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INVENTORY FLUCTUATIONS AND ECONOMIC STABILIZATION

HEARINGS

BEFORE THE

SUBCOMMITTEE ON ECONOMIC STABILIZATION, AUTOMATION, AND ENERGY RESOURCES

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INVENTORY FLUCTUATIONS AND ECONOMIC STABILIZATION

MONDAY, JULY 9, 1962

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON ECONOMIC STABILIZATION,
AUTOMATION AND ENERGY RESOURCES
OF THE JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee of the joint committee met, pursuant to notice, at 10 a.m., in room 4200, New Senate Office Building, Hon. Wright Patman presiding.

Present: Representative Patman; Senators Proxmire and Pell; and Representative Widnall.

Also present: William Summers Johnson, executive director; Paul Darling, economist; and H. D. Gewehr, research assistant.

Chairman PATMAN. The committee will please come to order.

The hearings this morning and for the remainder of the week are on the role of business inventories in general economic fluctuations. We are interested particularly in what role inventory changes may play in magnifying economic recessions and booms and perhaps in influencing the turning points in business cycles.

Representative Reuss, who is acting chairman of this subcommittee for the purpose of this study on inventories, is unavoidably detained this monrning. He hopes to be here later in the morning.

In any case, he will chair the hearings during the remainder of the week.

Over the past year a number of experts from Government, the colleges, and private research organizations have prepared technical papers for the committee on various aspects of the inventory question.

We have had many favorable comments on these papers and the committee is very grateful for the important public service the authors have done. In addition, a number of business executives and economists have volunteered their time to serve on a task force at Mr. Reuss' request to make summary reports on what is now known about inventory behavior, its causes and effects. The committee is also most grateful to these people.

This morning we have a panel of very distinguished witnesses: Prof. James S. Duesenberry of Harvard University, Mr. Vincent J. Graham, general merchandising controller, Sears Roebuck & Co., Dr. Thomas M. Stanback, Jr., National Bureau of Economic Research; and Mrs. Ruth P. Mack, National Bureau of Economic Research.

We will begin with a statement from Professor Duesenberry, who has served as chairman of the task force. After that, we will hear statements and comments from the other panelists.

Professor Duesenberry, proceed in your own way, sir.

STATEMENT OF JAMES S. DUESENBERRY, PROFESSOR OF ECONOMICS, HARVARD UNIVERSITY

Mr. DUESENBERRY. I have a prepared statement which I will read, except for a few bits.

Inventory investment is one of the most volatile elements in our economy. During business cycles, changes in the rate of inventory investment have been larger in magnitude than those in any one of the other volatile elements in our economy: plant and equipment expenditure, housing, and durable consumption.

There is no question then, that fluctuations in inventory investment have made a major contribution to the instability of our economy. The initial impact of fluctuations in the rate of inventory investment is reinforced by the impact of those variations on corporate profits and from corporate profits to plant and equipment investment. It is certainly true that if fluctuations in the rate of inventory investment could be reduced in magnitude the violence of our business cycles would be substantially reduced.

Any effort to reduce fluctuations in the rate of inventory investment must be predicated upon an understanding of the causes of those fluctuations.

Unfortunately, we do not have a complete understanding of the causes which we do understand do not appear to be amenable to control. To a considerable extent variations in inventory investment are a direct reflection of variations in orders for defense goods and producers' durables with long production periods. When orders for these goods are reduced deliveries continue for a considerable time after the rate of production has been reduced.

Government expenditures and expenditures for producers' durables are recorded in the national income accounts at the time of delivery.

During the period when work in process and purchased materials are being worked off in response to a decline in orders, the national income accounts show small declines in expenditures by Government or for plant and equipment, but large decline in inventory investment must be attributed directly to the decline in orders for defense goods or producers' durables.

That consideration was particularly important in 1954 when the rate of orders for defense goods was sharply reduced after the end of the Korean war. And it was also important in 1957–58 when efforts to control the rate of defense expenditures resulted in a cutback in orders for defense goods during 1957. In the latter case orders for defense goods were reduced in 1957 and increased during 1958. There was relatively little variation in the rate of Government expenditure during that period because the swing in orders took place so quickly that it had very little effect on actual deliveries.

It seems fairly clear that the only way to control fluctuations in inventories of the type just mentioned is to control fluctuations in the rate at which orders for producers' durables and defense goods are placed. Any policy which could reduce fluctuations in orders for producers' durables would have a direct effect on fluctuations in inventories.

In the case of defense goods it seems clear that the Defense Department ought to take some cognizance of the impact of its orders policy on the economy generally. Insofar as the placement of de-

fense orders is varied for budgetary reasons, the actions of the Defense Department ought to be coordinated with the general budgetary policy of the Federal Government.

But insofar as variations in defense orders take place because of changes in the international situation or changes in the basic programs of the Defense Department, we cannot expect that the Defense Department will change its policy in order to stabilize the economy.

Any effort to stabilize the rate of orders for producers' durables would have to be part of a general program to stabilize the rate of investment. Discussion of such a program is beyond the scope of this hearing.

Aside from the variations resulting from variations in Government and producers' durable orders the rate of inventory investment appears to be related to the rate of growth of output of goods in the economy as a whole.

As a result, the rate of inventory investment tends to be high in the early upswing of the business cycle and lower toward the end of the expansion period when the rate of growth of the economy has slowed down.

On this account the rate of inventory investment tends to become negative during periods of decline in demand for final product.

I should say during periods of decline in the rate of growth of demand for final product.

Although there is a general tendency for the rate of inventory investment to vary in proportion to the rate of growth of demand for goods, the relation between the rate of inventory investment and the rate of growth of demand is only a loose one.

Nonetheless it is clear that anything which would stabilize the rate of growth of final demand would also tend to stabilize the rate of inventory investment. There is some reason to believe that in the late phases of a business cycle expansion, producers accumulate inventories passively. That is they maintain rates of production at times when sales are not rising as fast as they had anticipated. They may continue to produce at rates in excess of the rate of sale for some months. When there is a clear signal that no further rise in sales can be expected producers may then cut back production sharply in order to adjust inventory to their new sales expectation.

I believe that this factor was of considerable importance in the 1957–58 recession. Once again there does not seem to be any action directly related to inventories which would help to stabilize the economy against the kind of development just mentioned. It is generally believed that firms tend to accumulate extra inventories when they believe that delivery periods will increase and tend to reduce inventories when they believe the delivery periods will shorten.

There is, therefore, a tendency for the rate of inventory accumulation to rise as the rate of capacity utilization rises and to fall when capacity utilization falls. That, of course, accentuates the tendency for the rate of inventory investment to rise and fall with the rate of growth of output. Finally, of course, steel strikes and the anticipation of steel strikes have caused some major fluctuations in inventories in recent years.

To summarize, there is no doubt the fluctuations in the rate of inventory investment have made major contributions to the instability of our economy. The magnitude of postwar recessions would

have been substantially reduced had there been no inventory fluctuations. Indeed the postwar recessions would have been almost invisible in the absence of inventory fluctuations. The shift from negative to positive inventory investment in the early upswing is a major factor in the high rates of growth achieved during early upswings.

The nature of the causes of fluctuations in inventory investment is such that policy actions aimed at reducing those fluctuations directly are unlikely to be successful. Some people believe that monetary policy can be used to stabilize inventory investment. However, there is very little evidence that changes in monetary conditions have a marked direct effect on inventory investment.

The rate of inventory investment might be somewhat retarded during the early upswing by an early tightening of monetary policy but such a policy may not always be desirable from other standpoints. It seems to me very doubtful whether changes in monetary policy could retard the tendency for inventory investment to turn negative when the economy generally turns down. It seems to me that inventory investment will be stabilized by actions directed at stabilizing the demand for final product rather than by actions aimed at stabilizing inventories without stabilizing the demand for final product.

Chairman PATMAN. Thank you, sir.

Mr. Vincent J. Graham, general merchandise controller, Sears, Roebuck.

We will be happy to hear from you, sir.

STATEMENT OF VINCENT J. GRAHAM, GENERAL MERCHANDISE CONTROLLER, SEARS, ROEBUCK & CO.

Mr. GRAHAM. Thank you, sir. I have a prepared statement I would like to read.

My name is Vincent J. Graham. I am general merchandise controller at Sears.

Sears is engaged in the retailing trade in the general merchandise field.

The inventories which are dealt with at the retail level are a part of the total under discussion here, but consist only of finished goods inventories as compared to manufacturers' inventories which are made up of purchased raw materials, goods in process and finished goods.

The problems of manufacturers and retailers vary to the extent that I though it worthwhile to comment on some of the differences.

MANUFACTURERS

In the aggregate manufacturers use large quantities of basic raw materials with standard specifications that are not apt to differ materially between producers.

Obsolescence of raw material used in manufacturing is not a prime problem and a change in the rate of consumption means that materials will be used a little faster or last a little longer than anticipated.

Basic raw materials can often be diverted from one end product to another minimizing the effect on inventories of the shift of consumer demand from one product class to another.

