		
Services	441,085	21.0	664,629	25.5		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NORTH CAROLINA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 268,990	1.1	\$ 258,987	1.0	\$ 273,516	1.1
Airframes & Related Assemblies & Spares	77	*	788	*	300	*
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies	566	0.1	260	*	670	0.1
Missile and Space Systems	117,630	1.7	137,150	2.0	133,480	2.3
Ships	2,081	0.1	2,104	0.1	3,062	0.2
Combat Vehicles	17	*		0.0		0.0
Non-Combat Vehicles	1,350	0.3	635	0.1	619	0.1
Weapons	771	0.3	1,260	0.6	974	0.5
Ammunition	5,796	0.6	4,428	0.5	4,351	0.6
Electronics & Communication Equipment	39,716	1.2	34,684	1.1	45,305	1.5
Petroleum	609	0.1	492	0.1	559	0.1
Other Fuels & Lubricants	60	0.2		0.0		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	62,209	14.8	34,366	12.9	30,982	11.4
Military Building Supplies		0.0		0.0		0.0
Subsistence	8,975	1.4	12,199	2.1	11,919	2.0
Transportation Equipment		0.0		0.0		0.0
Production Equipment	14	*	102	0.1	10	*
Construction	15,726	1.3	17,541	1.6	18,961	1.5
Construction Equipment	411	0.4	54	0.1	14	*
Medical & Dental Supplies & Equipment	184	0.2	196	0.3	165	0.2
Photographic Equipment & Supplies	40	0.1		0.0	326	0.5
Materials Handling Equipment	700	1.7	1,383	2.1	1,182	2.2
All Other Supplies & Equipment	6,681	0.8	5,057	0.7	8,330	1.2
Services	5,377	0.3	6,288	0.3	12,307	0.6

ECONOMIC EFFECT OF VIETNAM SPENDING

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TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
NORTH CAROLINA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$288,408	1.2	\$449,331	1.4		
Airframes & Related Assemblies & Spares	115	*	485	*		
Aircraft Engines & Related Spares	30	*	81	*		
Other Aircraft Equipment & Supplies	1,153	0.2	2,241	0.2		
Missile and Space Systems	128,473	2.9	107,141	2.5		
Ships	1,863	0.1	3,696	0.2		
Combat Vehicles	24	*	134	*		
Non-Combat Vehicles	3,113	0.5	3,707	0.4		
Weapons	7,860	2.6	3,815	0.8		
Ammunition	5,288	0.7	15,640	0.5		
Electronics & Communication Equipment	20,454	0.7	44,088	1.2		
Petroleum	385	*	261	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	57,198	15.5	171,033	13.6		
Military Building Supplies	20	0.1	1,057	0.3		
Subsistence	15,211	2.3	26,162	2.5		
Transportation Equipment		0.0		0.0		
Production Equipment		0.0	(-) 8 c	---		
Construction	22,540	1.8	19,705	2.0		
Construction Equipment	19	*	242	0.1		
Medical & Dental Supplies & Equipment	555	0.5	701	0.3		
Photographic Equipment & Supplies	22	*	247	0.2		
Materials Handling Equipment	832	2.3	3,287	3.2		
All Other Supplies & Equipment	12,813	1.7	32,883	2.4		
Services	10,440	0.5	12,733	0.5		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

NORTH DAKOTA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 99,627	0.4	\$ 64,855	0.3	\$ 192,025	0.8
Airframes & Related Assemblies & Spares		0.0		0.0		0.0
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies		0.0		0.0		0.0
Missile and Space Systems	10,802	0.2	18,666	0.3	37,083	0.6
Ships		0.0		0.0		0.0
Combat Vehicles		0.0		0.0		0.0
Non-Combat Vehicles		0.0		0.0		0.0
Weapons		0.0		0.0		0.0
Ammunition		0.0		0.0		0.0
Electronics & Communication Equipment		0.0	61	*	89	*
Petroleum	2,777	0.3	8,846	1.1	9,249	1.2
Other Fuels & Lubricants	419	1.2	380	1.1	182	0.8
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage		0.0		0.0		0.0
Military Building Supplies		0.0	14	*		0.0
Subsistence	346	0.1	59	*	542	0.1
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0	18	*		0.0
Construction	79,826	6.6	32,349	2.9	142,650	11.0
Construction Equipment		0.0		0.0		0.0
Medical & Dental Supplies & Equipment		0.0	10	*		0.0
Photographic Equipment & Supplies		0.0		0.0		0.0
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	1,486	0.2	1,259	0.2	220	*
Services	3,971	0.3	3,193	0.2	2,010	0.1

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
NORTH DAKOTA

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$48,997	0.2	\$83,113	0.3		
Airframes & Related Assemblies & Spares		0.0		0.0		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies		0.0		0.0		
Missile and Space Systems	28,327	0.6	34,319	0.8		
Ships		0.0		0.0		
Combat Vehicles		0.0		0.0		
Non-Combat Vehicles	211	*	393	*		
Weapons		0.0		0.0		
Ammunition		0.0		0.0		
Electronics & Communication Equipment	289	*	84	*		
Petroleum	2,326	0.3	1,977	0.2		
Other Fuels & Lubricants	194	0.7	206	0.7		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage		0.0		0.0		
Military Building Supplies		0.0		0.0		
Subsistence	639	0.1	714	0.1		
Transportation Equipment		0.0		0.0		
Production Equipment	866	1.4		0.0		
Construction	13,570	1.1	42,186	4.2		
Construction Equipment	22	*		0.0		
Medical & Dental Supplies & Equipment	11	*	10	*		
Photographic Equipment & Supplies		0.0		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	233	*	209	*		
Services	2,309	0.1	3,015	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

OHIO

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 1,129,017	4.5	\$ 1,345,686	5.3	\$ 1,028,946	4.2
Airframes & Related Assemblies & Spares	147,971	4.7	296,629	8.1	241,833	5.4
Aircraft Engines & Related Spares	216,110	18.0	323,631	29.0	293,645	26.2
Other Aircraft Equipment & Supplies	33,477	4.3	58,925	8.4	42,470	7.8
Missile and Space Systems	40,796	0.6	34,282	0.5	33,782	0.6
Ships	23,603	1.5	26,647	1.5	36,938	2.4
Combat Vehicles	79,781	14.4	170,506	29.7	64,163	18.2
Non-Combat Vehicles	135,562	27.5	111,508	24.3	58,162	13.7
Weapons	29,074	13.1	31,376	14.5	15,551	7.3
Ammunition	49,463	5.4	58,761	6.6	30,305	4.5
Electronics & Communication Equipment	183,274	5.5	35,302	1.1	34,649	1.2
Petroleum	20,417	2.4	20,390	2.4	23,059	3.0
Other Fuels & Lubricants	546	1.5	662	1.9	656	3.0
Separately Procured Containers & Handling Equipment	160	14.4		0.0	742	45.5
Textiles, Clothing & Equipage	3,087	0.7	3,976	1.5	1,569	0.6
Military Building Supplies	5,299	22.9	2,714	6.6	1,620	8.1
Subsistence	12,187	1.9	8,781	1.5	8,912	1.5
Transportation Equipment	13	0.4	986	35.1	(-) 15 ^{c/}	---
Production Equipment	19,958	19.5	16,165	15.4	11,413	19.0
Construction	19,948	1.7	24,093	2.2	21,497	1.7
Construction Equipment	11,239	12.1	10,205	9.2	4,868	5.3
Medical & Dental Supplies & Equipment	2,438	2.3	3,704	5.6	3,298	4.3
Photographic Equipment & Supplies	2,708	3.7	1,986	3.2	2,263	3.5
Materials Handling Equipment	3,725	9.1	5,351	8.1	6,151	11.4
All Other Supplies & Equipment	66,664	8.1	49,044	6.7	39,177	5.5
Services	21,517	1.4	50,062	2.7	52,238	2.4

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
OHIO

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
(Value in Thousands)						
Total	\$863,113	3.7	\$1,588,955	5.0		
Airframes & Related Assemblies & Spares	144,027	3.6	137,376	3.0		
Aircraft Engines & Related Spares	202,820	18.4	442,992	20.5		
Other Aircraft Equipment & Supplies	59,900	8.9	82,775	8.0		
Missile and Space Systems	53,599	1.2	44,038	1.0		
Ships	20,420	1.2	40,865	2.9		
Combat Vehicles	37,517	14.1	133,274	23.1		
Non-Combat Vehicles	72,110	12.3	175,081	17.9		
Weapons	20,087	6.7	25,878	5.1		
Ammunition	26,230	3.4	81,200	2.9		
Electronics & Communication Equipment	36,487	1.2	70,753	1.9		
Petroleum	22,551	2.9	17,214	2.0		
Other Fuels & Lubricants	719	2.5	1,006	3.7		
Separately Procured Containers & Handling Equipment	(-) 59 ^{e/}	---	165	2.4		
Textiles, Clothing & Equipage	4,014	1.1	9,187	0.7		
Military Building Supplies	4,101	14.5	49,899	13.8		
Subsistence	8,666	1.3	11,866	1.1		
Transportation Equipment	32	5.6	19	0.2		
Production Equipment	10,055	15.9	24,170	13.6		
Construction	23,346	1.8	15,612	1.6		
Construction Equipment	5,710	9.6	22,983	10.7		
Medical & Dental Supplies & Equipment	7,075	6.3	10,128	4.7		
Photographic Equipment & Supplies	2,341	2.4	8,589	5.3		
Materials Handling Equipment	6,024	16.8	19,232	18.4		
All Other Supplies & Equipment	39,740	5.2	103,129	7.4		
Services	55,601	2.7	61,524	2.4		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

OKLAHOMA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 135,825	0.5	\$ 111,204	0.5	\$ 122,489	0.5
Airframes & Related Assemblies & Spares	5,271	0.2	20,117	0.6	15,702	0.4
Aircraft Engines & Related Spares	3,607	0.3	2,978	0.3	3,852	0.3
Other Aircraft Equipment & Supplies	2,531	0.3	2,474	0.4	817	0.1
Missile and Space Systems	758	*	4,880	0.1	20,727	0.4
Ships	122	*	316	*	101	*
Combat Vehicles		0.0	671	0.1	425	0.1
Non-Combat Vehicles	763	0.2	2,243	0.5	3,490	0.8
Weapons	1,000	0.5	1,181	0.6	895	0.4
Ammunition		0.0	78	*	178	*
Electronics & Communication Equipment	1,644	*	1,710	0.1	10,261	0.3
Petroleum	38,997	4.6	29,021	3.5	26,524	3.5
Other Fuels & Lubricants	1,112	3.1	1,525	4.4	54	0.2
Separately Procured Containers & Handling Equipment	17	1.5	97	12.4	29	1.8
Textiles, Clothing & Equipage	4,559	1.1	1,994	0.7	2,015	0.7
Military Building Supplies	573	2.5	502	1.2		0.0
Subsistence	6,722	1.1	7,736	1.3	7,733	1.3
Transportation Equipment		0.0		0.0		0.0
Production Equipment	314	0.3	657	0.6	299	0.5
Construction	29,992	2.5	17,611	1.6	11,580	0.9
Construction Equipment	265	0.3	426	0.4	397	0.4
Medical & Dental Supplies & Equipment		0.0	43	0.1	61	0.1
Photographic Equipment & Supplies	27	*	92	0.1		0.0
Materials Handling Equipment		0.0	166	0.3	102	0.2
All Other Supplies & Equipment	4,758	0.6	2,516	0.3	8,557	1.2
Services	32,793	2.1	12,170	0.7	8,690	0.4

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

OKLAHOMA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$119,803	0.5	\$158,492	0.5		
Airframes & Related Assemblies & Spares	18,396	0.5	29,690	0.6		
Aircraft Engines & Related Spares	5,088	0.5	5,475	0.3		
Other Aircraft Equipment & Supplies	2,334	0.3	6,390	0.6		
Missile and Space Systems	8,606	0.2	2,992	0.1		
Ships	1,755	0.1	691	*		
Combat Vehicles	(-) 425 $\frac{1}{2}$	---	121	*		
Non-Combat Vehicles	1,647	0.3	1,253	0.1		
Weapons	969	0.3	1,202	0.2		
Ammunition	(-) 6 $\frac{1}{2}$	---	73	*		
Electronics & Communication Equipment	10,735	0.4	30,226	0.8		
Petroleum	28,610	3.7	26,654	3.1		
Other Fuels & Lubricants	96	0.3		0.0		
Separately Procured Containers & Handling Equipment		0.0	84	1.2		
Textiles, Clothing & Equipage	2,070	0.6	9,483	0.7		
Military Building Supplies	69	0.2	653	0.2		
Subsistence	8,970	1.4	9,667	0.9		
Transportation Equipment		0.0		0.0		
Production Equipment	328	0.5	273	0.1		
Construction	11,998	0.9	11,755	1.2		
Construction Equipment	187	0.3	629	0.3		
Medical & Dental Supplies & Equipment	24	*	94	*		
Photographic Equipment & Supplies	84	0.1		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	10,672	1.4	13,795	1.0		
Services	7,596	0.4	7,292	0.3		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

OREGON

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 46,129	0.2	\$ 41,777	0.2	\$ 29,104	0.1
Airframes & Related Assemblies & Spares		0.0		0.0	(-) 105 ^{2/}	---
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies	67	*		0.0	12	*
Missile and Space Systems	71	*	344	*	160	*
Ships	16,878	1.1	15,990	0.9	6,020	0.4
Combat Vehicles		0.0		0.0		0.0
Non-Combat Vehicles	80	*	17	*		0.0
Weapons	214	0.1	89	*	813	0.4
Ammunition	717	0.1	958	0.1	296	*
Electronics & Communication Equipment	3,194	0.1	4,846	0.2	2,353	0.1
Petroleum	235	*	150	*	158	*
Other Fuels & Lubricants		0.0		0.0		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	54	*		0.0		0.0
Military Building Supplies		0.0	43	0.1		0.0
Subsistence	5,302	0.8	5,086	0.9	6,068	1.0
Transportation Equipment		0.0		0.0		0.0
Production Equipment	327	0.3	137	0.1		0.0
Construction	3,740	0.3	3,125	0.3	2,398	0.2
Construction Equipment	685	0.7	73	0.1	142	0.2
Medical & Dental Supplies & Equipment		0.0	41	0.1	41	*
Photographic Equipment & Supplies	18	*		0.0		0.0
Materials Handling Equipment	133	0.3	628	0.9	1,069	2.0
All Other Supplies & Equipment	6,515	0.8	5,836	0.8	6,033	0.8
Services	7,899	0.5	4,414	0.2	3,646	0.2