Many manufacturers rely upon the depletion or buildup in the backlog of unfilled orders to determine their inventory needs. Inventories of raw materials and component parts required can be planned with considerable accuracy when measured against the backlog of unfilled orders where the manufacturer produces "to order."

RETAILERS

The retailers' inventories consist of specific items of finished goods of given size, style, color, and model. The design and utility of the specific products will differ greatly.

The items in finished state cannot be changed or diverted to some other use and may become obsolete or unsalable due to changes in styling or technological advances.

The retailer, in almost every instance, must be prepared to deliver goods to his customer from stock on hand as the demand materializes. This stock will consist of many thousands of individual items with varying quantities of each.

Due to lack of advance demand indication such as the manufacturer experiences in the backlog of unfilled orders, the inability to divert finished product to meet shifting customer demand, and the possibility of loss due to obsolescence, the retailer is forced to maintain his inventories based on his best estimate of demand. Most retailers, therefore, operate on a turnover basis, maintaining a flow of goods insight related to a predetermined number of weeks or months of anticipated future sales. The coverage will vary by merchandise categories as well as between companies dealing in the same general lines of goods.

The principal objective of the retailer is to take care of his customer's requirements. The retailers' inventories will, therefore, fluctuate as do sales. It is much more sensitive to demand being at the point of actual sale than are manufacturing inventories which are furthest removed. The degree to which the retailer correctly judges customer demand by item and maintains an adequate flow of inventory to fill the demand, as it materializes, will be ultimately reflected in a change in the backlog of unfilled orders at the manufacturing level.

Whereas the finished goods inventories held for retail trade are only a part of total inventories, it is reasonable to expect that prompt and accurate knowledge concerning actual movement of goods to the consumer, transmitted to all stages of production and distribution, could be a prime factor in preventing overly optimistic or pessimistic forecasts of demand, which in turn may result in excessive accumulation or liquidation of inventories during periods of expansion or contraction. Generally speaking, inventory behavior at the retail level is a result rather than a cause of change in demand.

Chairman PATMAN. Thank you, Mr. Graham.

Our next witness on the panel is Dr. Thomas M. Stanback, Jr., director of the National Bureau of Economic Research.

Will you please proceed, sir, in your own way?

STATEMENT OF DR. THOMAS M. STANBACK, JR., NEW YORK UNIVERSITY AND NATIONAL BUREAU OF ECONOMIC RESEARCH

Mr. STANBACK. Thank you, Mr. Chairman.

I would like to spend a few minutes in high-spotting the findings which are set forth in the task force report and putting these findings into perspective.

Inventory changes have contributed very significantly to cyclical fluctuation, accounting for 70 percent of all declines in gross national product during postwar recessions and about 25 percent of all increases in GNP during the first year of each postwar expansion.

This observation, that inventory investment typically declines more than other spending during recession and shows its most important increase in early expansion, may be regarded as the single most important fact that the data disclose.

Manufacturers' inventory investment has played a significant role in these movements, accounting for 83 percent of the cyclical nonfarm investment in spite of the fact that inventories themselves are roughly 56 percent on the average of total nonfarm inventories. Among manufacturers' inventories, durable goods inventories have played the major role.

The evidence at hand appears to substantiate a theory of inventory behavior which has been set forth in our report. This theory holds that the inventory movements are determined principally by changes in the level of economic activity, the level of order backlogs, and changes in supply conditions. Briefly, firms require larger stocks to service larger volumes of business. As sales orders rise or fall, stocks rise or fall. The reaction is a lagged one and is not necessarily proportional to changes in activity. Firms producing to order will be influenced by the volume of business at hand as well as the level of activity. When order backlogs are large, they seek to carry larger stocks; when order backlogs are smaller, they seek to carry smaller stocks, all other things being the same.

Firms are guided not only by rate of activity and business in hand, but also by anticipations as to supply conditions, demand changes, and price changes.

Changes in supply conditions are reflected in the rate at which unfilled orders accumulate and in certain other series. The data tell a story of the beginning of deterioration in supply conditions during early recovery, of improvement during late expansion, and a very rapid improvement during recession, accompanied by changes in buying policy and the rate of inventory accumulation.

The effect of these inventory fluctuations is to amplify instability in the system. Any rise in activity sets off an inventory demand which augments aggregate demand, and vice versa.

Moreover, two other factors contribute to the process. The first is the vertical structure of the economy, which has already been mentioned by Mr. Graham. The second is income feedback.

In our economy, production and distribution are specialized and there are many stages. Any changes in final demand, actual or anticipated, give rise to inventory demand on the part of the seller. As this demand is passed back from stage to stage, final demand and inventory demand are virtually indistinguishable. The result is that

demand tends to be amplified as orders are passed through the successive stages of distribution and production.

As regards income feedback, attempts to increase stocks give rise to increases in production. Incomes rise. Consumption and investment spending rise. The attempts to increase inventories are thus partially frustrated by a general rise in demand and this rise in demand causes in turn an even higher level of desired stock.

Now, impressive as this case may be for a major role of inventory investment in our cyclical instability, I think there is some danger of overstating the role of inventories.

Insufficient attention may have been paid in the various inventory study papers to plant and equipment investment which traditionally has been given major emphasis in any discussion of business cycles. Examination of the National Industrial Conference Board data for manufacturers' plant and equipment appropriations shows that these appropriations rise and fall in a pattern which is very similar to that of non-farm-inventory investment. Actual investment expenditures, of course, lag by a number of months. These movements in appropriations appear to be related to movements in profit which rise sharply in early expansion and reverse their movement long before expansion is over. According to the National Bureau of Economic Research studies, explanation of this profit behavior lies in the behavior of unit costs, particularly labor costs.

I do not wish to raise the issue of causation here, whether it is inventory investment or durable goods investment which causes the business cycle. I merely want to point out that plant and equipment investment demand appears to have been very sensitive in our economy and that changes in appropriations have moved along side by side with changes in inventory investment demand.

This synchronization, whatever the reason for it, certainly has much to do with the sensitivity of our system to short, so-called inventory cycles.

Apparently, inventory demand is unstable because the system itself still possesses important elements of instability. If the backlog of durable investment demand were very large, as has been the case in Europe in recent years, and if durable investment demand along with consumer demand were basically stable, inventory investment cycles would be damped and it is quite possible that their rythm would be broken altogether.

Chairman PATMAN. Thank you, sir.

Mrs. Ruth P. Mack, National Bureau of Economic Research.

We are glad to have you, Mrs. Mack.

You may proceed in your own way.

STATEMENT OF MRS. RUTH P. MACK, NATIONAL BUREAU OF ECONOMIC RESEARCH

Mrs. MACK. Thank you.

I would like to call attention to two aspects of the inventory buildup and runoff that may conceivably be subject to some mitigation.

The first is the cumulative deepening of inventory fluctuation at successively early stages of fabrication, which results from efforts to enforce a constant sales-stock ratio. Call this, if you like, the saucer-soup-plate effect. It results from the fact that a company plans

stocks on hand and on order to cover a specified number of weeks of expected sales. As a result, the orders they place with suppliers magnify any change in the orders they receive from their customers. The magnification increases with the size of the intended stock ratio and the vigor with which it is enforced. The magnification is greater at each earlier stage of the vertical sequence.

The arithmetic is simple: A company plans stocks to cover a specified number of weeks of expected sales. Ignore inaccuracy of the forecast which would accentuate the picture I draw. Company A sells 1,000 units of some item each month; stocks are 2 months sales, that is, provisions for 2,000 units. One month supply is on order with their suppliers, company B. In balance, they buy materials for 1,000 units each month from B. But now company A correctly expects sales to drop by 10 percent—from 1,000 to 900 units. The 3-month supply on hand and on order should therefore cover 2,700 units instead of the previous 1,000. Orders on company B, therefore, drop from 1,000 to 700. Company B, applying, let's assume, the same set of rules about stocks on hand and on order, now wants 700×3 or 2,100 units instead of the previous 3,000. Their new orders (on company C) drop from 1,000 to 100. Company C by a similar logic completely stops buying for a while.

Of course, the example is artificially rigid, nevertheless it raises the question of whether dedication to stock planning in terms of the number of months' sales, which implies a constant sales-stock ratio represents a tenacious business myth which may be in need of further scientific clarification. Managerial expertise now asserts that stocks intended to assure against irregularities, shortages and the like, should vary much less than sales (more nearly in accordance with the square root of sales). It also raises the question of whether better information about sales to the final buyer would help companies further along in the vertical sequence plan their operations more efficiently. This is the same point Mr. Graham made.

A second aspect of the inventory problem to which I would like to point concerns the timing of buying with a view to conditions in suppliers' markets. Companies buy further ahead when they expect prices to rise, leadtime to lengthen, or quality to become less dependable. This pseudospeculative demand, and speculative is a poor word, humps demand still further, thus placing, figuratively, a cup within the soup plate. It is important to note that the focus of these considerations is the volume of materials on order, rather than on hand. However, stocks are bound to be affected soon. If a price rise is expected, a company would prefer simply to increase its forward buying—that is, its goods on order—thereby fixing purchase price, without adding to stocks on hand, and thereby incurring the associated carrying costs. Increased leadtime specifically influences primarily, though not exclusively, the volume of stocks on order.

But the expectation of lengthening leadtimes and rising prices are likely to result from, among other things, short-term changes in demand, attributable to the soup-plate effect already described. The somewhat viscous response of sellers to the short-term changes in demand causes some pressure upon delivery periods and prices. The reaction of would-be buyers to these conditions causes a further cupping of demand, as buyers grow more eager and sellers less so. This saucer-soup-plate-cup effect is more often than not disadvantageous

for individual companies. It is disadvantageous, certainly, for the economy as a whole. It augments inventory fluctuation. It probably augments price fluctuation. Furthermore, it may generate an upward trend pressure on prices, since prices, once set in motion, seem to move up more easily than they move down. The importance of expectations in these market-oriented actions probably also generates a capacity for early reversal, which can, by a process that I cannot stop to describe, contribute to bringing on cyclical decline.

Yet to say how the cumulative whip can be flattened requires knowledge that goes to the heart of business decisions and actions. We need to know how businessmen alter their buying of materials in response to actual or expected changes in sales and how expectations about sales are formulated. We need to know how buying is altered in response to actual or expected changes in market conditions.

We cannot now answer these questions with sufficient precision or confidence to provide a sound basis for policy.

We have studied stocks. Stocks are bounded and defined by shipments and receipts. Yet many considerations that result in changes in stocks focus on selling and on buying, sales and purchase orders, particularly the latter, rather than on shipments and receipts.

Experiments in scrutinizing buying yield an informative picture. I am impressed by the fact that the ratio of stocks on hand and on order to sales, for the few broad aggregates for which they can now be visualized, have contours that reasonably may be interpreted as intended behavior, in sharp contrast to stock-sales ratios, which often reflect the inability of management to control the size of stocks, and therefore speak most obscurely of the decisionmaking process.

Yet we have now virtually no industrial statistical information about this obviously critical matter, materials buying. All our statistics on new orders report sales orders only and the industry subdivisions available make it impossible to match these figures in a way that can disclose how a given group of companies relate their materials buying to their sales orders, shipment, production, and the size of the several stockpiles and their rate of change. The single exception is in the case of department stores.

Also required are studies of business practices with respect to buying and selling, as well as those directly focused on stocks themselves.

In short, to aid business or Government reduce the inventory whip, we need, I think, to understand far better than we now do how decisions and actions that influence inventories are made. It seems reasonable to seek this knowledge at the points on which decisions and actions affecting stocks actually focus. For this, new basic information is required.

Chairman PATMAN. Thank you, ma'am.

I wish each one of you panelists would comment on this question: Do you feel that variations in defense orders or in other Government expenditures have been important factors in the business recession beginning in 1960, and the more recent recovery of 1961?

You may start over here, Professor.

Mr. DUESENBERRY. I cannot speak offhand to the recession of 1960, but I think there is no question but what the recovery of 1961 was associated with the rise in defense orders which began a year ago. I do not have the figures on hand for 1960, either.

Chairman PATMAN. All right, sir. Thank you.

Now, Mr. Graham, would you comment, please?

Mr. GRAHAM. I believe that the effect of this pertains principally to the inventories at the manufacturing level. I don't really believe that an appropriate comment can be made with respect to the retailers or the retail inventory levels.

Chairman PATMAN. Thank you.

Mr. Stanback, would you comment, please?

Mr. STANBACK. Well, from the data, it would appear that the effect is probably less than has been experienced in the two previous recessions. To review briefly, appropriations fell sharply from 1st quarter, 1953, to 2d quarter, 1954, and from 4th quarter, 1956, to 1st quarter, 1958. Then as we came into the last cycle Government appropriations appear to have had a great deal to do with the rapid expansion during 1958. But it will be noticed that Government appropriations were irregular during 1959 with a fairly high level attained in the fourth quarter of 1959, considerably after inventory investment had turned down. This would lead me to feel that the role in the downturn was probably less than in the previous cycles.

I am interpreting the data ad lib here, but that there is less instability in the figures than in the previous business cycles is the point I am trying to make.

Chairman PATMAN. Thank you, sir.

Mrs. Mack, will you comment, please?

Mrs. MACK. I think the subject has been covered. I would like to pass on this question.

Chairman PATMAN. All right.

Senator Proxmire, would you like to interrogate?

Senator PROXMIRE. I prefer to wait.

Chairman PATMAN. Senator Pell has been here since we started. I am sure he would have some questions.

Senator PELL. I was struck by the fact, not being too knowledgeable in these areas, that each of the panelists came out with conclusions that inventory levels are really affected by demand.

I am wondering if any of you could express a view as to whether we are going at this in the right way, analyzing inventories, or should we really get at what the demand is, what creates demand?

Mr. DUESENBERRY. Well, this was the burden of my story, so I can only emphasize it. It seems to me there are only a very few possibilities of doing anything directly with respect to inventories. The defense does offer some faint possibilities. But I said to one of my colleagues the other day that any attempt—when inventories are deeply imbedded in our whole production and distribution system and any attempt to change practices with respect to inventories by government action is a matter of putting your hand pretty deeply down into the machinery and you are pretty likely to get your hand ground off in the process.

Senator PELL. Without going into any trade secrets I was wondering if Mr. Graham from Sears had developed any method for forecasting sales and how well your forecast worked out?

Mr. GRAHAM. Well, we use the usual methods that are used in the retail trade. As far as the measurement of our success, I think we have the same degree of deviation that most of the others do. It is pretty difficult to tell, however, as the results of others are not known to us. On a long-term basis we have a good degree of success, say

over a period of 6 months. In shorter monthly periods affected by seasonal changes, and such things as holidays, seasonal requirements for Easter and that type of thing. We miss our demand. But as stated over a period of 6 months or a year, on the longer-term basis, our estimates are reasonably accurate. I do not have any actual figures with me that I can quote.

Senator PELL. Would you be willing to develop the method you use in judging what your forecast would be?

Mr. GRAHAM. We are talking about total inventories in the aggregate for the company. Actually, we don't buy aggregate inventories or dollars of inventory. We buy units, because this is what we sell to the customer. In some cases, it can be said that we buy what we sell. In other cases, unfortunately, we do not always sell what we buy.

We have probably as many cases where we over-buy on individual items as those where we are short. We had an instance recently of a dress, for example, The original demand, our best estimate of it, based on the development of the usual factors that we use in estimating these things, indicated that we would have a total demand of around 10,000 units. Ultimately, it ended up with an actual demand in the neighborhood of 100,000. So you can see we were pretty far off on that one.

Senator PELL. I hope most of the estimates, for your sake, worked out that way. It is fortunate that the estimates worked out that way rather than the other way.

Mr. GRAHAM. I would not say there are too many instances where they are off that far. Estimates of individual items may be long or short but the total in aggregate dollars would tend to balance out.

As far as the development of the estimates, we use the usual procedures that most retailers use. We use our historical knowledge of the particular items or lines, the current rate of demand, some indication of what is expected in the general economy, but for the most part, an application of knowledge of the individual responsible for purchasing the particular item.

Senator PELL. I was wondering if Mr. Stanback would agree with Professor Duesenberry that it is the demand that determines the inventory, rather than any other factor.

Mr. STANBACK. Well, the role of inventories, I think, needs to be brought out here, it is both cause and effect. On the one hand, with a higher level of economic activity, there is a need for more inventory and at a lower level there is less, conditioned, of course, by certain other factors.

On the other hand, the impact of inventories is in the change. If the change is large, then there is a demand for the factors of production, or resources. If inventories continue to rise but rise by a lesser rate, then there is less demand. The inventory demand actually may decrease with an increase in inventories.

Now, the point here is that inventories, because of this fact, occupy a very strategic position. If they are accumulated at increasing rates, then they add to overall demand. But if the rate begins to decline, this constitutes a weakness, a diminution in demand, and this is the point at which inventories can play their own role.

So they take on a casual role. We have noted in our paper that inventory investment, rather than inventories, has turned early in

each expansion. We are not supposed to get into this issue of turning points, but it is rather important to bring it out in connection with our report. And of course, as this inventory investment demand declines, that may drag other things with it. Conversely, after a trough or during the recession, if the rate at which inventories are being pulled down is increasing, there is a drag upon the economy. But if this diminution in inventories begins to slacken, there is actually a positive force.

Here you have inventory investment's role per se.

So I think in answer to your question, you do not just simply look for final demand, you look to inventory investment as a separate phenomenon.

Senator PELL. What would be your view as to the advisability of a system of monetary controls and perhaps credit controls for goods that are in oversupply?

Mr. STANBACK. Well, it seems to me that it is important to note that inventory investment is localized, that it occurs principally in manufactures and principally in durables. If there is any way to get at the seat of this trouble by some other device, it might be a more efficient way than to attempt to apply general controls or general devices aimed at flooding the economy with money or influencing aggregate demand, when it seems to me a localized source of instability.

Senator PELL. You don't think there would be too much interference with banks by Government with respect to controls?