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

OREGON

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$39,624	0.2	\$89,983	0.3		
Airframes & Related Assemblies & Spares	(-) 22 $\frac{2}{1}$	---	12	*		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	2,241	0.3	1,563	0.1		
Missile and Space Systems	482	*	158	*		
Ships	8,548	0.5	28,861	2.1		
Combat Vehicles		0.0	515	0.1		
Non-Combat Vehicles	34	*	37	*		
Weapons	1,074	0.3	7,070	1.4		
Ammunition	143	*	425	*		
Electronics & Communication Equipment	4,038	0.1	4,168	0.1		
Petroleum	191	*	224	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	178	*	131	*		
Military Building Supplies	199	0.7	1,520	0.4		
Subsistence	8,289	1.3	16,186	1.5		
Transportation Equipment		0.0		0.0		
Production Equipment	60	0.1	38	*		
Construction	1,130	0.1	853	0.1		
Construction Equipment	169	0.3	867	0.4		
Medical & Dental Supplies & Equipment	77	0.1	536	0.2		
Photographic Equipment & Supplies	30	*	29	*		
Materials Handling Equipment	644	1.8	1,828	1.8		
All Other Supplies & Equipment	9,517	1.2	22,585	1.6		
Services	2,602	0.1	2,377	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

PENNSYLVANIA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 952,058	3.8	\$ 887,452	3.5	\$ 883,065	3.6
Airframes & Related Assemblies & Spares	60,171	1.9	80,288	2.2	146,565	3.3
Aircraft Engines & Related Spares	6,051	0.5	4,659	0.4	5,246	0.5
Other Aircraft Equipment & Supplies	13,946	1.8	20,965	3.0	15,652	2.8
Missile and Space Systems	160,199	2.4	186,469	2.7	116,053	2.0
Ships	145,557	9.4	129,888	7.5	83,734	5.5
Combat Vehicles	63,813	11.5	5,567	1.0	19,069	5.4
Non-Combat Vehicles	9,479	1.9	8,197	1.8	8,167	1.9
Weapons	11,027	5.0	16,693	7.7	42,384	20.0
Ammunition	37,095	4.0	31,719	3.6	41,852	6.2
Electronics & Communication Equipment	184,087	5.5	160,205	5.1	129,821	4.3
Petroleum	16,532	2.0	16,822	2.0	10,293	1.4
Other Fuels & Lubricants	3,118	8.6	3,137	9.1	2,671	12.0
Separately Procured Containers & Handling Equipment	754	68.2	17	2.2	11	0.7
Textiles, Clothing & Equipage	36,462	8.7	20,025	7.5	20,300	7.5
Military Building Supplies	652	2.8	1,719	4.2	3,528	17.6
Subsistence	28,202	4.4	18,274	3.1	19,163	3.3
Transportation Equipment	270	7.8	1,176	41.9	82	12.1
Production Equipment	3,427	3.3	858	0.8	(-) 42 ^{5/}	---
Construction	25,714	2.1	15,997	1.4	22,301	1.7
Construction Equipment	3,464	3.8	8,176	7.4	1,205	1.3
Medical & Dental Supplies & Equipment	10,281	9.8	9,689	14.5	10,169	13.1
Photographic Equipment & Supplies	1,637	2.3	589	0.9	732	1.1
Materials Handling Equipment	1,698	4.2	6,472	9.8	9,806	18.2
All Other Supplies & Equipment	66,762	8.1	72,152	9.8	86,260	12.1
Services	61,660	4.0	67,699	3.7	88,043	4.0

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

PENNSYLVANIA

(Value in Thousands) Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$988,811	4.2	\$1,665,087	5.3		
Airframes & Related Assemblies & Spares	150,213	3.8	382,230	8.3		
Aircraft Engines & Related Spares	4,519	0.4	9,984	0.5		
Other Aircraft Equipment & Supplies	27,888	4.2	58,802	5.7		
Missile and Space Systems	131,798	3.0	157,132	3.6		
Ships	81,915	4.6	114,311	8.1		
Combat Vehicles	17,917	6.8	43,990	7.6		
Non-Combat Vehicles	18,097	3.1	30,615	3.1		
Weapons	34,585	11.5	42,178	8.3		
Ammunition	360,316	7.8	233,965	8.2		
Electronics & Communication Equipment	159,272	5.3	196,346	5.2		
Petroleum	17,386	2.2	18,944	2.2		
Other Fuels & Lubricants	4,108	13.9	3,579	13.1		
Separately Procured Containers & Handling Equipment	53	0.7		0.0		
Textiles, Clothing & Equipage	18,883	5.1	56,798	4.5		
Military Building Supplies	686	2.4	24,470	6.8		
Subsistence	21,389	3.3	20,905	2.0		
Transportation Equipment	45	7.9	7,162	94.7		
Production Equipment	2,020	3.2	19,758	11.1		
Construction	17,416	1.4	17,832	1.8		
Construction Equipment	702	1.2	4,280	2.0		
Medical & Dental Supplies & Equipment	15,486	13.7	25,643	12.0		
Photographic Equipment & Supplies	1,492	1.5	1,402	0.9		
Materials Handling Equipment	1,015	2.8	2,866	2.8		
All Other Supplies & Equipment	109,141	14.3	117,149	8.5		
Services	92,469	4.4	74,746	2.9		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

RHODE ISLAND

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 57,966	0.2	\$ 46,970	0.2	\$ 38,173	0.2
Airframes & Related Assemblies & Spares	150	*	513	*	45	*
Aircraft Engines & Related Spares	115	*	187	*	50	*
Other Aircraft Equipment & Supplies	3,043	0.4	427	0.1	951	0.2
Missile and Space Systems	590	*	425	*	162	*
Ships	7,448	0.5	2,873	0.2	1,784	0.1
Combat Vehicles		0.0	37	*		0.0
Non-Combat Vehicles	61	*	68	*	42	*
Weapons	1,527	0.7	979	0.5	504	0.2
Ammunition	1,129	0.1	402	*	3,840	0.6
Electronics & Communication Equipment	19,856	0.6	11,926	0.4	9,611	0.3
Petroleum	390	*	927	0.1	1,001	0.1
Other Fuels & Lubricants		0.0		0.0		0.0
Separately Procured Containers & Handling Equipment		0.0	238	30.5	56	3.4
Textiles, Clothing & Equipage	11,664	2.8	10,812	4.1	6,589	2.4
Military Building Supplies	29	0.1	13	*	12	*
Subsistence	1,590	0.2	1,249	0.2	1,376	0.2
Transportation Equipment		0.0		0.0		0.0
Production Equipment	473	0.5	642	0.6	225	0.4
Construction	2,731	0.2	7,150	0.6	4,769	0.4
Construction Equipment	152	0.2	12	*		0.0
Medical & Dental Supplies & Equipment	1,044	1.0	641	1.0	687	0.9
Photographic Equipment & Supplies	184	0.3	29	*		0.0
Materials Handling Equipment	11	*	31	*		0.0
All Other Supplies & Equipment	3,380	0.4	3,244	0.4	2,286	0.3
Services	2,399	0.2	4,145	0.2	4,183	0.2

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
RHODE ISLAND

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$86,323	0.4	\$131,722	0.4		
Airframes & Related Assemblies & Spares	145	*	93	*		
Aircraft Engines & Related Spares	69	*	167	*		
Other Aircraft Equipment & Supplies	190	*	526	0.1		
Missile and Space Systems	60	*	868	*		
Ships	2,673	0.1	4,243	0.3		
Combat Vehicles	31	*	67	*		
Non-Combat Vehicles		0.0		0.0		
Weapons	192	0.1	1,078	0.2		
Ammunition	296	*	8,043	0.3		
Electronics & Communication Equipment	27,244	0.9	32,984	0.9		
Petroleum	488	0.1	449	0.1		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment	1,148	14.8	38	0.5		
Textiles, Clothing & Equipage	17,120	4.7	45,435	3.6		
Military Building Supplies	31	0.1	86	*		
Subsistence	2,165	0.3	2,331	0.2		
Transportation Equipment		0.0		0.0		
Production Equipment	262	0.4	436	0.2		
Construction	14,856	1.2	4,085	0.4		
Construction Equipment	109	0.2	72	*		
Medical & Dental Supplies & Equipment	737	0.7	1,810	0.8		
Photographic Equipment & Supplies	113	0.1		0.0		
Materials Handling Equipment	277	0.8	137	0.1		
All Other Supplies & Equipment	12,671	1.7	23,817	1.7		
Services	5,446	0.3	4,957	0.2		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

SOUTH CAROLINA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 65,212	0.3	\$ 57,747	0.2	\$ 51,621	0.2
Airframes & Related Assemblies & Spares	2,488	0.1	1,432	*	1,218	*
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies	28	*	72	*		0.0
Missile and Space Systems		0.0	22	*	357	*
Ships	2,864	0.2	2,963	0.2	3,634	0.2
Combat Vehicles		0.0	15	*		0.0
Non-Combat Vehicles		0.0		0.0	43	*
Weapons	103	*		0.0		0.0
Ammunition	101	*	37	*	559	0.1
Electronics & Communication Equipment	563	*	525	*	232	*
Petroleum	589	0.1	1,033	0.1	641	0.1
Other Fuels & Lubricants	74	0.2	58	0.2		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	19,935	4.7	20,427	7.7	12,996	4.9
Military Building Supplies		0.0		0.0	24	0.1
Subsistence	3,012	0.5	3,550	0.6	3,021	0.5
Transportation Equipment	51	1.5	28	1.0		0.0
Production Equipment	364	0.4		0.0	19	*
Construction	29,571	2.5	22,263	2.0	22,708	1.8
Construction Equipment		0.0		0.0		0.0
Medical & Dental Supplies & Equipment	541	0.5	1,170	1.8	772	1.0
Photographic Equipment & Supplies		0.0		0.0		0.0
Materials Handling Equipment	11	*		0.0	38	0.1
All Other Supplies & Equipment	1,145	0.1	993	0.1	1,729	0.2
Services	3,772	0.2	3,159	0.2	3,630	0.2

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
SOUTH CAROLINA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$81,580	0.4	\$176,424	0.6		
Airframes & Related Assemblies & Spares	362	*	6,149	0.1		
Aircraft Engines & Related Spares		0.0	12	*		
Other Aircraft Equipment & Supplies	504	0.1	584	0.1		
Missile and Space Systems	190	*	400	*		
Ships	3,996	0.2	8,213	0.6		
Combat Vehicles		0.0	54	*		
Non-Combat Vehicles	21	*	145	*		
Weapons		0.0		0.0		
Ammunition	72	*	48	*		
Electronics & Communication Equipment	345	*	815	*		
Petroleum	203	*	204	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	20,601	5.6	118,096	9.4		
Military Building Supplies		0.0	24	*		
Subsistence	5,089	0.8	11,263	1.1		
Transportation Equipment	54	9.5	11	0.1		
Production Equipment		0.0		0.0		
Construction	40,074	3.2	21,380	2.1		
Construction Equipment	16	*	12	*		
Medical & Dental Supplies & Equipment	1,829	1.6	2,872	1.3		
Photographic Equipment & Supplies		0.0	48	*		
Materials Handling Equipment		0.0	72	0.1		
All Other Supplies & Equipment	1,157	0.2	2,514	0.2		
Services	7,067	0.3	3,508	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

SOUTH DAKOTA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 112,682	0.5	\$ 80,630	0.3	\$ 23,308	0.1
Airframes & Related Assemblies & Spares		0.0		0.0		0.0
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies		0.0		0.0		0.0
Missile and Space Systems	27,889	0.4	63,132	0.9	10,446	0.2
Ships		0.0		0.0		0.0
Combat Vehicles		0.0		0.0		0.0
Non-Combat Vehicles		0.0	16	*		0.0
Weapons		0.0	12	*		0.0
Ammunition		0.0		0.0	60	*
Electronics & Communication Equipment	21	*	305	*	230	*
Petroleum	628	0.1	15	*	18	*
Other Fuels & Lubricants	286	0.8	422	1.2		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage		0.0	50	*	37	*
Military Building Supplies		0.0		0.0		0.0
Subsistence	1,049	0.2	1,174	0.2	1,026	0.2
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0	11	*		0.0
Construction	81,474	6.8	14,474	1.3	9,828	0.8
Construction Equipment		0.0		0.0		0.0
Medical & Dental Supplies & Equipment	11	*	11	*	11	*
Photographic Equipment & Supplies		0.0		0.0		0.0
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	198	*	256	*	182	*
Services	1,126	0.1	752	*	1,470	0.1

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
SOUTH DAKOTA

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$21,062	0.1	\$23,315	0.1		
Airframes & Related Assemblies & Spares		0.0		0.0		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies		0.0	22	*		
Missile and Space Systems	11,309	0.3	13,601	0.3		
Ships		0.0		0.0		
Combat Vehicles		0.0	11	*		
Non-Combat Vehicles	242	*	227	*		
Weapons		0.0	28	*		
Ammunition		0.0	1,953	0.1		
Electronics & Communication Equipment	65	*	446	*		
Petroleum	183	*	14	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage		0.0	25	*		
Military Building Supplies		0.0		0.0		
Subsistence	1,586	0.2	2,234	0.2		
Transportation Equipment		0.0		0.0		
Production Equipment	52	0.1	33	*		
Construction	5,588	0.4	2,834	0.3		
Construction Equipment		0.0	64	*		
Medical & Dental Supplies & Equipment		0.0	11	*		
Photographic Equipment & Supplies		0.0		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	231	*	243	*		
Services	1,806	0.1	1,569	0.1		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

TENNESSEE

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 183,794	0.7	\$ 183,478	0.7	\$ 193,564	0.8
Airframes & Related Assemblies & Spares		0.0	283	*	764	*
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies	438	0.1	992	0.1	(-) 1 ^{e/}	---
Missile and Space Systems	1,027	*	48,527	0.7	54,308	0.9
Ships	3,530	0.2	682	*	890	*
Combat Vehicles	82	*		0.0	22	*
Non-Combat Vehicles	1,834	0.4	2,695	0.6	2,696	0.6
Weapons	718	0.3	243	0.1	716	0.3
Ammunition	46,960	5.1	35,643	4.0	39,110	5.8
Electronics & Communication Equipment	3,841	0.1	21,495	0.7	17,896	0.6
Petroleum	6,183	0.7	7,272	0.9	9,516	1.2
Other Fuels & Lubricants	345	0.9	357	1.0	172	0.8
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	33,432	8.0	20,139	7.6	27,557	10.1
Military Building Supplies		0.0	23	0.1		0.0
Subsistence	7,007	1.1	6,792	1.2	8,267	1.4
Transportation Equipment	64	1.8		0.0	(-) 53 ^{e/}	---
Production Equipment	261	0.3	4,113	3.9	155	0.3
Construction	17,147	1.4	7,810	0.7	9,321	0.7
Construction Equipment	27	*	137	0.1	57	0.1
Medical & Dental Supplies & Equipment	196	0.2	410	0.6	744	1.0
Photographic Equipment & Supplies	27	*	14	*		0.0
Materials Handling Equipment	422	1.0	314	0.5	367	0.7
All Other Supplies & Equipment	35,162	4.3	5,073	0.7	3,948	0.6
Services	25,091	1.6	20,464	1.1	17,112	0.8

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

TENNESSEE

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$197,283	0.8	\$502,168	1.6		
Airframes & Related Assemblies & Spares	581	*	596	*		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	(-) 1 ^c / ₂	---	99	*		
Missile and Space Systems	51,804	1.2	54,909	1.3		
Ships	3,451	0.2	1,191	0.1		
Combat Vehicles	34	*	442	0.1		
Non-Combat Vehicles	4,055	0.7	10,533	1.1		
Weapons	226	0.1	1,277	0.2		
Ammunition	45,986	5.9	201,660	7.1		
Electronics & Communication Equipment	13,499	0.5	28,079	0.7		
Petroleum	6,954	0.9	7,487	0.9		
Other Fuels & Lubricants	348	1.2	350	1.3		
Separately Procured Containers & Handling Equipment	13	0.1	19	0.3		
Textiles, Clothing & Equipage	28,156	7.7	99,328	7.9		
Military Building Supplies		0.0	10,635	3.0		
Subsistence	8,784	1.3	11,840	1.1		
Transportation Equipment		0.0		0.0		
Production Equipment	57	0.1	1,364	0.8		
Construction	6,554	0.5	31,710	3.2		
Construction Equipment	327	0.5	37	*		
Medical & Dental Supplies & Equipment	963	0.9	1,232	0.6		
Photographic Equipment & Supplies		0.0	10	*		
Materials Handling Equipment	498	1.4	868	0.8		
All Other Supplies & Equipment	6,143	0.8	12,134	0.9		
Services	18,851	0.9	26,368	1.0		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

TEXAS

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$1,006,253	4.0	\$ 1,203,123	4.8	\$ 1,294,431	5.3
Airframes & Related Assemblies & Spares	309,542	9.7	433,725	11.9	626,553	14.0
Aircraft Engines & Related Spares	9,727	0.8	11,100	1.0	12,747	1.2
Other Aircraft Equipment & Supplies	29,524	3.8	36,766	5.2	23,407	4.2
Missile and Space Systems	64,283	1.0	82,402	1.2	89,352	1.5
Ships	8,499	0.5	5,376	0.3	4,083	0.3
Combat Vehicles	1,134	0.2	972	0.2	495	0.1
Non-Combat Vehicles	5,074	1.0	7,031	1.5	7,732	1.8
Weapons	6,319	2.9	3,197	1.5	5,753	2.7
Ammunition	42,672	4.6	56,220	6.3	45,960	6.8
Electronics & Communication Equipment	84,355	2.5	104,391	3.3	99,280	3.3
Petroleum	246,080	29.2	229,533	27.4	180,866	23.7
Other Fuels & Lubricants	585	1.6	1,143	3.3	655	2.9
Separately Procured Containers & Handling Equipment		0.0		0.0	10	0.6
Textiles, Clothing & Equipage	16,300	3.9	9,465	3.6	8,284	3.0
Military Building Supplies	140	0.6	185	0.5	65	0.3
Subsistence	30,557	4.8	29,094	5.0	30,860	5.3
Transportation Equipment		0.0		0.0	16	2.4
Production Equipment	1,347	1.3	2,599	2.5	4,669	7.8
Construction	47,732	4.0	79,381	7.0	75,159	5.8
Construction Equipment	4,303	4.7	432	0.4	125	0.1
Medical & Dental Supplies & Equipment	879	0.8	576	0.9	975	1.3
Photographic Equipment & Supplies	1,411	1.9	236	0.4	153	0.2
Materials Handling Equipment	460	1.1	3,376	5.1		0.0
All Other Supplies & Equipment	44,078	5.3	41,675	5.7	18,903	2.6
Services	51,252	3.3	64,248	3.5	58,329	2.6

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

TEXAS

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$1,446,769	6.2	\$2,291,454	7.2		
Airframes & Related Assemblies & Spares	733,988	18.4	1,165,836	25.4		
Aircraft Engines & Related Spares	14,392	1.3	16,205	0.7		
Other Aircraft Equipment & Supplies	24,022	3.6	49,850	4.9		
Missile and Space Systems	60,735	1.4	49,960	1.1		
Ships	30,109	1.7	8,630	0.6		
Combat Vehicles	3,480	1.3	2,366	0.4		
Non-Combat Vehicles	632	0.1	5,153	0.5		
Weapons	8,646	2.9	16,655	3.3		
Ammunition	32,920	4.3	197,421	6.9		
Electronics & Communication Equipment	86,125	2.9	176,369	4.7		
Petroleum	204,701	26.4	241,875	28.2		
Other Fuels & Lubricants	6,564	22.3	4,015	14.7		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	11,491	3.1	59,277	4.7		
Military Building Supplies	310	1.1	12,042	3.3		
Subsistence	36,758	5.6	57,372	5.5		
Transportation Equipment	36	6.3		0.0		
Production Equipment	7,831	12.4	12,070	6.8		
Construction	88,303	6.9	66,204	6.6		
Construction Equipment	404	0.7	267	0.1		
Medical & Dental Supplies & Equipment	361	0.3	2,166	1.0		
Photographic Equipment & Supplies	134	0.1	1,367	0.8		
Materials Handling Equipment	94	0.3	1,882	1.8		
All Other Supplies & Equipment	31,839	4.2	53,132	3.8		
Services	62,894	3.0	91,340	3.5		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

UTAH

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 298,596	1.2	\$ 427,679	1.7	\$ 340,040	1.4
Airframes & Related Assemblies & Spares		0.0	173	*	203	*
Aircraft Engines & Related Spares	4,179	0.4		0.0		0.0
Other Aircraft Equipment & Supplies	518	0.1	219	*	53	*
Missile and Space Systems	260,259	3.8	377,309	5.5	292,489	5.0
Ships	159	*	491	*	704	*
Combat Vehicles	20	*	33	*		0.0
Non-Combat Vehicles	909	0.2	1,664	0.4	391	*
Weapons		0.0	33	*	268	0.1
Ammunition	290	*	985	0.1	4,661	0.7
Electronics & Communication Equipment	3,012	0.1	2,201	0.1	1,749	0.1
Petroleum	4,744	0.6	7,984	1.0	7,328	1.0
Other Fuels & Lubricants	503	1.4	460	1.3	266	1.2
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	(-) 14 ^c	---	119	*	23	*
Military Building Supplies		0.0	2,923	7.1	892	4.4
Subsistence	2,801	0.4	2,469	0.4	4,409	0.8
Transportation Equipment		0.0		0.0		0.0
Production Equipment	392	0.4	4,461	4.2	81	0.1
Construction	11,986	1.0	15,451	1.3	6,935	0.5
Construction Equipment	25	*	545	0.5	8,852	9.6
Medical & Dental Supplies & Equipment	11	*	13	*	14	*
Photographic Equipment & Supplies	82	0.1		0.0	64	0.1
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	5,464	0.7	5,406	0.8	3,376	0.5
Services	3,256	0.2	4,740	0.3	7,282	0.3

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

UTAH

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$191,173	0.8	\$169,681	0.5		
Airframes & Related Assemblies & Spares		0.0	288	*		
Aircraft Engines & Related Spares		0.0	15	*		
Other Aircraft Equipment & Supplies	61	*	17,577	1.7		
Missile and Space Systems	150,569	3.4	93,961	2.2		
Ships	1,728	0.1	1,557	0.1		
Combat Vehicles	10	*	508	0.1		
Non-Combat Vehicles	735	0.1	1,102	0.1		
Weapons	410	0.1	3,458	0.7		
Ammunition	4,033	0.5	4,533	0.2		
Electronics & Communication Equipment	4,070	0.1	3,824	0.1		
Petroleum	6,128	0.8	5,768	0.7		
Other Fuels & Lubricants	361	1.2	404	1.5		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	907	0.2	968	0.1		
Military Building Supplies	243	0.9	1,582	0.4		
Subsistence	3,815	0.6	4,488	0.4		
Transportation Equipment		0.0		0.0		
Production Equipment	33	0.1	170	0.1		
Construction	5,609	0.4	9,557	0.9		
Construction Equipment	102	0.2	2,221	1.0		
Medical & Dental Supplies & Equipment	74	0.1	26	*		
Photographic Equipment & Supplies	70	0.1	98	0.1		
Materials Handling Equipment	951	2.6	1,762	1.7		
All Other Supplies & Equipment	2,467	0.3	7,314	0.5		
Services	8,797	0.4	8,500	0.3		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

VERMONT

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 16,421	0.1	\$ 12,258	0.1	\$ 14,012	0.1
Airframes & Related Assemblies & Spares	858	*	656	*	688	*
Aircraft Engines & Related Spares		0.0	11	*	62	*
Other Aircraft Equipment & Supplies	570	0.1	1,291	0.2	787	0.1
Missile and Space Systems	1,257	*	718	*	123	*
Ships		0.0	12	*		0.0
Combat Vehicles	183	*	369	0.1	174	0.1
Non-Combat Vehicles		0.0		0.0	17	*
Weapons	9,080	4.1	6,901	3.2	9,274	4.4
Ammunition	1,563	0.2	107	*	590	0.1
Electronics & Communication Equipment	706	*	520	*	399	*
Petroleum	36	*	244	*	182	*
Other Fuels & Lubricants		0.0		0.0		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	355	0.1	1,758	0.7	425	0.2
Military Building Supplies		0.0		0.0		0.0
Subsistence		0.0		0.0	136	*
Transportation Equipment		0.0		0.0		0.0
Production Equipment	305	0.3	920	0.9	583	1.0
Construction	866	0.1	(-) 1,698 ^{c/}	---	148	*
Construction Equipment	14	*		0.0		0.0
Medical & Dental Supplies & Equipment		0.0	11	*		0.0
Photographic Equipment & Supplies		0.0		0.0	42	0.1
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	472	0.1	277	*	169	*
Services	156	*	161	*	213	*

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

VERMONT

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$32,202	0.1	\$81,066	0.3		
Airframes & Related Assemblies & Spares	656	*	37	*		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	471	0.1	1,543	0.1		
Missile and Space Systems	238	*	88	*		
Ships		0.0	106	*		
Combat Vehicles	171	0.1	997	0.2		
Non-Combat Vehicles	29	*	51	*		
Weapons	27,090	9.0	73,365	14.5		
Ammunition	172	*	300	*		
Electronics & Communication Equipment	382	*	668	*		
Petroleum	106	*	84	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	834	0.2	1,023	0.1		
Military Building Supplies		0.0		0.0		
Subsistence	426	0.1	186	*		
Transportation Equipment		0.0		0.0		
Production Equipment	738	1.2	1,603	0.9		
Construction	132	*	19	*		
Construction Equipment		0.0		0.0		
Medical & Dental Supplies & Equipment	141	0.1	117	0.1		
Photographic Equipment & Supplies		0.0		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	377	*	569	*		
Services	239	*	310	*		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

VIRGINIA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 446,183	1.8	\$ 484,989	1.9	\$ 690,852	2.8
Airframes & Related Assemblies & Spares	196	*	334	*	1,077	*
Aircraft Engines & Related Spares	61	*	181	*	19	*
Other Aircraft Equipment & Supplies	4,712	0.6	3,494	0.5	10,439	1.9
Missile and Space Systems	13,378	0.2	14,829	0.2	49,554	0.9
Ships	215,571	13.8	241,914	13.9	421,784	27.6
Combat Vehicles	1,070	0.2		0.0		0.0
Non-Combat Vehicles	5,670	1.2	529	0.1	3,257	0.8
Weapons	250	0.1	441	0.2	703	0.3
Ammunition	52,131	5.7	57,627	6.5	15,347	2.3
Electronics & Communication Equipment	36,510	1.1	43,169	1.4	48,539	1.6
Petroleum	2,644	0.3	2,391	0.3	1,826	0.2
Other Fuels & Lubricants	880	2.4	878	2.5	1,593	7.2
Separately Procured Containers & Handling Equipment		0.0	16	2.1	46	2.8
Textiles, Clothing & Equipage	22,482	5.3	5,448	2.0	8,563	3.1
Military Building Supplies	59	0.3	439	1.1	116	0.6
Subsistence	16,527	2.6	17,097	2.9	14,139	2.4
Transportation Equipment		0.0		0.0	43	6.4
Production Equipment	15	*		0.0	191	0.3
Construction	32,168	2.7	35,270	3.1	46,603	3.6
Construction Equipment	128	0.1	95	0.1	17	*
Medical & Dental Supplies & Equipment	1,255	1.2	1,107	1.7	1,114	1.4
Photographic Equipment & Supplies	514	0.7	377	0.6	600	0.9
Materials Handling Equipment	56	0.1	337	0.5	556	1.0
ALL Other Supplies & Equipment	12,732	1.5	11,870	1.6	11,088	1.5
Services	27,174	1.7	47,146	2.6	53,638	2.4

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
VIRGINIA

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$469,097	2.0	\$425,487	1.3		
Airframes & Related Assemblies & Spares	511	*	1,028	*		
Aircraft Engines & Related Spares	69	*	86	*		
Other Aircraft Equipment & Supplies	8,537	1.3	9,493	0.9		
Missile and Space Systems	9,897	0.2	11,586	0.3		
Ships	204,437	11.5	77,392	5.5		
Combat Vehicles		0.0	445	0.1		
Non-Combat Vehicles	269	*	1,044	0.1		
Weapons	1,129	0.4	828	0.2		
Ammunition	45,657	5.9	49,292	1.7		
Electronics & Communication Equipment	47,062	1.6	74,622	2.0		
Petroleum	2,247	0.3	1,776	0.2		
Other Fuels & Lubricants	2,397	8.1	2,145	7.8		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	11,556	3.1	37,725	3.0		
Military Building Supplies	37	0.1	3,774	1.0		
Subsistence	16,431	2.5	21,230	2.0		
Transportation Equipment		0.0		0.0		
Production Equipment	336	0.5	4,265	2.4		
Construction	48,793	3.8	40,570	4.0		
Construction Equipment	14	*	18	*		
Medical & Dental Supplies & Equipment	1,723	1.5	3,536	1.7		
Photographic Equipment & Supplies	1,243	1.3	2,016	1.2		
Materials Handling Equipment	207	0.6	875	0.8		
All Other Supplies & Equipment	6,938	0.9	16,686	1.2		
Services	59,607	2.8	65,055	2.5		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

WASHINGTON

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 921,115	3.7	\$ 1,041,581	4.1	\$ 1,085,696	4.5
Airframes & Related Assemblies & Spares	290,239	9.1	230,254	6.3	324,379	7.2
Aircraft Engines & Related Spares	3,825	0.3	5,229	0.5	9,378	0.8
Other Aircraft Equipment & Supplies	1,580	0.2	998	0.1	703	0.1
Missile and Space Systems	446,943	6.6	601,454	8.8	553,975	9.5
Ships	55,397	3.6	112,436	6.5	115,778	7.6
Combat Vehicles	6,050	1.1	2,166	0.4	4,826	1.4
Non-Combat Vehicles	224	*	98	*	157	*
Weapons	1,055	0.5	911	0.4	203	0.1
Ammunition	1,600	0.2	3,997	0.5	3,094	0.5
Electronics & Communication Equipment	3,693	0.1	2,700	0.1	4,259	0.1
Petroleum	17,775	2.1	8,544	1.0	7,725	1.0
Other Fuels & Lubricants	437	1.2	384	1.1	19	0.1
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	385	0.1	244	0.1	328	0.1
Military Building Supplies	301	1.3	504	1.2	122	0.6
Subsistence	14,604	2.3	12,325	2.1	14,265	2.4
Transportation Equipment	12	0.3		0.0	53	7.9
Production Equipment	2,935	2.9	5,776	5.5	85	0.1
Construction	42,292	3.5	23,876	2.1	14,815	1.1
Construction Equipment	143	0.2	70	0.1	129	0.1
Medical & Dental Supplies & Equipment	146	0.1	58	0.1	162	0.2
Photographic Equipment & Supplies	85	0.1		0.0		0.0
Materials Handling Equipment	21	0.1	68	0.1	1,348	2.5
All Other Supplies & Equipment	12,114	1.5	11,490	1.6	10,168	1.4
Services	19,259	1.2	17,999	1.0	19,725	0.9