Mr. STANBACK. It is not a philosophical point; it is one of efficiency. But I must confess that I am not sure what methods would be best. The matter of measures to combat inventory fluctuations needs a lot of study. I have one suggestion which though not dramatic may have considerable promise: as I pointed out before, inventory demand and final demand are indistinguishable to the firm receiving an order, and this results in amplification and erroneous expectations which are passed down the line. If Government data could be collected and presented in such a way as to expose this process to the businessman it is probable that irrational inventory accumulation and deaccumulation would be reduced. The Department of Commerce has taken steps in this direction in the cases of textiles and steel, but much remains to be done.

Chairman PATMAN. Thank you.

Senator Proxmire?

Senator PROXMIRE. Yes. I have some questions.

I notice, Professor Duesenberry, in your statement you say:

> In the case of defense goods it seems clear that the Defense Department ought to take some cognizance of the impact of its orders policy on the economy generally.

You go on to say that when the international situation changes and thus, obviously, affects directly and must directly determine the defense policy, that then they cannot do so, but under other circumstances, they perhaps should.

Have you made any specific study or are you aware of any study of the possibilities for this constructive suggestion you make?

Mr. DUENSENBERRY. Well, I know of some experience the other way, particularly 1957, when efforts were made to control expenditures primarily for budget reasons. There were some rather sharp

changes in the whole orderly program, which produced sharp changes in activity, particularly in the aircraft industry.

Senator PROXMIRE. When was this?

Mr. DUENSENBERRY. In 1957. In the fourth quarter of 1957, inventories held by the aircraft industry declined by about $4 billion, which is a billion dollars annual rate, which for that quarter, is a very substantial annual decline.

Now, it is my understanding that that was a matter of budgetary reasons rather than defense policy in the larger sense. I think it is also true that we have a situation in the Defense Department with programs which involve long leadtimes which are adopted and we do not have at present a real system for calculating the total impact of those programs on the economy. When we adopt a new program which involves a speedup in activity in some sector, and then a leveling off at some later date, we have no real system for judging what the total impact of those variations is in order will be.

Now, sometimes nothing can be done about them, but there may be times when there would at least be an advantage to know what the impact would be so that possibly offsetting action in some other area could be taken.

Senator PROXMIRE. It would be very useful and interesting to have a study to indicate what the possibilities are, but I am somewhat pessimistic about the usefulness of this in view of the experience that we had in the spring of 1961, when President Kennedy suggested that the Government change its rate of spending for economic reasons.

There was not much of a change. As I recall, the testimony before us indicated that it might have changed spending by $200 million or possibly $300 million of the $80 billion budget, or a fraction of 1 percent. While the effect would be a desirable one, possibly, the effect would not be very substantial.

Now, if this were directed at inventory policy, similarly, the consequences would not be very significant, in your judgment, or would they?

Mr. DUESENBERRY. Ordinarily not. It is just that there are times when there is a big change in ordering policy. It should be noted that the effect of change in orders is sometimes a good deal bigger than the expenditure effect, because we have long leadtime items which sometimes take 3 years to produce, so the expenditure effect is spread over a long time, since the Government pays, or at least we record in the national income accounts on delivery, the Government pays actually on a progress basis, but we record the progress payments as inventory in the national income accounts.

I had some discussion of these problems with Mr. Hitch, and possibly when he appears, you can tackle him on this point.

Senator PROXMIRE. At any rate, in your judgment, you have no reason to suggest whether or not this would be in the area of hundreds of millions of dollars or several billion dollars in a year?

Mr. DUESENBERRY. Well, I think it is clear that in the 1957 case, the effect was very large, this was a matter of a billion dollars in a very short time. Also, in that period, if you look at the Government expenditure figures, there is almost no change at all, because the orders resulted in a reduction in activity in the aircraft industry, but the orders were then stepped up again at a later date before the deliveries to the Government were affected at all.

So it is a matter of big changes of what is within the pipeline, with much smaller changes in what goes out of the pipeline at the final end. So these can be of substantial magnitude.

Senator PROXMIRE. Then, you say:

> When there is a clear signal that no rise in sales can be expected producers may then cut back production sharply in order to adjust inventory to their new sales expectation.

And you go on to say that this was of considerable importance in the 1957–58 recession. Would you say this is because of the lags in monetary policy or fiscal policy?

Mr. DUESENBERRY. When I said directly related to inventories, I meant that action which was—we were trying to work on the inventories themselves without any intermediate steps would not be effective.

Now, in the case in point, had we taken some action to improve the rate of growth of demand at an earlier date, then that probably would not have occurred.

This was a case, if you can recall, in which all the forecasts during the spring of 1957 and even as late as June were rather optimistic for 1957. If you look at the hearings of this committee in June of 1957, all of us economists were still giving out fairly cheerful forecasts and producers were not getting sales at the rates which they had anticipated, but they were all talking about a recovery in the fall and held their production rates until the fall, when they became convinced that it was not going to come off. Now, if we had used better forecasting or had been better prepared to take a longer chance on an expansive action in the monetary field or in the tax field, we might have avoided that problem.

In general, a lot of the inventory fluctuations would be ironed out if we could take early action of an expansive nature at the point of a downturn.

Senator PROXMIRE. But unless you can find indicators which are pretty far in advance of the turndowns, forecasting is risky and uncertain, whether you accept the Friedman and Mayer studies indicating a lag of 17 months in the use of monetary and fiscal policy between the time the policy is instituted and the time it has its full effect, or whether you reject that and say the lags aren't that great—in either event, as you point out, the economists were divided at best in the spring of 1957, and we would probably wait until we get the consensus so it would seem we could not put into effect a fiscal or monetary policy that would give us a desirable conservance in inventory change.

Mr. DUESENBERRY. No; I think we can only make a case for being prepared to take early action and taking action at the first time when there is a consensus. To take this same example, there was a consensus, I think, by the late summer—at least there was a consensus in New York, if not in Washington, that things were going to slow down. But we did not take any action, we were still talking by January, we were still raising the question as to whether any very strong action should be taken. Monetary action was taken in November.

But I think we have been a little bit slow, generally, on expansive actions at the turn of recessions, even granting that we aren't very good at forecasting them months ahead.

Senator PROXMIRE. Now, let me ask you this: Do you think there is adequate documentation for the idea that cyclical unemployment

is caused specifically in those sectors of the economy where the inventory cycles are most evident?

Mr. DUESENBERRY. I suppose you could make a fair case that the unemployment fluctuations appear to be in the durable goods.

Senator PROXMIRE. That is a generalization. Can you be specific?

Mr. DUESENBERRY. Not at the moment. I think this could be documented, but I don't have the figures with me.

Senator PROXMIRE. Is any other member of the panel aware of a study which has indicated that this is the case or not the case?

(No response.)

Senator PROXMIRE. I will ask one more question before my time runs out. Would there still be an employment—there would still, I take it, be an employment problem even if inventory cycles were ironed out. It would simply be that instead of having a variation of from 5.5 to 7.0, it might level out at 6.3 or 6.4, or somewhere in between?

You are not arguing that if you level out the inventory cycle, you are really going to do something substantial about reducing unemployment?

All you do is reduce the fluctuations; is that correct? Or do I misunderstand the position?

Mr. DUESENBERRY. Well, it is a little hard to get the total impact. It is certainly true that there is some canceling out, in the sense that we have a reduction in inventories and then a recovery, that we have a period of below average inventory formations—in fact, negative—and a period of above-average inventory investment and these wash out. But it is a little hard to say what the total secondary impact here is, whether in the absence of the cyclical swings, for instance, the whole level of private investment might be somewhat higher because there will be somewhat smaller risks.

I think it is fair to say you would not solve the whole unemployment problem by eliminating the inventory problem.

Senator PROXMIRE. Is there any evidence that you would diminish the secular unemployment?

Mr. DUESENBERRY. I do not think there is any strong evidence. The effects would be rather secondary.

Mrs. MACK. It may be that one would have a pretty substantial effect if it were possible to remove only a part of the inventory cycle. I do not think that one can hope to remove the bulk of the inventory cycle. The problem is to remove some substantial portion of it.

Total inventory fluctuation is, as Dr. Stanback has indicated, a very big hunk of business fluctuation these days. If one could smooth this out to a moderate extent, it would improve not only the cyclical but also the secular picture. The length of time during which prosperity can be maintained is an inverse function of how rapidly things increase, when, as tends to be the case for inventories, the rate of increase tends to reach a limit and halt. In other words, you introduce a big spurt which cannot continue, and which, as it levels or reverses, weakens the economy, thereby sensitizing it to other possible shocks which may cause a general decline. If one could maintain a steadier and, in certain periods, a less extreme rate of growth, there is reason, I think, to contemplate the possibility of more extended and, over a period of time, a greater net rate of growth.

As to the portion of the inventory cycle that one ought to think of as at all as possible mitigation, this is, I believe, very small. Therefore one's sights must be very modest.

This is particularly true in connection with general credit controls. I think it is important to realize that we have really, as far as I know—and I wonder whether other members of the panel would agree—virtually no support for the notion that interest rates play a very active role in business judgments about inventories. The National Industrial Conference Board survey just published here showed that credit conditions tended to be the least important of the factors that companies say influence their inventory actions.