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

WASHINGTON

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$545,607	2.3	\$444,368	1.4		
Airframes & Related Assemblies & Spares	11,061	0.3	21,829	0.5		
Aircraft Engines & Related Spares	9,226	0.8	8,839	0.4		
Other Aircraft Equipment & Supplies	1,270	0.2	10,072	1.0		
Missile and Space Systems	196,416	4.4	210,372	4.8		
Ships	225,586	12.7	39,058	2.8		
Combat Vehicles	2,251	0.8	1,846	0.3		
Non-Combat Vehicles	226	*	420	*		
Weapons	387	0.1	1,919	0.4		
Ammunition	5,036	0.7	10,034	0.4		
Electronics & Communication Equipment	5,526	0.2	6,322	0.2		
Petroleum	8,306	1.1	15,444	1.8		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	267	0.1	1,437	0.1		
Military Building Supplies		0.0	1,997	0.6		
Subsistence	14,997	2.3	31,561	3.0		
Transportation Equipment		0.0		0.0		
Production Equipment	205	0.3	696	0.4		
Construction	17,085	1.4	13,803	1.4		
Construction Equipment		0.0	462	0.2		
Medical & Dental Supplies & Equipment	14	*	159	0.1		
Photographic Equipment & Supplies		0.0	122	0.1		
Materials Handling Equipment	84	0.2	552	0.5		
All Other Supplies & Equipment	11,127	1.5	27,022	1.9		
Services	36,537	1.7	40,402	1.5		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

WEST VIRGINIA

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 144,313	0.6	\$ 162,201	0.7	\$ 87,327	0.4
Airframes & Related Assemblies & Spares		0.0	551	*	28	*
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies	1,060	0.1	123	*	657	0.1
Missile and Space Systems	71,762	1.1	13,357	0.2	20,541	0.4
Ships	9,531	0.6	670	*	810	*
Combat Vehicles	28,050	5.1	99,570	17.3	36,098	10.2
Non-Combat Vehicles	52	*	124	*	59	*
Weapons	1,183	0.5	5,740	2.7	2,083	1.0
Ammunition	317	*	19,022	2.1	2,518	0.4
Electronics & Communication Equipment	1,617	*	2,904	0.1	(-) 880 ^{e/}	---
Petroleum	630	0.1	566	0.1	282	*
Other Fuels & Lubricants	5,628	15.4	6,287	18.3	5,440	24.4
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	2,873	0.7	1,259	0.5	3,729	1.4
Military Building Supplies	978	4.2	(-) 241 ^{e/}	---		0.0
Subsistence	633	0.1	222	*	437	0.1
Transportation Equipment		0.0		0.0	89	13.2
Production Equipment	3,563	3.5	5,258	5.0		0.0
Construction	9,436	0.8	1,515	0.1	505	*
Construction Equipment	72	0.1		0.0		0.0
Medical & Dental Supplies & Equipment	350	0.3	151	0.2	523	0.8
Photographic Equipment & Supplies		0.0		0.0	16	*
Materials Handling Equipment		0.0		0.0	1,764	3.3
All Other Supplies & Equipment	5,617	0.7	5,183	0.7	12,334	1.7
Services	961	0.1	(-) 60 ^{e/}	---	294	*

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

WEST VIRGINIA

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$90,312	0.4	\$149,300	0.5		
Airframes & Related Assemblies & Spares	98	*	51	*		
Aircraft Engines & Related Spares		0.0	15	*		
Other Aircraft Equipment & Supplies	600	0.1	325	*		
Missile and Space Systems	10,170	0.2	9,900	0.2		
Ships	548	*	1,605	0.1		
Combat Vehicles	51,758	19.5	78,038	13.5		
Non-Combat Vehicles	2,898	0.5	4,675	0.5		
Weapons	592	0.2	2,267	0.5		
Ammunition	484	0.1	3,564	0.1		
Electronics & Communication Equipment	355	*	981	*		
Petroleum	294	*	2,433	0.3		
Other Fuels & Lubricants	4,755	16.1	4,393	16.1		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	8,694	2.4	16,143	1.3		
Military Building Supplies	776	2.7	300	0.1		
Subsistence	907	0.1	960	0.1		
Transportation Equipment	44	7.8		0.0		
Production Equipment	226	0.4		0.0		
Construction	409	*	133	*		
Construction Equipment	22	*	87	*		
Medical & Dental Supplies & Equipment	68	0.1	120	0.1		
Photographic Equipment & Supplies		0.0	14	*		
Materials Handling Equipment	267	0.7	33	*		
All Other Supplies & Equipment	5,986	0.8	23,036	1.7		
Services	361	*	227	*		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

WISCONSIN

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 258,735	1.0	\$ 219,427	0.9	\$ 177,217	0.7
Airframes & Related Assemblies & Spares	321	*	70	*	638	*
Aircraft Engines & Related Spares		0.0	150	*	29	*
Other Aircraft Equipment & Supplies	2,407	0.3	3,600	0.5	5,592	1.0
Missile and Space Systems	110,896	1.6	91,796	1.3	62,833	1.1
Ships	14,268	0.5	26,175	1.5	22,435	1.5
Combat Vehicles	1,876	0.4	968	0.2	709	0.2
Non-Combat Vehicles	2,654	0.5	7,964	1.7	2,340	0.5
Weapons	2,819	1.3	1,444	0.7	2,702	1.3
Ammunition	25,109	2.7	35,503	4.0	19,152	2.9
Electronics & Communication Equipment	41,014	1.2	16,864	0.5	8,538	0.3
Petroleum	243	*	142	*	137	*
Other Fuels & Lubricants		0.0		0.0		0.0
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage	7,357	1.8	3,758	1.4	3,606	1.3
Military Building Supplies	3,313	14.3	867	2.1	305	1.5
Subsistence	9,954	1.5	11,907	2.1	14,180	2.4
Transportation Equipment		0.0		0.0	18	2.7
Production Equipment	3,448	3.4	3,084	2.9	5,463	9.1
Construction	1,025	0.1	(-) 6,309	---	5,561	0.4
Construction Equipment	8,707	9.4	4,313	3.9	5,855	6.4
Medical & Dental Supplies & Equipment	2,623	2.5	894	1.3	859	1.1
Photographic Equipment & Supplies	409	0.6	53	0.1	80	0.1
Materials Handling Equipment	1,664	4.1	1,763	2.7	309	0.6
All Other Supplies & Equipment	14,239	1.7	11,564	1.6	9,211	1.3
Services	4,389	0.3	2,857	0.2	6,665	0.3

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE
WISCONSIN

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$203,003	0.9	\$364,684	1.1		
Airframes & Related Assemblies & Spares	856	*	336	*		
Aircraft Engines & Related Spares	58	*	73	*		
Other Aircraft Equipment & Supplies	9,378	1.4	10,415	1.0		
Missile and Space Systems	47,137	1.0	22,429	0.5		
Ships	26,389	1.5	23,925	1.7		
Combat Vehicles	781	0.3	2,582	0.5		
Non-Combat Vehicles	26,800	4.6	20,451	2.1		
Weapons	4,482	1.5	4,119	0.8		
Ammunition	21,338	2.8	128,778	4.5		
Electronics & Communication Equipment	8,400	0.3	12,730	0.3		
Petroleum	595	0.1	366	*		
Other Fuels & Lubricants		0.0		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage	5,986	1.6	17,306	1.4		
Military Building Supplies	28	0.1	750	0.2		
Subsistence	16,576	2.5	47,475	4.5		
Transportation Equipment		0.0		0.0		
Production Equipment	8,329	13.1	21,305	12.0		
Construction	1,270	0.1	2,838	0.3		
Construction Equipment	7,477	12.6	4,269	2.0		
Medical & Dental Supplies & Equipment	1,484	1.3	3,059	1.4		
Photographic Equipment & Supplies	157	0.2	71	*		
Materials Handling Equipment	3,653	10.2	2,845	2.7		
All Other Supplies & Equipment	4,472	0.6	31,031	2.2		
Services	7,357	0.4	7,531	0.3		

TABLE III

NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

WYOMING

(Value in Thousands)

Procurement Program	Fiscal Year 1962		Fiscal Year 1963		Fiscal Year 1964	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$ 22,551	0.1	\$ 125,081	0.5	\$ 49,408	0.2
Airframes & Related Assemblies & Spares	862	*	25	*	150	*
Aircraft Engines & Related Spares		0.0		0.0		0.0
Other Aircraft Equipment & Supplies	52	*	111	*	12	*
Missile and Space Systems	2,600	*	27,238	0.4	31,461	0.5
Ships		0.0		0.0		0.0
Combat Vehicles		0.0		0.0		0.0
Non-Combat Vehicles		0.0		0.0	11	*
Weapons		0.0		0.0		0.0
Ammunition		0.0		0.0		0.0
Electronics & Communication Equipment	173	*	569	*	504	*
Petroleum	5,402	0.6	5,474	0.6	6,773	0.9
Other Fuels & Lubricants	70	0.2	56	0.2	22	0.1
Separately Procured Containers & Handling Equipment		0.0		0.0		0.0
Textiles, Clothing & Equipage		0.0		0.0		0.0
Military Building Supplies		0.0		0.0		0.0
Subsistence	186	*	225	*	297	0.1
Transportation Equipment		0.0		0.0		0.0
Production Equipment		0.0		0.0	26	*
Construction	11,374	0.9	86,842	7.7	8,531	0.7
Construction Equipment		0.0		0.0		0.0
Medical & Dental Supplies & Equipment		0.0		0.0		0.0
Photographic Equipment & Supplies	12	*		0.0		0.0
Materials Handling Equipment		0.0		0.0		0.0
All Other Supplies & Equipment	104	*	222	*	57	*
Services	1,716	0.1	4,319	0.2	1,564	0.1

TABLE III
NET VALUE OF MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE

WYOMING

(Value in Thousands)

Procurement Program	Fiscal Year 1965		Fiscal Year 1966		Fiscal Year 1967	
	Value	% of U.S.	Value	% of U.S.	Value	% of U.S.
Total	\$7,867	*	\$11,112	*		
Airframes & Related Assemblies & Spares		0.0		0.0		
Aircraft Engines & Related Spares		0.0		0.0		
Other Aircraft Equipment & Supplies	41	*		0.0		
Missile and Space Systems	(-) 5,897 $\frac{1}{2}$	---	(-) 1,355 $\frac{1}{2}$	---		
Ships		0.0		0.0		
Combat Vehicles		0.0		0.0		
Non-Combat Vehicles	96	*	96	*		
Weapons		0.0		0.0		
Ammunition		0.0		0.0		
Electronics & Communication Equipment	101	*	33	*		
Petroleum	5,033	0.6	5,187	0.6		
Other Fuels & Lubricants	74	0.3		0.0		
Separately Procured Containers & Handling Equipment		0.0		0.0		
Textiles, Clothing & Equipage		0.0		0.0		
Military Building Supplies		0.0		0.0		
Subsistence	303	*	281	*		
Transportation Equipment		0.0		0.0		
Production Equipment		0.0	343	0.2		
Construction	6,571	0.5	5,231	0.5		
Construction Equipment		0.0		0.0		
Medical & Dental Supplies & Equipment		0.0		0.0		
Photographic Equipment & Supplies		0.0		0.0		
Materials Handling Equipment		0.0		0.0		
All Other Supplies & Equipment	154	*	82	*		
Services	1,391	0.1	1,214	*		

Footnotes for Tables I, II and III

- a/ Excludes the dollar value for work to be performed in classified locations.
- b/ Less than \$500 thousand.
- c/ The negative value results from contract cancellations in excess of new awards.
- * Less than 0.05%.
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PART - B

U. S. MILITARY PRIME CONTRACT AWARDS FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION WORK
BY REGION, STATE AND TYPE OF CONTRACTOR
FISCAL YEARS 1962 - 1966

TABLE IV
MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1962

Region and State	Type of Contractor							
	Total		Schools and Their Affiliates		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>U. S. TOTAL</u>	<u>\$6,113,112</u>	<u>100.0%</u>	<u>\$345,873</u>	<u>100.0%</u>	<u>\$139,583</u>	<u>100.0%</u>	<u>\$5,627,656</u>	<u>100.0%</u>
<u>NEW ENGLAND</u>	<u>443,889</u>	<u>7.3</u>	<u>120,837</u>	<u>34.9</u>	<u>1,151</u>	<u>0.8</u>	<u>321,901</u>	<u>5.7</u>
Maine	496	*	0	0.0	248	0.2	248	*
New Hampshire	8,204	0.1	407	0.1	0	0.0	7,797	0.1
Vermont	1,899	*	82	*	0	0.0	1,817	*
Massachusetts	361,973	5.9	117,111	33.8	680	0.5	244,182	4.3
Rhode Island	6,312	0.1	2,612	0.8	0	0.0	3,700	0.1
Connecticut	65,005	1.1	625	0.2	223	0.2	64,157	1.1
<u>MIDDLE ATLANTIC</u>	<u>1,194,079</u>	<u>19.5</u>	<u>39,762</u>	<u>11.5</u>	<u>16,595</u>	<u>11.9</u>	<u>1,137,722</u>	<u>20.2</u>
New York	664,844	10.9	24,741	7.1	10,560	7.6	629,543	11.2
New Jersey	293,237	4.7	4,045	1.2	-2b/	*	289,194	5.1
Pennsylvania	235,998	3.9	10,976	3.2	6,037	4.3	218,985	3.9
<u>EAST NORTH CENTRAL</u>	<u>350,641</u>	<u>5.7</u>	<u>49,646</u>	<u>14.4</u>	<u>4,530</u>	<u>3.2</u>	<u>296,465</u>	<u>5.3</u>
Ohio	132,603	2.2	7,137	2.1	3,870	2.8	121,596	2.2
Indiana	39,405	0.6	3,317	1.0	0	0.0	36,088	0.6
Illinois	56,296	0.9	27,085	7.8	445	0.3	28,766	0.5
Michigan	58,850	1.0	10,877	3.1	49	*	47,924	0.9
Wisconsin	63,487	1.0	1,230	0.4	166	0.1	62,091	1.1

NOTE: See Table VIII for footnotes.

TABLE IV (Continued)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
 TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1962

Region and State	Type of Contractor							
	Total		Schools and Their Affiliates		Other Non-Profit Institutions a/		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>WEST NORTH CENTRAL</u>	\$ 84,391	1.4%	\$ 3,662	1.0%	\$ 1,514	1.1%	\$ 79,215	1.4%
Minnesota	52,082	0.9	2,104	0.6	343	0.2	49,635	0.9
Iowa	5,563	0.1	532	0.2	0	0.0	5,031	0.1
Missouri	17,237	0.3	683	0.2	1,090	0.8	15,464	0.3
North Dakota	0	0.0	0	0.0	0	0.0	0	0.0
South Dakota	401	*	65	*	0	0.0	336	*
Nebraska	2,910	*	45	*	81	0.1	2,784	*
Kansas	6,198	0.1	233	0.1	0	0.0	5,965	0.1
<u>SOUTH ATLANTIC</u>	595,384	9.7	64,987	18.8	17,281	12.4	513,116	9.1
Delaware	11,756	0.2	286	0.1	0	0.0	11,470	0.2
Maryland	190,581	3.1	50,123	14.5	7,184	5.1	133,274	2.4
District of Columbia	23,783	0.4	6,606	1.9	7,508	5.4	9,669	0.2
Virginia	34,572	0.6	1,255	0.4	2,225	1.6	31,092	0.5
West Virginia	61,660	1.0	55	*	0	0.0	61,605	1.1
North Carolina	37,046	0.6	3,530	1.0	71	0.1	33,445	0.6
South Carolina	338	*	51	*	0	0.0	287	*
Georgia	4,686	0.1	1,366	0.4	81	0.1	3,239	0.1
Florida	230,962	3.8	1,715	0.5	212	0.1	229,035	4.1
<u>SOUTH CENTRAL</u>	126,397	2.1	8,016	2.3	11,592	8.3	106,789	1.9
Kentucky	716	*	120	*	45	*	551	*
Tennessee	33,583	0.6	552	0.2	280	0.2	32,751	0.6
Alabama	12,694	0.2	341	0.1	481	0.3	11,872	0.2
Mississippi	501	*	438	0.1	25	*	38	*
Arkansas	323	*	0	0.0	0	0.0	323	*
Louisiana	947	*	371	0.1	0	0.0	576	*
Oklahoma	4,402	0.1	961	0.3	24	*	3,417	0.1
Texas	73,231	1.2	5,233	1.5	10,737	7.7	57,261	1.0

TABLE IV (Continued)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
 TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1962

Region and State	Type of Contractor							
	Total		Schools and Their Affiliates		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>MOUNTAIN</u>	\$ 382,440	6.3%	\$ 10,987	3.2%	\$ 1,415	1.0%	\$ 370,038	6.6%
Montana	56	*	56	*	0	0.0	0	0.0
Idaho	-18 ^{b/}	*	0	0.0	-18 ^{b/}	*	0	0.0
Wyoming	1,160	*	0	0.0	0	0.0	1,160	*
Colorado	229,339	3.8	5,201	1.5	940	0.7	223,198	4.0
Utah	119,192	2.0	1,419	0.4	0	0.0	117,773	2.1
Nevada	65	*	0	0.0	0	0.0	65	*
New Mexico	13,752	0.2	3,829	1.1	398	0.3	9,525	0.2
Arizona	18,894	0.3	482	0.1	95	0.1	18,317	0.3
<u>PACIFIC</u>	2,933,681	48.0	46,249	13.4	85,505	61.3	2,801,927	49.8
Washington	492,787	8.1	3,009	0.9	58	*	489,720	8.7
Oregon	2,031	*	534	0.2	0	0.0	1,497	*
California	2,438,863	39.9	42,706	12.3	85,447	61.2	2,310,710	41.1
<u>ALASKA & HAWAII</u>	2,210	*	1,727	0.5	0	0.0	483	*
Alaska	1,558	*	1,558	0.4	0	0.0	0	0.0
Hawaii	652	*	169	0.1	0	0.0	483	*

TABLE V

MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1963

Region and State	Type of Contractor							
	Total		Schools and Their Affiliates		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>U. S. TOTAL</u>	<u>\$6,198,903</u>	<u>100.0%</u>	<u>\$381,864</u>	<u>100.0%</u>	<u>\$172,217</u>	<u>100.0%</u>	<u>\$5,644,822</u>	<u>100.0%</u>
<u>NEW ENGLAND</u>	<u>487,409</u>	<u>7.9</u>	<u>123,217</u>	<u>32.3</u>	<u>1,551</u>	<u>0.9</u>	<u>362,641</u>	<u>6.4</u>
Maine	207	*	0	0.0	105	0.1	102	*
New Hampshire	7,916	0.1	685	0.2	0	0.0	7,231	0.1
Vermont	4,698	0.1	130	*	0	0.0	4,568	0.1
Massachusetts	364,996	5.9	117,772	30.9	554	0.3	246,670	4.4
Rhode Island	6,124	0.1	3,602	0.9	16	*	2,506	*
Connecticut	103,468	1.7	1,028	0.3	876	0.5	101,564	1.8
<u>MIDDLE ATLANTIC</u>	<u>1,029,674</u>	<u>16.6</u>	<u>48,708</u>	<u>12.8</u>	<u>21,031</u>	<u>12.2</u>	<u>959,935</u>	<u>17.0</u>
New York	386,953	6.3	32,941	8.6	11,069	6.5	342,943	6.1
New Jersey	387,530	6.3	3,944	1.0	390	0.2	383,196	6.8
Pennsylvania	255,191	4.1	11,823	3.1	9,572	5.6	233,796	4.1
<u>EAST NORTH CENTRAL</u>	<u>314,794</u>	<u>5.1</u>	<u>51,343</u>	<u>13.4</u>	<u>6,106</u>	<u>3.6</u>	<u>257,345</u>	<u>4.6</u>
Ohio	90,978	1.5	8,516	2.2	5,133	3.0	77,329	1.4
Indiana	28,732	0.5	2,947	0.8	0	0.0	25,785	0.5
Illinois	57,991	0.9	26,367	6.9	662	0.4	30,962	0.5
Michigan	72,758	1.2	11,689	3.1	66	*	61,003	1.1
Wisconsin	64,335	1.0	1,824	0.5	245	0.1	62,266	1.1

NOTE: See Table VIII for footnotes.

TABLE V (Continued)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
 TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1963

Region and State	Type of Contractor							
	Total		Schools and Their Affiliates		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>WEST NORTH CENTRAL</u>	\$ 102,766	1.7%	\$ 3,954	1.0%	\$ 3,333	1.9%	\$ 95,479	1.7%
Minnesota	58,639	0.9	1,878	0.5	666	0.4	56,095	1.0
Iowa	4,058	0.1	739	0.2	0	0.0	3,319	0.1
Missouri	16,346	0.3	882	0.2	2,618	1.5	12,846	0.2
North Dakota	1,170	*	10	*	0	0.0	1,160	*
South Dakota	10,686	0.2	25	*	0	0.0	10,661	0.2
Nebraska	369	*	12	*	49	*	308	*
Kansas	11,498	0.2	408	0.1	0	0.0	11,090	0.2
<u>SOUTH ATLANTIC</u>	<u>581,360</u>	<u>9.4</u>	<u>82,890</u>	<u>21.7</u>	<u>29,103</u>	<u>16.9</u>	<u>469,367</u>	<u>8.3</u>
Delaware	26,186	0.4	204	0.1	0	0.0	25,982	0.5
Maryland	231,919	3.7	67,129	17.6	7,750	4.5	157,040	2.8
District of Columbia	36,213	0.6	7,965	2.1	19,015	11.1	9,233	0.2
Virginia	40,070	0.6	1,246	0.3	2,096	1.2	36,728	0.6
West Virginia	31,587	0.5	64	*	0	0.0	31,523	0.6
North Carolina	40,847	0.7	2,481	0.6	20	*	38,346	0.7
South Carolina	341	*	192	0.1	0	0.0	149	*
Georgia	2,606	*	1,154	0.3	187	0.1	1,265	*
Florida	171,591	2.8	2,455	0.6	35	*	169,101	3.0
<u>SOUTH CENTRAL</u>	<u>208,588</u>	<u>3.4</u>	<u>9,202</u>	<u>2.4</u>	<u>7,589</u>	<u>4.4</u>	<u>191,797</u>	<u>3.4</u>
Kentucky	998	*	376	0.1	0	0.0	622	*
Tennessee	45,396	0.7	699	0.2	3,507	2.1	41,190	0.7
Alabama	12,470	0.2	453	0.1	503	0.3	11,514	0.2
Mississippi	475	*	450	0.1	25	*	0	0.0
Arkansas	689	*	23	*	0	0.0	666	*
Louisiana	1,340	*	654	0.2	0	0.0	686	*
Oklahoma	5,958	0.1	1,271	0.3	72	*	4,615	0.1
Texas	141,262	2.3	5,276	1.4	3,482	2.0	132,504	2.3

TABLE V (Continued)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
 TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1963

Region and State	Type of Contractor							
	Total		Schools and Their Affiliates		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>MOUNTAIN</u>	\$ 566,224	9.1%	\$ 10,985	2.9%	\$ 4,999	2.9%	\$ 550,240	9.7%
Montana	3,101	0.1	78	*	0	0.0	3,023	0.1
Idaho	-49 ^{b/}	*	51	*	-100 ^{b/}	-0.1	0	0.0
Wyoming	1,484	*	0	0.0	0	0.0	1,484	*
Colorado	254,346	4.1	3,462	0.9	4,438	2.6	246,446	4.4
Utah	137,366	2.2	2,985	0.8	0	0.0	134,381	2.4
Nevada	1,429	*	0	0.0	0	0.0	1,429	*
New Mexico	17,424	0.3	3,692	1.0	641	0.4	13,091	0.2
Arizona	151,123	2.4	717	0.2	20	*	150,386	2.7
<u>PACIFIC</u>	2,905,908	46.8	49,955	13.1	98,260	57.1	2,757,693	48.9
Washington	337,174	5.5	4,786	1.3	104	0.1	332,284	5.9
Oregon	1,718	*	749	0.2	0	0.0	969	*
California	2,567,016	41.4	44,420	11.6	98,156	57.0	2,424,440	42.9
<u>ALASKA & HAWAII</u>	2,180	*	1,610	0.4	245	0.1	325	*
Alaska	1,559	*	1,255	0.3	245	0.1	59	*
Hawaii	621	*	355	0.1	0	0.0	266	*

TABLE VI
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
 TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR
 FISCAL YEAR 1964

Region and State	Type of Contractor							
	Total		Schools and Their Affiliates		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>U. S. TOTAL</u>	<u>\$5,764,904</u>	<u>100.0%</u>	<u>\$442,190</u>	<u>100.0%</u>	<u>\$208,077</u>	<u>100.0%</u>	<u>\$5,114,637</u>	<u>100.0%</u>
<u>NEW ENGLAND</u>	<u>558,221</u>	<u>9.7</u>	<u>152,117</u>	<u>34.4</u>	<u>2,566</u>	<u>1.2</u>	<u>403,538</u>	<u>7.9</u>
Maine	139	*	0	0.0	0	0.0	139	*
New Hampshire	11,309	0.2	450	0.1	0	0.0	10,859	0.2
Vermont	8,067	0.1	166	*	0	0.0	7,901	0.2
Massachusetts	408,961	7.1	146,752	33.2	1,570	0.8	260,639	5.1
Rhode Island	6,836	0.1	3,490	0.8	30	*	3,316	0.1
Connecticut	122,909	2.1	1,259	0.3	966	0.5	120,684	2.4
<u>MIDDLE ATLANTIC</u>	<u>895,388</u>	<u>15.6</u>	<u>58,741</u>	<u>13.3</u>	<u>23,193</u>	<u>11.2</u>	<u>813,454</u>	<u>15.9</u>
New York	389,851	6.8	39,187	8.9	2,076	1.0	348,588	6.8
New Jersey	310,150	5.4	4,839	1.1	7,826	3.8	297,485	5.8
Pennsylvania	195,387	3.4	14,715	3.3	13,291	6.4	167,381	3.3
<u>EAST NORTH CENTRAL</u>	<u>309,223</u>	<u>5.4</u>	<u>56,183</u>	<u>12.7</u>	<u>10,160</u>	<u>4.9</u>	<u>242,880</u>	<u>4.7</u>
Ohio	83,628	1.5	8,588	2.0	9,487	4.6	65,553	1.3
Indiana	57,378	1.0	3,651	0.8	0	0.0	53,727	1.0
Illinois	43,750	0.8	23,938	5.4	433	0.2	19,379	0.4
Michigan	83,358	1.5	17,946	4.1	31	*	65,381	1.3
Wisconsin	41,109	0.7	2,060	0.5	209	0.1	38,840	0.8

NOTE: See Table VIII for footnotes.