Chairman PATMAN. Mr. Widnall?

Representative WIDNALL. Thank you, Mr. Chairman.

Mrs. Mack, I think you in part answered what I was about to ask relating to testimony of Professor Duesenberry. He stated that it is generally believed that firms tend to accumulate extra inventories when they believe that delivery periods will increase and tend to reduce inventories when they believe the delivery periods will shorten. There is, therefore, a tendency for the rate of inventory accumulation to rise as the rate of capacity utilization rises and to fall when capacity utilization falls.

That, of course, he says, accentuates the tendency for the ratio of inventory investment to rise and fall with the rate of growth of output.

My question is whether or not there is any evidence that interest rates or the terms of loans have any marked effect on the accumulation of inventories. I think you in part answered that before.

Mrs. MACK. Yes. As far as I know, there is no really convincing evidence on that point. I would like to add that it is not only a high level of output or a utilization that causes a lengthening of advance buying; the rate of change is also very significant.

In other words, these short-term buildups, which I referred to as the soup plate effect, are responses, in part, to demand of quite short term. A short-term pileup in demand can influence the speed with which suppliers may be expected to fill orders, the prices that may be charged, and the reliability with which specifications will be met. Therefore the rate of change as well as the level of demand has some part in this buildup.

Representative WIDNALL. I am particularly interested in this because of the difference of philosophy that some people have with respect to interest rates. Professor Duesenberry, there is a lot of interest on the part of some people to stimulate the economy by having low interest rates.

We have seen foreign nations with high employment and with high industrial capacity, fully utilized, having much higher interest rates than we have here.

Is it a drag on the economy to have lower interest rates?

Professor Duesenberry?

Mr. DUESENBERRY. Well, I think there are two points to be made. One is, of course, that significance of interest rates has to be put in the total context of the economy situation. If you have an economy with a basically very strong investment demand, it may do very well, have very strong investment, a very high rate of growth, in spite of having high interest rates. It may be that in some of the European countries, which are developing rapidly, adopting techniques which

we adopted years ago and are expanding because of the Common Market, that their basic investment demand is so strong that it has to be held in check. So that when we speak about the effect of interest rates, we can't suppose that the interest rates are the cause of the whole difference in the picture.

The second point, though, is a different one, that many people think that much of the effect of interest rates is not really the effect of the level of interest rates, but is connected to the rate of change of interest rates, that much of the impact of a restrictive monetary policy takes the form of rationing, if you will.

The outstanding example is the guaranteed and insured mortgages, where we have problems about the ceiling rates, so that in effect, credit is rationed because the institutions will not lend freely at the ceiling rates when bond rates are higher relative to those rates.

It is also true at the bank level that probably the restrictive effect is not primarily due to the fact that the rates are high, but to the fact that the bank funds are in short supply and banks choose to distribute their funds on a rationing basis rather than by setting a rate which would be high enough enough to clear the market on the basis of strict competition.

Now, one of the things that that means is that if we edged up from cycle to cycle at a gradual rate to higher interest rates, we might not have nearly as restrictive an effect as if we had achieved the same final level of rates over a shorter period.

Now, I don't wish to say that the level of rates in itself has no impact, but I do think it is true that the effect which monetary policy has over a cycle, when rates change at a rapid rate, is much bigger than the effect of the difference in rates when you compare two periods fairly far apart.

Representative WIDNALL. Is there any evidence that business goes in for inventory accumulation when they can get longer term credit?

Mr. DUESENBERRY. I don't think there is any evidence of that.

Representative WIDNALL. This does not seem to have any material effect?

Mr. DUESENBERRY. I have never seen any real suggestion of that. My impression is—we have done an elaborate interview study of bank lending practices. My impression is that the highest priority borrowers in a tight money period are the regular business borrowers who are regular borrowers for inventory purposes. This is one of the backbones of the banking business and those are the customers who get credit most readily, by comparison with people who want term loans for fixed investments or people who want loans for security speculation or for construction loans, things of that sort, who are much more unstable customers.

Representative WIDNALL. You stated that steel strikes and the anticipation of steel strikes have caused some major fluctuations in inventories in recent years.

Is it your belief that labor-management peace could have one of the greatest influences on stabilization of inventories?

Mr. DUESENBERRY. Certainly if we had avoided the episodes in steel, we would have stabilized inventories in the last couple of years. You only have to look at the charts of inventory investment in the first half—throughout 1960, when we had very high investment in the first two quarters, then, of course, low investment in the steel strike

quarter, then a very sharp recovery of inventory investment in the fall, and the same thing in the first quarter of this year—I think there is a very strong indication that the inventory fluctuation was deeply influenced by the steel strike. It was not all just inventory of steel, but people who try to acquire all sorts of components in anticipation of short supplies.

Representative WIDNALL. Do you have any chart or do you have any information that you can submit for the record that would show the difference in percentage of inventory accumulation as applied to Government and business during specific periods, or do you just say that in a time of recession, there is more of a Government accumulation of inventory than there is business?

Mr. DUESENBERRY. You mean inventory by Government?

Representative WIDNALL. Didn't you say in your testimony that in a time of recession, a government tended to accumulate inventories while business tended to decrease inventories? Maybe I misunderstood.

Mr. DUESENBERRY. No; I do not think I said that.

Representative WIDNALL. Do you have any comparison at all as between Government and business?

Mr. DUESENBERRY. You are speaking of Government-held inventories?

Representative WIDNALL. Yes.

Mr. DUESENBERRY. There is information on Government-held inventories.

Representative WIDNALL. Outside the regular cycle. You didn't bring anything with you?

Mr. DUESENBERRY. No; I didn't bring anything with me.

Representative WIDNALL. Thank you; that is all.

Chairman PATMAN. I want to ask one question of the panel.

The task force report states that declines in inventory investment have accounted for 70 percent of the declines in gross national product during the postwar recessions, but some other economists have stated that this pertains to about 100 percent if both the direct and indirect effects are taken into account. Is there general agreement among the panelists on these figures?

What do you say, Dr. Mack?

I will address you by your proper title.

Mrs. MACK. Thank you.

I think that the second estimate, insofar as it says "when secondary effects are taken into account," is almost bound to be highly hypothetical. I do not believe that we have at the moment any safe way of giving quantitative measurement to secondary effects. Besides, I think it can be somewhat misleading to think in these terms, because whatever secondary effects are taken into account in judging the role of inventory investment in cyclical fluctuation need also to be taken into account in judging the role of, let's say, fluctuations in consumer demand or anything else. Ergo, I would stay with the 70 percent figure, that is with the direct effects, noting the fact that there is some further magnification.

Chairman PATMAN. Any other comment from the panel?

Mr. STANBACK. I would agree, and also add that even the 70 percent is misleading, in that there are some components such as government expenditures or foreign trade which may move upward during

recession, so you get the impression when you talk in terms of very large percentages, like 70 percent or 100 percent, that there is really nothing much to the cycle but inventory fluctuations, that durable goods investment changes do not play very much of a role, whereas they really do. So I go along with Mrs. Mack. The data are ambiguous at best; I would prefer simply to use the recorded percentage.

Chairman PATMAN. We have about 40 minutes more, but I would like, sometime during the remainer of the time, to permit the panel to ask one another questions.

There are some charts, I think, that members of the panel would like to explain. Would any member of the committee like to ask questions now, or shall we proceed with the discussion of more of the panel?

Senator PROXMIRE. Whatever you say, Mr. Chairman. I have some questions. I would be happy to wait.

Chairman PATMAN. Any member may interrupt at any time by making comments or asking questions.

All right. We will start with Dr. Mack, then.

Would you like to ask questions of the other members of the panel?

Mrs. MACK. Let me wait a moment, if I may.

Chairman PATMAN. All right, Mr. Stanback.

Mr. STANBACK. Well, I am in a position of having tried to put down what I know about inventories in the form of my own study paper, and the task force hearing survey. I am not sure I have any question just now.

Chairman PATMAN. Suppose you comment on your chart, Dr. Stanback, if you would like to. You have charts 1, 2, and 3. These are your charts, are they not?

Dr. STANBACK. Well, I could do that.

Chart 1 is general information and bears out what I tried to say earlier. It shows that it is the accumulation, the rate of accumulation in inventories that plays the major role.

It is the departure from the zero line that accounts for the change in demand for resources. You will notice that it is only when the line crosses the zero line and goes below that there is any decline in inventories, which is quite late, generally, tending to lag the business cycle. But the impact of decline in inventory investment begins quite early when the rate of change turns down. Similarly, when the line moves upward, you still are drawing down on inventories, but the rate at which you are drawing down is diminishing, so the impact is diminishing. The other thing to note is that total manufacturing plays a major role. The chart is not exactly what it should be, in that we changed the scale for purposes of showing the timing a little better. But I think you can make out that manufacturing inventory movements play the major role.

Chairman PATMAN. Would you like to insert these in the record with explanatory notes, Dr. Stanback?

Mr. STANBACK. That would be quite all right.

Chairman PATMAN. Without objection, you may do that.

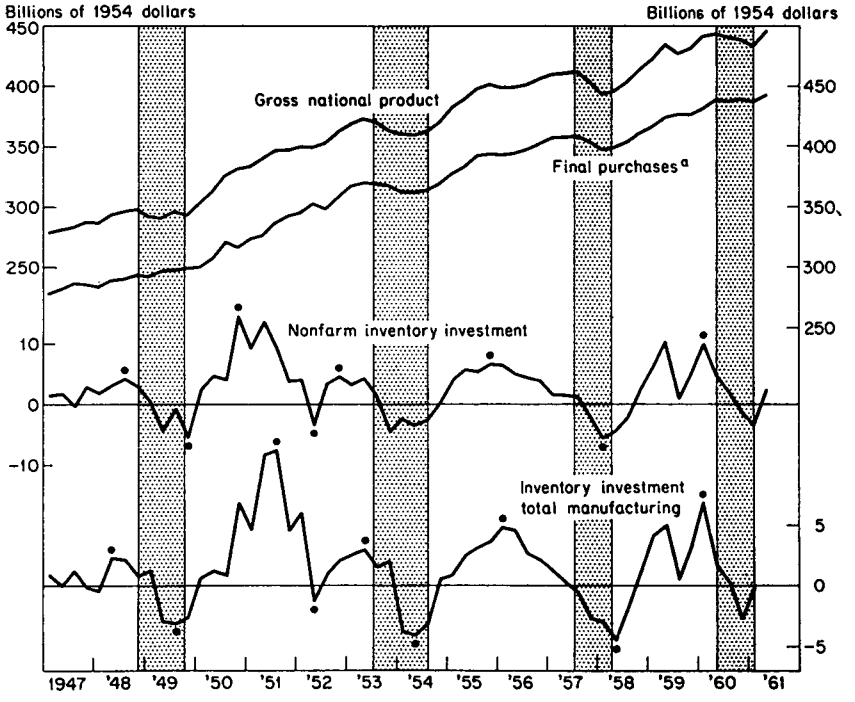
And the other panelists may insert anything that is germane and material.

Chairman PATMAN. You may put those charts in with your explanation of them.

(The charts referred to are as follows:)

CHART 1

GROSS NATIONAL PRODUCT, FINAL PURCHASES, AND INVENTORY INVESTMENT, QUARTERLY AT ANNUAL RATES, 1947–61



[a] Final purchases equal GNP less total inventory investment.
Shaded areas represent business contractions; unshaded areas, expansions.

Source: Department of Commerce.

CHART 2

GNP final sales (excluding services and construction) in upper panel; net change in nonfarm inventories in lower panel; seasonally adjusted quarterly data at annual rate in billions of constant 1954 dollars, 1948–I through 1961–I

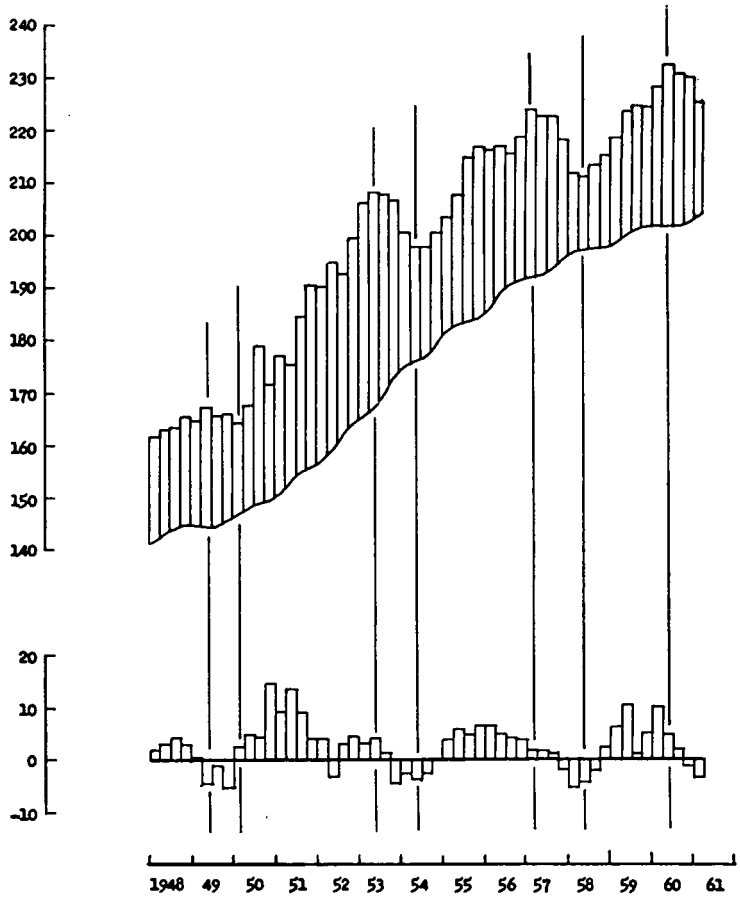
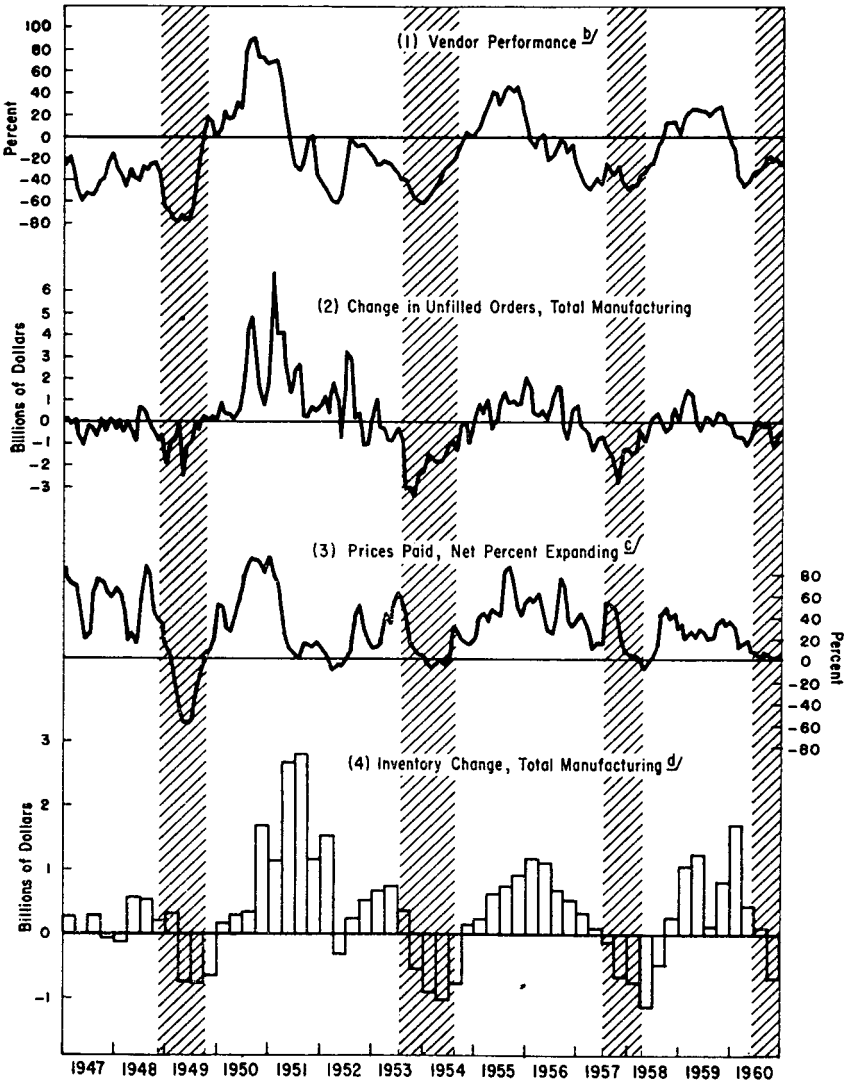


CHART 3

COMPARISON OF VENDOR PERFORMANCE, CHANGE IN UNFILLED ORDERS OF MANUFACTURERS, PRICES PAID BY PURCHASING AGENTS, AND MANUFACTURERS' INVENTORY CHANGE a/, 1947-1960



a. Shaded areas represent business contractions; unshaded areas, expansions.

b. From monthly reports of member agents of Purchasing Agents Association of Chicago: Percentage reporting slower deliveries minus percentage reporting faster deliveries.

c. Percentage of member agents of PAA of Chicago reporting paying higher prices minus percentage reporting lower prices.

d. Quarterly Change in Manufacturers' Inventories after inventory valuation adjustment, seasonally adjusted in 1954 dollars. Source: Department of Commerce.

Chairman PATMAN. Mr. Graham, would you like to ask any questions of the panelists?

Mr. GRAHAM. No, sir; I would not.

Chairman PATMAN. Mr. Duesenberry?

Mr. DUESENBERRY. Let me make some comments on Mr. Stanback's chart.