TABLE VI (Continued)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
 TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1964

Region and State	Type of Contractor							
	Total		Schools and Their Affiliates		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
WEST NORTH CENTRAL	<u>\$162,563</u>	<u>2.8%</u>	<u>\$ 4,175</u>	<u>0.9%</u>	<u>\$ 6,043</u>	<u>2.9%</u>	<u>\$ 152,345</u>	<u>3.0%</u>
Minnesota	57,273	1.0	1,824	0.4	199	0.1	55,250	1.1
Iowa	2,320	*	1,202	0.3	0	0.0	1,118	*
Missouri	54,874	1.0	910	0.2	5,743	2.8	48,221	0.9
North Dakota	30,558	0.5	0	0.0	0	0.0	30,558	0.6
South Dakota	8,170	0.1	80	*	0	0.0	8,090	0.2
Nebraska	124	*	23	*	101	*	0	0.0
Kansas	9,244	0.2	136	*	0	0.0	9,108	0.2
SOUTH ATLANTIC	<u>665,548</u>	<u>11.5</u>	<u>82,164</u>	<u>18.6</u>	<u>22,840</u>	<u>11.0</u>	<u>560,544</u>	<u>11.0</u>
Delaware	6,249	0.1	434	0.1	0	0.0	5,815	0.1
Maryland	217,772	3.8	60,280	13.7	2,429	1.2	155,063	3.0
District of Columbia	31,683	0.5	7,545	1.7	14,060	6.8	10,078	0.2
Virginia	58,255	1.0	2,310	0.5	7,754	3.7	48,191	0.9
West Virginia	17,083	0.3	34	*	-1,722 ^{b/}	-0.8	18,771	0.4
North Carolina	57,378	1.0	6,736	1.5	0	0.0	50,642	1.0
South Carolina	274	*	58	*	0	0.0	216	*
Georgia	19,632	0.3	1,503	0.3	238	0.1	17,891	0.3
Florida	257,222	4.5	3,264	0.7	81	*	253,877	5.0
SOUTH CENTRAL	<u>344,168</u>	<u>6.0</u>	<u>10,380</u>	<u>2.4</u>	<u>4,465</u>	<u>2.1</u>	<u>329,323</u>	<u>6.4</u>
Kentucky	975	*	548	0.1	0	0.0	427	*
Tennessee	45,534	0.8	522	0.1	151	0.1	44,861	0.9
Alabama	13,630	0.2	457	0.1	624	0.3	12,549	0.2
Mississippi	500	*	459	0.1	41	*	0	0.0
Arkansas	248	*	83	*	0	0.0	165	*
Louisiana	1,104	*	554	0.1	0	0.0	550	*
Oklahoma	21,002	0.4	1,725	0.4	117	*	19,160	0.4
Texas	261,175	4.5	6,032	1.4	3,532	1.7	251,611	4.9

TABLE VI (Continued)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
 TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1964

Region and State	Type of Contractor							
	Total		Schools and Their Affiliates		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>MOUNTAIN</u>	\$ 386,282	6.7%	\$ 12,057	2.7%	\$ 6,989	3.4%	\$ 367,236	7.2%
Montana	3,180	0.1	18	*	0	0.0	3,162	0.1
Idaho	0	0.0	0	0.0	0	0.0	0	0.0
Wyoming	36,210	0.6	0	0.0	0	0.0	36,210	0.7
Colorado	225,555	3.9	6,352	1.4	1,144	0.5	218,059	4.2
Utah	53,345	0.9	1,515	0.3	0	0.0	51,830	1.0
Nevada	427	*	30	*	153	0.1	244	*
New Mexico	23,127	0.4	3,356	0.8	5,162	2.5	14,609	0.3
Arizona	44,438	0.8	786	0.2	530	0.3	43,122	0.8
<u>PACIFIC</u>	<u>2,441,215</u>	<u>42.3</u>	<u>64,196</u>	<u>14.5</u>	<u>131,712</u>	<u>63.3</u>	<u>2,245,307</u>	<u>43.9</u>
Washington	182,017	3.2	3,971	0.9	106	*	177,940	3.5
Oregon	1,311	*	1,105	0.3	0	0.0	206	*
California	2,257,887	39.2	59,120	13.4	131,606	63.2	2,067,161	40.4
<u>ALASKA & HAWAII</u>	<u>2,296</u>	<u>*</u>	<u>2,177</u>	<u>0.5</u>	<u>109</u>	<u>*</u>	<u>10</u>	<u>*</u>
Alaska	1,856	*	1,789	0.4	67	*	0	0.0
Hawaii	440	*	388	0.1	42	*	10	*

TABLE VII
MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1965

Region and State	Type of Contractor							
	Total		Educational Institutions		Other Non-Profit Institutions a/		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>U. S. TOTAL</u>	<u>\$4,707,612</u>	<u>100.0%</u>	<u>\$369,907</u>	<u>100.0%</u>	<u>\$315,198</u>	<u>100.0%</u>	<u>\$4,022,507</u>	<u>100.0%</u>
<u>NEW ENGLAND</u>	<u>514,245</u>	<u>10.9</u>	<u>139,618</u>	<u>37.7</u>	<u>40,336</u>	<u>12.8</u>	<u>334,291</u>	<u>8.3</u>
Maine	3	*	-10	b/ -	0	0.0	13	*
New Hampshire	15,189	0.3	571	0.2	0	0.0	14,618	0.4
Vermont	3,239	0.1	123	*	0	0.0	3,116	*
Massachusetts	401,978	8.5	134,940	36.5	39,091	12.4	227,947	5.7
Rhode Island	10,044	0.2	3,080	0.8	19	*	6,945	0.2
Connecticut	83,792	1.8	914	0.2	1,226	0.4	81,652	2.0
<u>MIDDLE ATLANTIC</u>	<u>693,886</u>	<u>14.7</u>	<u>53,446</u>	<u>14.4</u>	<u>28,684</u>	<u>9.1</u>	<u>611,756</u>	<u>15.2</u>
New York	285,411	6.1	29,336	7.9	18,608	5.9	237,467	5.9
New Jersey	195,171	4.1	5,943	1.6	343	0.1	188,885	4.7
Pennsylvania	213,304	4.5	18,167	4.9	9,733	3.1	185,404	4.6
<u>EAST NORTH CENTRAL</u>	<u>358,069</u>	<u>7.6</u>	<u>41,434</u>	<u>11.2</u>	<u>20,883</u>	<u>6.6</u>	<u>295,752</u>	<u>7.4</u>
Ohio	131,562	2.8	6,524	1.8	9,534	3.0	115,504	2.9
Indiana	40,732	0.9	2,530	0.7	1,111	0.4	37,091	0.9
Illinois	57,146	1.2	14,017	3.8	9,935	3.2	33,194	0.8
Michigan	111,052	2.4	16,162	4.4	104	*	94,786	2.4
Wisconsin	17,577	0.4	2,201	0.6	199	0.1	15,177	0.4

NOTE: See Table VIII for footnotes.

TABLE VII (Continued)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
 TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1965

Region and State	Type of Contractor							
	Total		Educational Institutions		Other Non-Profit Institutions a/		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>WEST NORTH CENTRAL</u>	<u>109,625</u>	<u>2.3</u>	<u>5,083</u>	<u>1.4</u>	<u>8,830</u>	<u>2.8</u>	<u>95,712</u>	<u>2.4</u>
Minnesota	50,378	1.1	1,827	0.5	144	*	48,407	1.2
Iowa	2,722	0.1	1,115	0.3	0	0.0	1,607	*
Missouri	42,221	0.9	1,764	0.5	8,686	2.8	31,771	0.8
North Dakota	23	*	11	*	0	0.0	12	*
South Dakota	550	*	63	*	0	0.0	487	*
Nebraska	-50 b/	-	53	*	0	0.0	-103 b/	-
Kansas	13,781	0.3	250	0.1	0	0.0	13,531	0.3
<u>SOUTH ATLANTIC</u>	<u>\$ 674,671</u>	<u>14.3%</u>	<u>\$ 69,679</u>	<u>18.8%</u>	<u>\$ 35,895</u>	<u>11.4%</u>	<u>\$ 569,097</u>	<u>14.1%</u>
Delaware	4,274	0.1	259	0.1	0	0.0	4,015	*
Maryland	198,342	4.2	51,225	13.8	4,881	1.5	142,236	3.5
District of Columbia	40,825	0.9	10,051	2.7	15,535	4.9	15,239	0.4
Virginia	51,243	1.1	982	0.3	10,722	3.4	39,539	1.0
West Virginia	9,749	0.2	216	*	2,379	0.8	7,154	0.2
North Carolina	102,725	2.2	3,261	0.9	794	0.3	98,670	2.5
South Carolina	95	*	95	*	0	0.0	0	0.0
Georgia	16,565	0.4	610	0.2	1,565	0.5	14,390	0.4
Florida	250,853	5.3	2,980	0.8	19	*	247,854	6.2
<u>SOUTH CENTRAL</u>	<u>525,380</u>	<u>11.2</u>	<u>10,583</u>	<u>2.9</u>	<u>6,172</u>	<u>2.0</u>	<u>508,625</u>	<u>12.6</u>
Kentucky	1,008	*	306	0.1	0	0.0	702	*
Tennessee	49,074	1.0	840	0.2	0	0.0	48,234	1.2
Alabama	15,158	0.3	671	0.2	604	0.2	13,883	0.3
Mississippi	521	*	472	0.1	49	*	0	0.0
Arkansas	56	*	33	*	0	0.0	23	*
Louisiana	1,413	*	666	0.2	0	0.0	747	*
Oklahoma	12,237	0.3	1,267	0.3	236	0.1	10,734	0.3
Texas	445,913	9.5	6,328	1.7	5,283	1.7	434,302	10.8

TABLE VII (Continued)
MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1965

Region and State	Type of Contractor							
	Total		Educational Institutions		Other Non-Profit Institutions a/		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>MOUNTAIN</u>	<u>225,383</u>	<u>4.9</u>	<u>12,398</u>	<u>3.4</u>	<u>4,363</u>	<u>1.4</u>	<u>208,622</u>	<u>5.2</u>
Montana	1,740	*	221	*	0	0.0	1,519	*
Idaho	155	*	79	*	76	*	0	0.0
Wyoming	95	*	0	0.0	0	0.0	95	*
Colorado	149,255	3.2	5,366	1.5	1,037	0.3	142,852	3.6
Utah	16,965	0.4	2,129	0.6	0	0.0	14,836	0.4
Nevada	2,436	*	10	*	1,059	0.3	1,367	*
New Mexico	24,161	0.5	3,556	1.0	1,643	0.5	18,962	0.5
Arizona	30,576	0.7	1,037	0.3	548	0.2	28,991	0.7
<u>PACIFIC</u>	<u>\$1,602,808</u>	<u>34.0%</u>	<u>\$ 35,028</u>	<u>9.5%</u>	<u>\$169,632</u>	<u>53.8%</u>	<u>\$1,398,148</u>	<u>34.8%</u>
Washington	99,391	2.1	4,407	1.2	65	*	94,919	2.4
Oregon	1,376	*	1,325	0.4	0	0.0	51	*
California	1,502,041	31.9	29,296	7.9	169,567	53.8	1,303,178	32.4
<u>ALASKA & HAWAII</u>	<u>3,545</u>	<u>0.1</u>	<u>2,638</u>	<u>0.7</u>	<u>403</u>	<u>0.1</u>	<u>504</u>	<u>*</u>
Alaska	2,204	*	1,918	0.5	286	0.1	0	0.0
Hawaii	1,341	*	720	0.2	117	*	504	*

TABLE VIII

MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1966

Region and State	Type of Contractor							
	Total		Educational Institutions		Other Non-Profit Institutions a/		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>U. S. TOTAL</u>	<u>\$5,269,421</u>	<u>100.0%</u>	<u>\$322,690</u>	<u>100.0%</u>	<u>\$327,828</u>	<u>100.0%</u>	<u>\$4,618,903</u>	<u>100.0%</u>
<u>NEW ENGLAND</u>	<u>513,357</u>	<u>9.8</u>	<u>66,944</u>	<u>20.7</u>	<u>35,795</u>	<u>10.9</u>	<u>410,618</u>	<u>9.0</u>
Maine	99	*	11	*	0	0.0	88	*
New Hampshire	23,599	0.5	630	0.2	0	0.0	22,969	0.5
Vermont	5,673	0.1	47	*	0	0.0	5,626	0.1
Massachusetts	348,057	6.6	61,399	19.0	34,524	10.5	252,134	5.5
Rhode Island	15,658	0.3	3,791	1.2	0	0.0	11,867	0.3
Connecticut	120,271	2.3	1,066	0.3	1,271	0.4	117,934	2.6
<u>MIDDLE ATLANTIC</u>	<u>841,451</u>	<u>15.9</u>	<u>58,112</u>	<u>18.0</u>	<u>33,660</u>	<u>10.3</u>	<u>749,679</u>	<u>16.2</u>
New York	387,010	7.3	30,752	9.5	22,463	6.9	333,795	7.2
New Jersey	201,593	3.8	5,273	1.6	213	*	196,107	4.2
Pennsylvania	252,848	4.8	22,087	6.9	10,984	3.4	219,777	4.8
<u>EAST NORTH CENTRAL</u>	<u>472,470</u>	<u>9.0</u>	<u>47,554</u>	<u>14.8</u>	<u>22,914</u>	<u>7.0</u>	<u>402,002</u>	<u>8.7</u>
Ohio	234,691	4.5	6,639	2.1	11,069	3.4	216,983	4.7
Indiana	32,720	0.6	1,937	0.6	1,629	0.5	29,154	0.6
Illinois	64,984	1.2	18,614	5.8	10,010	3.1	36,360	0.8
Michigan	120,609	2.3	18,348	5.7	45	*	102,216	2.2
Wisconsin	19,466	0.4	2,016	0.6	161	*	17,289	0.4

MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1966

Region and State	Type of Contractor							
	Total		Educational Institutions		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>WEST NORTH CENTRAL</u>	<u>143,257</u>	<u>2.7</u>	<u>5,096</u>	<u>1.5</u>	<u>6,030</u>	<u>1.9</u>	<u>132,131</u>	<u>2.9</u>
Minnesota	76,022	1.4	2,061	0.6	519	0.2	73,442	1.6
Iowa	4,974	0.1	1,052	0.3	0	0.0	3,922	0.1
Missouri	56,631	1.1	1,623	0.5	5,493	1.7	49,515	1.1
North Dakota	71	*	37	*	0	0.0	34	*
South Dakota	172	*	21	*	0	0.0	151	*
Nebraska	96	*	78	*	18	*	0	0.0
Kansas	5,291	0.1	224	0.1	0	0.0	5,067	0.1
<u>SOUTH ATLANTIC</u>	<u>785,891</u>	<u>15.0</u>	<u>71,320</u>	<u>22.1</u>	<u>48,328</u>	<u>14.9</u>	<u>666,243</u>	<u>14.4</u>
Delaware	2,921	0.1	193	0.1	0	0.0	2,728	*
Maryland	245,691	4.7	52,607	16.3	5,514	1.7	187,570	4.1
District of Columbia	35,173	0.7	9,339	2.9	11,051	3.4	14,783	0.3
Virginia	64,260	1.2	1,169	0.4	22,540	6.9	40,551	0.9
West Virginia	9,040	0.2	45	*	6,126	1.9	2,869	*
North Carolina	54,552	1.0	3,833	1.2	1,519	0.5	49,200	1.1
South Carolina	453	*	101	*	0	0.0	352	*
Georgia	75,881	1.4	750	0.2	1,550	0.5	73,581	1.6
Florida	297,920	5.7	3,283	1.0	28	*	294,609	6.4
<u>SOUTH CENTRAL</u>	<u>477,067</u>	<u>9.1</u>	<u>2,059</u>	<u>2.9</u>	<u>7,098</u>	<u>2.1</u>	<u>460,910</u>	<u>10.0</u>
Kentucky	916	*	458	0.2	0	0.0	458	*
Tennessee	58,639	1.1	706	0.2	51	*	57,882	1.3
Alabama	35,274	0.7	603	0.2	889	0.3	33,782	0.7
Mississippi	423	*	283	0.1	45	*	95	*
Arkansas	334	*	62	*	0	0.0	272	*
Louisiana	1,443	*	803	0.3	0	0.0	640	*
Oklahoma	23,867	0.5	601	0.2	257	*	23,009	0.5
Texas	356,171	6.8	5,543	1.7	5,856	1.8	344,772	7.5

TABLE VIII (Continued)
 MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT,
 TEST AND EVALUATION WORK, BY REGION AND STATE AND BY TYPE OF CONTRACTOR

FISCAL YEAR 1966

Region and State	Type of Contractor							
	Total		Educational Institutions		Other Non-Profit Institutions ^{a/}		Business Firms	
	\$000	Percent	\$000	Percent	\$000	Percent	\$000	Percent
<u>MOUNTAIN</u>	<u>216,607</u>	<u>4.0</u>	<u>13,153</u>	<u>4.1</u>	<u>3,858</u>	<u>1.1</u>	<u>199,596</u>	<u>4.2</u>
Montana	1,331	*	72	*	0	0.0	1,259	*
Idaho	20	*	20	*	0	0.0	0	0.0
Wyoming	30	*	0	0.0	0	0.0	30	*
Colorado	133,990	2.5	6,476	2.0	735	0.2	126,779	2.7
Utah	15,471	0.3	1,773	0.6	0	0.0	13,698	0.3
Nevada	1,991	*	22	*	496	0.1	1,473	*
New Mexico	27,899	0.5	3,717	1.2	2,020	0.6	22,162	0.5
Arizona	35,875	0.7	1,073	0.3	607	0.2	34,195	0.7
<u>PACIFIC</u>	<u>1,809,517</u>	<u>34.3</u>	<u>47,317</u>	<u>14.6</u>	<u>169,994</u>	<u>51.8</u>	<u>1,592,206</u>	<u>34.5</u>
Washington	125,293	2.4	6,466	2.0	105	*	118,722	2.6
Oregon	1,349	*	1,111	0.3	0	0.0	238	*
California	1,682,875	31.9	39,740	12.3	169,889	51.8	1,473,246	31.9
<u>ALASKA & HAWAII</u>	<u>9,804</u>	<u>0.2</u>	<u>4,135</u>	<u>1.3</u>	<u>151</u>	<u>*</u>	<u>5,518</u>	<u>0.1</u>
Alaska	1,685	*	1,598	0.5	87	*	0	0.0
Hawaii	8,119	0.2	2,537	0.8	64	*	5,518	0.1

^{a/} Includes contracts with Other Government Agencies.