You will notice on chart 1, the second line is marked "Final purchases." You will notice the fluctuations in that are very small. In the 1953–54 recession, the final purchases line hardly goes down at all.

In 1957–1958, it goes down a bit and in 1960, it is just about level.

Now, I think that is a little deceptive in that the final purchases are final purchases of goods and services. In this economy, in recent years, there has been a rapid rise in service production, services of owner-occupied housing, financial services and services generally, so that if the second line were revised to read "Final purchases of goods," it would show much more marked cyclical fluctuations than the total final purchases line. This is connected to that point about the 70 percent and the point Mr. Stanback made, that some items go up in a recession. One of the largest items to go up is the production of services. By and large, consumer services tend to rise right through recessions and so do a good many Government services.

Chart 2, then, brings out the point clearly. I take it the top line is—which is final goods without services?

Mr. DARLING. The top line?

Mr. DUESENBERRY. So that those dips indicate the movements of goods production. That is the point which I wanted to bring out.

Chairman PATMAN. Senator Proxmire, would you like to ask some questions?

Senator PROXMIRE. Just following up the last point that was made, it would seem that final sales of durable goods fluctuate a great deal, fluctuate very, very sharply, and even if you should keep inventories fairly constant, somehow you would still get a great impact, a cyclical impact on the economy through the fluctuations in the final sales, disregarding inventory, is that correct?

Mr. DUESENBERRY. Yes; we get, after all, substantial fluctuations in plant and equipment. In 1957–58, as I recall, the plant equipment fell from about $37 down to about $29 billion, if I recall the figures accurately.

There is some fluctuation, of course, in construction as well, and consumer durables show substantial fluctuations.

Senator PROXMIRE. As a matter of business practice, isn't it true that a lot of corporations will just automatically key their inventory purchases into their sales and not try to guess or anticipate a great deal that is likely to happen? If they try to follow a policy of guessing, and they are no better than most economists are, with all deference to the profession, it seems to me they might get into a lot of business trouble, whereas if they follow the policy of keeping their inventory in a particular relationship to sales, it seems to me it is a logical way to proceed, businesswise, whereas if they tried to guess——

Mr. DUESENBERRY. I think Mr. Graham can answer that.

Senator PROXMIRE. I think Mr. Graham has already told us that there is quite a difference in retailing as compared with manufacturing.

They do follow a policy pretty much of relating their inventories to sales; is that correct?

Mr. GRAHAM. That is correct, relating the flow of inventory to the sales but not necessarily the sales level. In other words, depending on the service of supply, the rapidity with which the inventory can be replaced and so on, the retailer determines the inventory level in relation to the demand.

It definitely is tied to the demand, but these other factors also enter, such as the replacement cycle and the timelag in getting the merchandise physically to the shelf for delivery to the customer.

Senator PROXMIRE. But there is no—this is quite different and I want to ask Dr. Mack and Mr. Stanback about the durable goods. But as far as the retail field is concerned, there is not any feeling of pessimism on the part of purchasing agents or on the part of the corporation heads which would direct them that they had better have a tighter inventory policy and reduce the size of inventory? What they simply do is try to relate it on pretty much of an arithmetical basis, isn't that correct, as to what sales actually are and orders are?

Mr. GRAHAM. That is correct.

Mrs. MACK. I think if one looks at these overall department store figures there is some suggestion that policy changes from time to time. I am talking not about the relation of inventories to sales, but of this total flow Mr. Graham is speaking of—insights. If you take this total gap, which is changes in goods in stock and on order, this aggregate will change in its relationship to sales. At the present time, for example, in the department store field, the ratio is reasonably high. It is at the level where, at other times, it has tended to be reduced somewhat. The changes are subtle, but after all, a fairly subtle change can make a considerable difference.

Senator PROXMIRE. Can you give us an idea what the amplitude of these changes are in department stores?

Mrs. MACK. They range from about 3.5 to 4.2, which is about 20 percent, up or down.

Senator PROXMIRE. Did you use the figure 3.2 to 3.5?

Mrs. MACK. I said 3.5 to 4.2. In manufacturing, it is relatively considerably wider, though it differs, again, very much for different manufacturers. For example, for nondurables——

Senator PROXMIRE. Do you have studies in economic research which actually show there is a variation that is sometimes 3.5 percent of sales and sometimes 4.2?

Mrs. MACK. As a matter of fact, these figures are in the monograph that I did for this study.

Senator PROXMIRE. I am talking about retail.

Mrs. MACK. Yes; the department store figures are, and the durables.

You see, in a sense, a manufacturer who carries a 5-week supply of materials stock on hand and on order when sales are low, and an 8-week supply when they are high, may not pay much attention to this variation. But after all, it represents a 66 percent or more variation in the relation of stock on hand and on order to sales, and sales themselves will be moving also. Apropos of your previous question, is it only a change in demand, final demand, or does inventory buildup really contribute some additional whip—you see, the change in the ratio constitutes additional whip.

Senator PROXMIRE. Have you determined whether or not this is related to cyclical anticipation, or whether it is related to changes in style, changes in various other things, or may be seasonal factors? Seasonal factors, I should think, would be enormously important.

Mrs. MACK. Yes; and you are perfectly right. To see the kind of thing I am talking about, one must "eliminate the seasonal element."

I say this in quotes, because there are all sorts of techniques for doing it, nobody is ever satisfied with the net result. This is the kind of thing I am talking about, where you have taken the seasonal element out.

As to the change in the ratio—you asked whether this was related to anticipations of changing sales. The total ownership position—materials stocks on hand and on order—move up and down more or less with sales. This implies anticipation or at least prompt response and orders can respond promptly. But, in addition, the ratio tends to move up and down with crude material prices or with shifts in the speed of deliveries, the leadtimes. So that these elements which would seem reasonably to influence the decision about how far ahead of your current sales you ought to be placing orders for materials, these things—namely, do you expect a rise in price, do you expect delivery periods to lengthen—do seem to show in this ratio.

Senator PROXMIRE. What puzzles me so much is that as Professor Duesenberry said, it is an indisputable fact that there has been a steady rise in distribution of services and, as I understand it, in soft goods, what the department stores sell, Sears, Roebuck, and so forth, this has been fairly constant and has prevailed right through cyclical troughs. It seems to me quite irrational for retailers, therefore, to vary their inventory policy to meet a cycle in durable goods that doesn't affect them.

One new factor that has been called to national attention, Time had a big story on it just a week or so ago, is the discount business, which has had tremendous impact on the retail field. Possibly their inventory policies are quite different, and maybe if you compare the situation in 1952 with the situation in 1961, you might get quite a difference in inventory size that has nothing to do with the cycle but has a lot to do with what the retailers are now offering.

Mrs. MACK. I am quite sure the change in goods sold will have something to do with the change in inventory sizes. But I think you are now talking about trend changes, where I was talking about cyclical, short-term fluctuations. These fluctuations are the things which will be influenced by judgments about market conditions and by the rate of change in sales proper. But the point is that they do have this further wallop. It is not simply a reflection, one for one, of changes in demand.

Senator PROXMIRE. Mr. Graham, is this, in your experience, in Sears, Roebuck, do you think this is common among the businesses with whom you dealt? Does Sears, Roebuck, for example, follow a policy of 30 percent change in inventory?

Mrs. MACK. I didn't say change in inventory.

Senator PROXMIRE. I thought you said it might vary from 3.5 to 4.2.

Mrs. MACK. Goods on order and on hand.

Mr. GRAHAM. I believe what Mrs. Mack is talking about is stocks on shelf and on order, in transit for delivery. I would not say there is a direct percentage of change that is experienced. I go back to

the retailers' desire, which is to fill the requirements of the customer at the time that he appears on the floor and wants to buy some merchandise. The factor of leadtime in replacement of inventory certainly is something that is taken into consideration, and will affect the amount and frequency of the orders. The further the order period is extended because of the lag, the amount of the order portion of the total insight will increase. But the inventory levels themselves will have a tendency to remain somewhat constant in relation to weeks of sales in the closeup period.

Senator PROXMIRE. Would you be surprised if you found (or would you) that even allowing for all seasonal changes, that you had the kind of dramatic change that Dr. Mack has suggested, 3.5 to 4.2 relationship? This astonishes me. I have had some experience, but very little experience in retailing.

Mr. GRAHAM. In terms of total insight, if you are speaking in the aggregate, there will be a substantial change in terms of time period, because of seasonal fluctuations.

Senator PROXMIRE. But seasonal fluctuations, Dr. Mack said, are carefully eliminated.

Mr. GRAHAM. I have no evidence on this and I would say I would be surprised; yes.

Senator PROXMIRE. I have just one other—did you want to comment further, Dr. Mack?

Mrs. MACK. I thought you might be interested in looking at this chart that covers 1946 to date. The total range ran from a figure in the neighborhood of 4.8 in 1951 to 3.2 in 1949. Now, of course, this is a very wide range, applying to most unusual conditions. As a matter of fact, in 1946 the figure ran up to 5.6. It had been high during the war, of course.