^{b/} The negative value results from contract cancellations in excess of new awards.

* Less than 0.05%.

GEOGRAPHIC REGIONS



Part V

POST-VIETNAM PLANNING

This section consists of excerpts from two Government documents dealing with economic adjustments to cutbacks in U. S. military spending.

EXCERPT FROM JANUARY 1967 ECONOMIC REPORT OF THE PRESIDENT

* * * * *

AFTER VIETNAM

Despite all our efforts for an honorable peace in Vietnam, the war continues. I cannot predict when it will end. Thus our plans must assume its long duration.

But peace will return—and it *could* return sooner than we dare expect.

When hostilities do end, we will be faced with a great opportunity, and a challenge how best to use that opportunity. The resources now being claimed by the war can be diverted to peaceful uses both at home and abroad, and can hasten the attainment of the great goals upon which we have set our sights.

If we keep our eyes firmly fixed on those goals—and if we plan wisely—we need have no fear that the bridge from war to peace will exact a wasteful toll of idle resources, human or material.

But when that welcome day of peace arrives, we will need quick adjustments in our economic policies. We must be prepared for those adjustments, ready to act rapidly—both to avoid interruption to our prosperity and to take full and immediate advantage of our opportunities.

Planning for peace has been an important activity in many executive agencies. But the effort needs to be stepped up and integrated.

Accordingly, I am instructing the heads of the relevant agencies in the executive branch, under the leadership of the Chairman of the Council of Economic Advisers, to begin at once a major and coordinated effort to review our readiness. I have asked them—

to consider possibilities and priorities for tax reduction;

to prepare, with the Federal Reserve Board, plans for quick adjustments of monetary and financial policies;

to determine which high priority programs can be quickly expanded;

to determine priorities for the longer range expansion of programs to meet the needs of the American people, both through new and existing programs;

to study and evaluate the future direction of Federal financial support to our States and local governments;

to examine ways in which the transition to peace can be smoothed for the workers, companies, and communities now engaged in supplying our defense needs, and the men released from our armed forces.

I have directed that initial reports be prepared on all of these and related problems, and that thereafter they be kept continuously up to date.

* * * * *

**EXCERPT FROM REPORT OF THE COMMITTEE ON THE
ECONOMICS OF DEFENSE AND DISARMAMENT, JULY
1965**

Chapter 5

INITIAL CONCLUSIONS ON GOVERNMENT POLICIES

During its review of existing Government programs—other than general fiscal and monetary policies—which assist in the economic adjustment to changes in defense and related activities, the Committee agreed on certain modest but useful improvements that it could recommend. Also, it agreed to reject, at least for the present, other changes suggested to it. And it agreed that certain suggested lines of approach deserve further study.

This chapter summarizes the Committee's conclusions under several headings: Federal Government organizations and procedures, aids to workers, aids to communities, aids to defense firms, and support of research and development. In practice, many of the activities discussed under each heading serve one or more of the other purposes.

The Committee also makes some general recommendations to States and communities and presents some conclusions regarding the future of its own work. Recommendations relating to the collection of further data and to research that is needed are included in chapter 6.

In conducting its study and formulating its conclusions, the Committee has been guided by several basic criteria:

1. Consistency with national economic policies—promotion of full employment and rapid economic growth;
2. Consistency with standards of fairness and equity among various sectors of the economy and regions of the country—avoidance of singling out particular groups for special benefits not available to others in similar circumstances;
3. Consistency with efficient allocation of the Nation's resources—avoiding the creation of longrun inefficiencies in the economy when dealing with short-term problems?
4. Consistency with local and private initiative—encouraging and assisting rather than replacing the efforts of those State and local governments and private organizations which are attempting to offset adverse economic consequences of shifts in defense spending;
5. Consistency with the national security—maintaining the capability of the Nation to respond effectively to changes in the requirements of national security programs, whether total defense spending is increased or reduced as a result of arms control and disarmament agreements or other causes.

FEDERAL GOVERNMENT ORGANIZATIONS AND PROCEDURES

ORGANIZATIONS

The Committee was impressed by the variety of services which now exist within the agencies of the Federal Government to assist workers and communities affected by the closing or cutback of defense installations or by reduction or termination of defense procurement. The effectiveness of such assistance, however, depends on prompt and thorough diagnosis of the problems of the affected workers and communities, and a determination of which Federal programs would be useful. Thorough coordination of the efforts of the Federal agencies among themselves and with State and local authorities is essential to a sound program of adjustment.

The principal need is to make known and available to the local community the wide range of services which Federal agencies can provide, and to bring about the development of an overall program for the use of these services. For every affected community, there needs to be some coordinating agency to serve as the single point of contact between the Federal Government and the appropriate State and local leaders. The purposes of this contact are to assist the community in diagnosing its needs and to make arrangements with the various Federal agencies to supply the appropriate services. Following the initiation of Federal services, the coordinating agency can continue to expedite and coordinate the application of these services.

The Committee recommends that the Office of Economic Adjustment in the Department of Defense (DOD), the Office of Economic Impact and Conversion in the Atomic Energy Commission (AEC) and the National Aeronautics and Space Administration (NASA) continue to exercise the primary responsibility for coordinating Federal activities in those communities affected by the closing or cutback of Government installations.

Currently, the same agencies and the same personnel staff both the President's Task Force on Community Assistance and the Advisory Committee to the Secretary of Defense. *We recommend that functions relating to community assistance be carried out by a group with a single title—the Federal Task Force on Community Assistance.* (As noted in ch. 4, the President's Task Force on Community Assistance, whose functions the Federal Task Force would inherit, was created during the period in which this report was in preparation, and it reflected, in part, considerations which grew out of the work on this report, especially that of the working group on community adjustment problems. The Advisory Committee to the Secretary of Defense had been created earlier.)

The following departments and agencies should be represented on the Federal Task Force: Department of Defense; Atomic Energy Commission; National Aeronautics and Space Administration; Department of Labor; Department of Commerce; Office of Economic Opportunity; Department of Agriculture; Department of Health, Education, and Welfare; Department of Interior; General Services Administration; Housing and Home Finance Agency; Small Business Administration; Veterans' Administration; and the Arms Control and Disarmament Agency as an observer. Other agencies might be added from time to time as needed.

The basic staff of the task force should be provided by the Departments of Labor and Commerce, augmented as required from other Departments and from agencies. In certain instances, the Federal Task Force may find it useful to create smaller working groups to assure effective on-the-spot coordination of the activities of the cooperating agencies.

In cases where DOD, AEC, or NASA are directly involved, the advice of the task force and the services of its member agencies should be made available when requested by the department or closing or cutback of whose installation, or the cutback or cancellation of whose contract, is the source of the potential difficulty.

The Federal Task Force on Community Assistance should be permanently constituted and given an executive director and deputy director. It is recommended that it proceed rapidly to develop procedures and to carry out vigorously its mandate. In addition to its coordinating functions, it should encourage the training of community assistance specialists.

In all cases, however, coordinating agencies should operate by bringing to bear upon community problems the services of existing agencies of the Federal Government. *The coordinating agencies should not themselves develop specialized staffs to provide technical services. This is now and should remain the responsibility of the various departments.*

ADVANCE NOTICE

The Committee recommends that the defense procurement agencies review intensively their existing policies, procedures, and practices regarding the provision of advance notice to contractors and communities of impending changes in their programs. It believes that the maximum feasible advance notice of cancellations and cutbacks of contracts should continue to be given to the contractors and the localities involved, so that local officials can initiate or intensify adjustment planning and enlist the assistance of Federal agencies at the earliest practicable date.

In addition, the Committee recommends that, when a major contract is terminated, procurement agencies require the prime contractor to supply an assessment of the impact of this termination on its own directly related employment. The contractor should also furnish a list of subcontractors, together with information that would make it possible to estimate the timing and nature of the impact on them of the termination of the prime contract. The U.S. Employment Service, in cooperation with local employment services, should then develop an initial assessment of the impact on employment and on local labor markets, and make this assessment available to the State and Federal agencies primarily responsible for adjustment assistance.

AIDS TO WORKER

JOB INFORMATION AND PLACEMENT SERVICES

The Committee believes that it is necessary to strengthen the Federal-State Employment Service, through larger budgets and more effective procedures. It therefore strongly supports the expanded funding requested in the President's budget for fiscal year 1966. The effectiveness of all means—including both public and private employ-

ment services—that dislocated employees use to find employment should be enhanced. *In particular, the Committee recommends that the effectiveness of the Federal-State Employment Service in aiding professional and technical workers be strengthened.*

The Committee further recommends that the Department of Labor establish at the national level several advisory teams of specialists in interviewing, testing, counseling, guiding, and training. These teams could be quickly sent, at the request of the appropriate coordinating agencies, to areas seriously affected by shifts in defense spending. Also, the Department should encourage the State employment services to develop similar teams of specialists.

The effective matching of men and jobs requires that good labor market information be obtained quickly. Expanded information on job vacancies is extremely important both for this and for other reasons. *The Committee recommends, therefore, that the Department of Labor continue to explore effective means of developing and disseminating information on job vacancies, and of exchanging such information among areas and States throughout the Nation.*

To permit more rapid matching of job requirements with worker qualifications, *it is recommended that, as soon as effective procedures are developed, the Labor Department's LINCOS system be expanded rapidly to facilitate interarea recruitment.* This would have benefits for employees affected by all layoffs, whether defense-related or arising from other causes.

TRAINING AND RETRAINING

The training and retraining programs conducted by the Federal Government to help unemployed workers have been described in chapter 4. The Committee welcomes the 1965 amendments that strengthen further the programs under the Manpower Development and Training Act (MDTA).

The Committee believes that active and effective programs of training and retraining can make a vital contribution to assisting new workers to find jobs and to speed the reemployment of many workers who lose their jobs as the result of all kinds of economic change. However, the Committee does not believe that the special nature or extent of existing or prospective displacement of defense workers *by itself* justifies any enlargement of *general* training and retraining programs that is not justified on other grounds.

Questions have been raised whether existing programs provide adequately for the special needs and circumstances of defense workers, and particularly for the needs of displaced engineers and other technical and professional workers. Limited programs—at least for technicians—may now be possible under the MDTA amendments of 1965.¹

The current experimental program for the retraining of displaced defense workers on Long Island will be carefully evaluated by the Committee. It is hoped that this experiment will lead the way to similar programs in other areas affected by defense shifts. The Committee also expects to evaluate proposals for other special retraining programs for displaced defense workers—for example, the proposal for programs to train defense scientists and technicians as teachers of science in secondary schools and colleges.

¹ See ch. 4, pp. 34-35.

The Committee commends the present administrative procedures used to make surplus Government property promptly available for use in connection with the training of displaced workers. It hopes that these procedures can be further developed, including more effective ways for making training authorities aware of the availability of suitable properties.

RELOCATION

As noted in chapter 4, the disposal of residences may be a serious barrier to labor mobility. Hence *the Committee recommends that the Veterans' Administration (VA) and the Housing and Home Finance Agency (HHFA) utilize more actively their authority to initiate mortgage forbearance agreements in the case of emergencies created by changes in defense programs. It recommends further study of the problem of disposal of residences of workers displaced by major defense cutbacks.* A working group, including representatives of VA, HHFA, GSA (General Services Administration), and the Departments of Commerce and Labor should be established to consider additional possible programs in this area.

The Committee gave consideration to the possible use of relocation allowances to assist displaced defense workers to move to areas in which jobs are available. Specifically, it considered the suggestion that the precedent—in the Trade Expansion Act—of providing relocation assistance to those affected by changes in Federal programs or policies be adapted to employees affected by defense shifts. The Committee noted the lack of any experience under the act. More importantly, it recognized the difficult administrative and equity considerations that could arise in attempting to restrict such assistance to defense workers or to communities affected by shifts in defense procurement. For example, when a firm that produces for both defense and nondefense purposes lays off an accountant, it is often almost impossible to determine whether he was laid off as the result of a cutback in defense work. Nor is there any basis for treating differently the production worker on the nondefense side of a contractor's business who is "bumped" by a worker from the defense side when defense work is curtailed. It is difficult to conclude that the retail salesman who is laid off in a community where retail sales have been reduced because of decreases in defense production is less deserving of relocation assistance than the worker in the defense plant.

Difficulties such as these make it most doubtful that relocation assistance would be justified except as part of a general program available to all—whether the need arises from defense shifts or from other causes.

The Committee recommends that the Department of Labor continue to study the possibility of a general program of relocation assistance to unemployed workers, drawing upon the experience of its experimental program under the MDTA, especially as expanded in accordance with the 1965 MDTA amendments. It should also study the experience of other countries with relocation allowances. However, the Committee concluded that existing or prospective problems of dislocation arising from defense shifts do not by themselves justify any general relocation program that is not justified by the needs of the economy generally.

AIDS TO COMMUNITIES

The Area Redevelopment Act of 1961 provided many new tools for communities to use in overcoming economic adversity, including planning assistance, and grants and loans for public facilities, commercial and industrial enterprises, and training programs. The Committee heartily endorses the proposals which the President has sent to the Congress for broadening the scope and improving the effectiveness of this program. The strengthened program will help communities to cope with economic difficulties of whatever origin; in addition, it will be of particular assistance to communities affected by shifts in defense procurement.

INDUSTRIAL FACILITIES

The timely disposal of Government-owned industrial facilities which are no longer in use and have become surplus is often essential to the economic health of a community. Delay in disposal may mean that a portion of the community's work force scatters, thus making it even more difficult to attract new firms to the area. *The Committee recommends that the GSA continue to consider community needs of the highest priority in the disposal of surplus facilities, and that it especially consider ways to improve coordination of the disposition of personal and real property in existing installations.*

The sale of the naval ordnance plant in York, Pa., as a going concern without interruption in production and without adverse impact on local employment is an example of what can be accomplished when facilities are disposed of quickly to an appropriate buyer. It is representative of constructive approaches that should be encouraged.

SPECIAL ASSISTANCE TO DEFENSE-DEPENDENT COMMUNITIES

The Committee has considered whether additional specialized Federal assistance—beyond that provided in the general area and regional development program—could be given to communities suffering severe dislocation as a result of the closing of defense installations or the termination of contracts. For example, it has been suggested that, where measures to improve the mobility of labor and industry do not suffice, communities heavily affected by defense shifts should be eligible for low-interest loans, grants, and other assistance beyond that available to other areas where unemployment is high or average incomes are low. Also, it has been suggested that defense-affected areas (whether or not they qualify as labor-surplus areas) should be given special preference in Government contracts—perhaps through procurement set-asides—or that prime contractors should be required to place a portion of their subcontracts in such areas, when feasible.

The Committee has, so far, been unable to find reasonable criteria by which to define an area whose economic problems can specifically be pinned to shifts in defense programs and to distinguish its needs from those of other areas suffering economic adversity. For example, there is no doubt that the economy of Long Island has been adversely affected by the termination or reduction of defense production in a number of plants. Yet, on the basis of unemployment rates or income

levels, the community is far better off than thousands of other communities where defense shifts have played a considerably smaller role—or no role at all—in creating economic hardship.

Nevertheless, the Committee recognizes that there are and will be some communities—particularly small and isolated ones—whose economic fortunes are very heavily tied to continued defense activities and whose very existence can be threatened by its termination. If an action of the Federal Government withdraws their major economic support, the residents of such communities have a strong case for special Federal assistance—a stronger case perhaps than that of other communities which may suffer equally from the exhaustion of a mineral resource, the diversion of trade, or the business failure of their principal private employer. The Committee will continue to study possible criteria for distinguishing the case of such communities.

However, the difficulties extend far beyond those of identifying a special dependence on defense work. The criteria of efficiency suggested at the beginning of this chapter preclude solutions which permanently and artificially sustain an existing economic pattern in a community. In particular, the Committee does not accept any solution based either on the continuance of unneeded defense activities or on providing, on more than a temporary basis, a special procurement advantage not justified by costs and efficiency.

The Committee intends to study further the problem of providing special assistance to those few communities which may be so heavily dependent on defense activity that its termination in those areas threatens their continued existence.

AIDS TO DEFENSE FIRMS

The Committee welcomes the recent actions of the Department of Defense and NASA which clearly state that companies may charge to their defense or space contracts an allocable share of the costs of generalized long-range management planning. We understand that AEC already views such costs as allowable.

Numerous additional suggestions have been made for the Government to assist and encourage defense contractors to diversify into nondefense markets. One suggestion is to allow defense contractors to charge as overhead costs on their Government contracts some portion of the initial efforts required to begin a commercial diversification program, such as the development of generalized marketing capability and exploratory planning for commercial products. The Committee intends to review the application of the 1964 amendment to procurement regulations and, in the course of that review, the merits of the above suggestion should be considered. The Committee has rejected as completely inappropriate, as well as ineffective, the alternative suggestion that larger profit margins be allowed on defense contracts in order to provide increased corporate funds for investment in diversification efforts.

There appear frequently to be cases in which, as a result of a decline in defense work, a company using a Government-owned defense manufacturing or development facility finds that it has a large amount of unutilized or underutilized capacity, even though the remaining volume of defense work requires the continued operation

of the plant. Under such circumstances, it would appear to be desirable public policy to encourage the company operating the Government-owned facility to develop alternative work for the unutilized portions. This could be done, for example, through the use of rental charges for commercial activity. *The Committee recommends that Federal procurement agencies review their policies governing the use for commercial work of Government-owned contractor-leased facilities.* Such policies should not, of course, permit the use of Government-owned facilities to the detriment of Government work being processed, nor should they confer an unfair competitive advantage upon the user. Within these limitations, however, the Committee believes that more effective procedures can be developed.

It has been suggested frequently that the Government has a moral obligation to award large *nondefense* research and development (R. & D.) contracts to specialized defense contractors whose business has been seriously curtailed, merely to keep their facilities and staffs together and at work. Many who advocate this course are confident that the benefits of such research would inevitably be substantial and well worth the cost.

Although the Committee recognizes that national security requires the maintenance of an adequate private research and development capability to meet emergency needs, it rejects the idea that the Government should support particular defense contractors, merely in order to maintain their scale of operations and to hold their staffs together. However, if there are large-scale nondefense research and development projects that can be justified on their own merits—and undoubtedly there are expanding opportunities of this kind—many defense contractors should be and will be able to compete effectively for such contracts.

SUPPORT OF RESEARCH AND DEVELOPMENT

Pending completion of its evaluation of more far-reaching proposals to facilitate the application of defense technology to civilian needs, the Committee supports certain other programs to strengthen R. & D. in nondefense fields. An effect of these programs will be to strengthen civilian demand for R. & D. personnel, thereby helping to assure an adequate demand for the services of scientific and technical personnel at a time when the demand for them by defense industry may have leveled off.

One of these programs is proposed in the State Technical Service Act now before the Congress. This program would provide matching Federal-State grants for regional technological information centers designed to help firms apply advanced technology to the extension of markets and to stimulate the creation of new technically based businesses. State plans would be formulated and put into effect with local initiative and responsibility.

In addition, the Institute for Applied Technology in the National Bureau of Standards is seeking to extend its programs aimed at creating an environment more conducive to technical innovation in industry. These programs include:

Operation of the Clearinghouse for Federal Scientific and Technical Information, whose function is to convey unclassified

Government-generated physical science and engineering information to industry;

Development of criteria of performance for industrial products so as to lead to the development of performance-based codes and standards, and thus aid technical innovation;

Development of criteria of performance for Federal purchases of systems (such as hospitals, transportation, waste disposal), so as to encourage the use of these purchases to stimulate technical innovation.

It should be noted that both NASA and AEC have active information dissemination programs through which the research and the development from these agencies' programs are made available to the public for industrial application. Unclassified scientific and technical information from the Defense Department is made public through the clearinghouse, as stated above.

To the extent that capabilities for basic research are released from defense-oriented activities, it should be possible for Federal agencies that perform or fund basic research to increase their activity on advantageous terms. Enlarged support through the National Science Foundation would appear to be one effective tool in this area. *The President has recommended enlarged support for basic scientific research, and the Committee strongly supports this recommendation.*

FURTHER ASSISTANCE TO INDUSTRIAL RESEARCH AND DEVELOPMENT

Many proposals have been made for the Federal Government to increase the incentive of private companies to conduct R. & D. projects. These proposals are aimed both at expanding the market for nondefense R. & D. work which might be performed by specialized defense contractors and at creating new R. & D. jobs elsewhere in the economy. The suggestions include (1) permitting firms to charge off as a current expense for tax purposes the purchase of new equipment for R. & D. work (a proposal included in the administration's 1963 tax bill); (2) a partial tax credit for all R. & D. costs; (3) an aid program analogous to the mining exploration program of the Department of the Interior, under which the Government would pay part of the cost of civilian R. & D. work, but would be reimbursed out of the proceeds if the R. & D. should lead to profitable production; (4) loans or loan guarantees for R. & D. costs; (5) sale or lease of Government-owned plant and equipment on attractive terms for commercial R. & D. work; and (6) direct technical assistance to companies not familiar with the uses of R. & D. work.

The Committee intends to study intensively these and similar proposals for special incentives for private research and development.

PROPOSALS FOR EXPANDED GOVERNMENT R. & D. ON NATIONAL PROBLEMS

The considerable efforts of the past decades to develop means of understanding and dealing with complex technical problems have led to modern systems engineering. Many who are seeking solutions to nondefense problems have seen possible applications in their field of interest of systems engineering skills now largely centered in the

defense industry. It has frequently been urged that the Government undertake large new research programs in such fields as urban transportation, pollution control, oceanography, weather forecasting, methods for organizing medical and hospital care, and techniques of education. Defense contractors, as well as others, would be eligible to bid for the research contracts; and those who have suggested the undertakings are confident that existing defense contractors would secure many of the contracts for the research work.

There appears to have been some expectation that the Committee might recommend the appropriation of funds for competitions in certain specific fields of research. The Committee is in no position to make any such recommendation. It has received much exhortation but no hard information which would indicate the probability of high payoffs from such new research. However, the Committee clearly is not the appropriate organization to review specific proposals of this sort, since it lacks facilities for receiving and evaluating large bodies of technical, budgetary, and similar specialized information. But the Committee does intend to study whether the Federal Government—outside the areas of defense, space, and atomic energy—is adequately staffed and appropriately organized to evaluate complex proposals for large-scale research and development relating to civilian needs. It will be particularly interested in reviewing the plans for (and, later, the experience of) the new unit for program evaluation in the Bureau of the Budget.

PROPOSALS FOR EXPANDED UTILIZATION OF ADVANCED TECHNOLOGY IN EXISTING GOVERNMENT OPERATIONS

The Committee intends also to explore the suggestion that it recommend to the administrators of existing Government nondefense programs that the procedures and specifications of existing programs of procurement should be revised, to permit more effective application of advanced technology and systems engineering. The reasoning is that, by specifying overall performance rather than details of construction or design, Government purchases of such items as housing for military dependents, hospitals, or educational facilities can be made at substantially lower costs in terms of program effectiveness. It is assumed that defense contractors would be interested in, and successful in, bidding on such a basis. Similar revised procedures might be applied to the procurement of services, including the possible substitution of purchased services for those performed "in house."

The Committee has evidence which suggests that this approach is beginning to be used in some areas of Federal procurement, and hopes to review that experience.

ADVANCE PROGRAM PREPARATION BY STATES AND COMMUNITIES

The Committee believes that there has now been sufficient experience with the termination of major contracts and the closing or cut-back of military installations so that States and communities which are potentially vulnerable to such events should, if they have not already done so, begin actively to study the extent and nature of their dependence on defense production, and begin to develop programs which could be implemented if the need should arise. It is

neither desirable nor necessary that the preparation of conversion or adjustment programs be postponed until there has been a decision to close a base or to cancel particular contracts. Many communities, and many private groups within such communities, have, of course, already begun to consider such programs.

Diversification of the local economic base is one of the most effective ways of offsetting the possibly adverse economic results which can follow the curtailment of a defense-related activity in a community. Often, defense facilities can be adapted to new uses; other circumstances may favor the development of local business opportunities unrelated to the defense facility.

Roswell, N. Mex., is an example of a community where leaders, recognizing their heavy dependence on payrolls from a nearby Air Force base, took the initiative in reducing this dependence.

Community leaders approached the Office of Economic Adjustment of the Department of Defense in early 1963 requesting assistance in planning to cope effectively with any possible major reduction in employment at the base, even though this was not anticipated for many years. Other Federal agencies assisted in plans for community development. The city of Roswell employed consultants to analyze its business and industrial potential, and has now drawn up a land-use and development plan. These projects are expected to bring Roswell a more diversified economy—one which will enable it to adjust more easily to any necessary future changes in defense programs.

Diversification may not always be possible, because of the special nature of the defense activity or the unique characteristics of the community. Also, in some situation, it may be unable fully to offset the effects of a defense curtailment. Nevertheless, the provision of reemployment opportunities in place offers such obvious advantages in minimizing personal disruptions—as well as holding down the adverse consequences for retail trade, for real estate and mortgage markets, and for public and private institutions—that its possibilities should be fully explored. Particular attention should be given to identifying the types of resources presently employed on defense work, including subcontracting, and to determining the economically sound alternative uses for these resources.

The various departments and agencies of the Federal Government which administer the programs described in this and the preceding chapters stand ready to be of assistance in advance community planning. The Committee is encouraging the appropriate Federal agencies to prepare and make available detailed case studies of successful diversification efforts, and information manuals concerning the analytical and program resources that can be brought to bear by communities in their planning efforts.

The Committee thus recommends that communities heavily dependent upon a defense establishment begin as soon as possible to explore fully the feasibility of economic diversification programs to minimize vulnerability to defense program changes, and to provide maximum reemployment opportunities locally.

To assist in such exploration by communities, the Committee recommends that procurement regulations should include as an allowable expense not only diversification planning by defense contractors (as at present) but also the expenses of the contractor's participation in community diversification planning.

THE FUTURE OF THE COMMITTEE

The Committee believes that its work should be continued. There is need for a continuing review and coordination of the work of the Federal agencies relating to the economic impact of defense and to the problems of conversion or adjustment which arise from shifts or reductions in defense activity. It feels that a Committee of senior officials from the agencies actively responsible for defense-related activities, for studies of the economic effects of those activities, and for programs that can assist in conversion or adjustment is, for the present, an effective and necessary device.

Such a Committee needs to have a full-time staff to expedite and give continuity to its work. But it needs no authority to make contracts or grants for studies relevant to its work. Those studies can be made by the agencies represented on the Committee, or these agencies can make and supervise contracts or grants for this purpose. The Committee's responsibility should extend only to the suggestion, coordination, and review of such studies.

The Committee, or the agencies represented on it, can supply a needed link with the staffs of congressional committees, State and local government bodies, and universities and other public and private organizations in the area of research on the economic impact of defense and disarmament. It can also stimulate additional agencies or groups, within and outside the Government, to devote more effort to research on the economic impact of defense programs.

LINES OF EMPHASIS IN FUTURE WORK

The Committee has considered the general nature of a program, and it believes that there are five areas that should be emphasized.

First, there is vital need for more adequate, comprehensive, and accurate *information and analysis* of the impact of defense programs on the U.S. economy. The final chapter of this report outlines what we know, what we need to know, and the efforts now being made to learn more. The continuing development of such information should be a principal concern of the Committee.

Second, the experience under existing and new programs to aid in defense adjustment will need continuing *review and evaluation*. This evaluation is, of course, a primary responsibility of the operating agencies. But the Committee can serve a useful function by encouraging the agencies to make these evaluations, by reviewing them from time to time itself, and by calling to the attention of principal officials the need to correct any deficiencies that may be disclosed.

Third, there is need for continued improvement in the *coordination* of Federal programs relating to the economic impact of defense, and of Federal programs with those of State and local governments. This should continue to be a principal concern of the Committee.

Fourth, the Committee wishes to encourage a continuing *study and analysis of the opportunities*, as well as the problems, created by shifting defense programs. Although the Nation will continue to require large resources for defense, the accomplishments of the intensive defense production effort of recent years and the possibility of reduced international tensions in the years ahead may provide important opportunities to use a growing share of our output for other

purposes. The Committee has been only one of a number of public and private groups which has the responsibility for assessing these opportunities. But it has had a particular interest in—and perhaps some special competence to consider—certain special aspects of this broad field.

Fifth, the Committee should continue to receive and assess a wide range of additional proposals for new *programs* to alleviate the impact of defense changes. A number of these proposals, already received but not yet adequately evaluated, have been referred to in the earlier part of this chapter. Other proposals should be sought by the Committee.