In more recent years—well, at the present time, of course there is a jumping up and down, but it seems to run about 4.1, and in 1954, at the trough of the cycle, it was 3.6. That is somewhat less than the total range that I mentioned first. But of course I was talking about the total sweep and I gave you a figure that was far less than our historic maximum shifts.

Senator PROXMIRE. These fluctuations are far greater than I would suggest are fluctuations in sales of the department stores, are they not?

You are not suggesting that the department store sales——

Mrs. MACK. This is a ratio.

Senator PROXMIRE. I know it is, but if you take the trend of sales during that time, it is pretty steadily up. The year 1958, a recession year, was probably higher in department store sales than 1955, which was a far better year cyclically. But the inventories did fluctuate.

Mrs. MACK. Yes. And it is interesting that the ratio is virtually free of trend.

Mr. DUESENBERRY. I think there is a little confusion here. This figure includes orders and inventories.

I think if you take the swing in inventories only, you will find a much smaller variation. This means you will get a low ratio in 1958 because department store owners know that they can get very quick delivery, so that they can afford to order on much more of a hand-to-mouth basis.

I think this accords with the kind of thing which you read about purchasing agents, when we have those reports of the purchasing agents' policy, when they sometimes say that their policy is to order so many months ahead, sometimes they say that they are living on a hand-to-mouth basis. I think this means that a lot of the fluctuation which Mrs. Mack is talking about is taken up in the orders outstanding but unfilled, which can get very low when the manufacturers have excess capacity and maybe have excess stocks of their own and are prepared to ship very fast.

Mrs. MACK. Of course. One is interested in it because, to a marked extent, it represents the way in which information about retailing gets shifted back to earlier stages.

It is shifted back via the orders that the manufacturer receives. And this kind of whip is in the pattern of his information, his orders.

The manufacturer gives another flick to the whip. Here we do not have the appropriate figures but I have tried to make a rough estimate of them for durable goods manufacturers. The figures are given in my monograph.

The ratio of stocks of materials on hand and on order to shipments is much smaller than for department stores. But it fluctuates somewhat more widely. In 1949 my estimates of materials on hand and on order represented 1.7 months shipments. The ratio rose to 2.7 in 1951, fell to 1.2 in 1954, rose to 1.9 in 1956 and has been bumping a low of 1.3 during the last 2 years. It is still quite low, unlike that for department stores.

In my prepared remarks I urged the collection of this sort of information for manufacturing. Specifically what is needed is statistics on outstanding purchase orders from the same companies that supply the information on outstanding sales orders and stocks to the Bureau of the Census. For department stores they are needed separately for a few major departments.

Our discussion here has brought out several points about the story that these figures can tell: they reveal the fillip that sequencial stages of production give to such instability as appears in final demand; they reveal when it occurs; they appear to show what businessmen mean to do, whether with a view specifically to the management of stocks or with a view to other business problems; they indicate what will happen to stocks a little later on.

Senator PROXMIRE. I see.

I would like to ask one other question. You said that credit restraint or the availability of credit, with interest rates, were probably the least important factors in those effects on inventory size, on the basis of studies; is that correct?

Mrs. MACK. I think I probably said that I know of no evidence that indicates a sensitivity of business decisions about the size of inventories or advanced orders to short-term changes in interest rates. I would agree with what Professor Duesenberry said on this score, that there may be some rationing element that moves at the same time that interest rates move. Not perhaps for the big business with conventional lines of credit, but rather for the small company that is trying to get credit.

Senator PROXMIRE. Exactly.

Mrs. MACK. There are also conventional seasonal patterns to borrowing. It will be difficult for a man to get additional credit if his

credit line is higher at a given month than convention within the industry indicates that it should be. The seasonal cyclical factors may interact. But as far as the interest rate itself goes, here I know of no evidence.

Senator PROXMIRE. I think it is interesting that you suggest that if there is an effect from the rationing standpoint, certainly when free reserves of our banking system drop as sharply as they did in June, for instance, we can conclude that in some areas of the country, there is likely to be credit rationing, that the rationing would be with the small business, if only because the big business so often has internal sources of financing, and has all kinds of ways they can secure the funds, No. 1.

No. 2: Is that you are talking about inventories exclusively and the situation might be quite different if businessmen are thinking of borrowing to expand a plant, borrowing for any other kind of purpose than inventory.

Inventory, as I understand it, particularly as Dr. Duesenberry said earlier, would enjoy a very hard credit priority even when credit is tight, it would be relatively easily available. For one reason, it is easily liquidated; the bankers are used to dealing with it; you have collateral right there in the store or the manufacturing firm which can be liquidated, and there are all kinds of reasons why I can see that the monetary policy would have its least effect here. You are not saying, however, that the monetary policy cannot have a very serious effect on business decisions, other than inventory?

Mrs. MACK. Certainly not. My remarks were limited entirely to the inventory question.

Senator PROXMIRE. Thank you very much, Mr. Chairman.

Chairman PATMAN. Any other questions by the members?

Mr. Widnall?

Representative WIDNALL. Mr. Graham, in your testimony you spoke about the sensitivity of inventory to sales. Now, when does it really reflect itself in determination of policy by Sears? After a day, 2 days, a week, a month? When do you feel it is important to make a major change in policy?

Mr. GRAHAM. When I spoke of sensitivity, I spoke of that in relation to the entire cycle from the consumer demand point back to the manufacturing area, where the lag is, generally speaking, much longer. In our case, it depends upon the type of merchandise and the nature of the goods itself. As the demand is reflected, again tied into the cycle of replacement, and depending on the nature of the goods, the decision to change coverage would be different and would determine how rapidly we could effect the change.

Representative WIDNALL. In the past 15 years, for instance, has there been any place where you have gone in for an unusual inventory accumulation, the point of the question being, if you did so, on what did you base your decision to undertake that inventory accumulation?

Mr. GRAHAM. Not to my knowledge. I cannot speak back over the full period of 15 years as to the management decision, but not to my knowledge. We have not deliberately, let us say, embraced a policy of accumulation of inventory.

Representative WIDNALL Has your inventory accumulation lessened to any degree in recent years because of the expediting of delivery on the part of the manufacturer or the increase in warehousing costs?

Mr. GRAHAM. I would say not particularly because of increase in warehousing costs, but I would say because of the availability in delivery of goods, that it has had a tendency to be more stable.

Representative WIDNALL. Does that reflect itself in any——

Mr. GRAHAM. I am again talking about and I would like to make the point clear here, that I am talking about the overall combination, of the inventory and the on-order, which we call "in sight."

Representative WIDNALL. Do you in your evaluation of inventory need, to any major extent, take into account economic indicators that come from outside your own business, such as general economic projections for the future?

Mr. GRAHAM. We try to; yes.

Representative WIDNALL. But basically, probably the major reason for your decision is based on your own experience in sales?

Mr. GRAHAM. That is correct.

Representative WIDNALL. This is not too important, but I think it is a factor. The year before last, we had a very unusual winter, and it materially affected sales in a good part of the United States. Was there anything major done by your own company, reflected by way of inventory accumulation, because of weather?

Mr. GRAHAM. If by "an unusual winter" you are referring to the climatic conditions, which I think you are, I don't think we did anything unusual. At that point, we were in the same situation as everybody. We had the goods bought, it was on the shelf, which is one of the problems of the retailer. At that point not being able to predict the weather with any degree of accuracy, the inventory was there and we had to carry through with it. I do not believe we did anything unusual.

Representative WIDNALL. Did that cause a cancellation of some of your orders, or the deferment of future accumulation?

Mr. GRAHAM. No; I believe at the time this occurs, the position is pretty well committed and either liquidation of the inventory or cancellation of the orders at that point is beyond recoupment.

Representative WIDNALL. If you were in the automobile business at that time and saw them sitting on the lot for 3 months, you didn't buy any more automobiles. This is the point of my inquiry. I think it had a very major effect on inventory accumulation in a number of businesses, and I wonder if this would apply to merchandising establishments such as yourself. It could apply to part of the drop in the community.

Mr. GRAHAM. With regard to automobiles, this could depend on the season, it may have some temporary effect. The automobile will sell come March or April. If the goods were winter mackinaws or rubber boots, the problem is different as the goods will be carried over if the proper weather conditions fail to materialize.

Representative WIDNALL. That is all; thank you.

Chairman PATMAN. Tomorrow morning here in this room, Mr. Reuss will have as his witnesses Prof. John P. Lewis, of Indiana University; Mr. Martin R. Gainsbrugh, of the National Industrial Conference Board; and Mr. Louis J. Paradiso, of the Department of Commerce on the subject of the role of inventories in cyclical reversals.

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Without objection, members of the committee may extend their remarks and the panelists may extend their remarks and elaborate on what they have said by using any material that is germane.

Now, the committee will stand in recess until 10 o'clock tomorrow morning.

(Whereupon, at 11:45 a.m., the subcommittee recessed, to resume Tuesday, July 10, 1962, at 10 a.m.)

INVENTORY FLUCTUATIONS AND ECONOMIC STABILIZATION

TUESDAY JULY 10, 1962

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON ECONOMIC STABILIZATION,
AUTOMATION, AND ENERGY RESOURCES
OF THE JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee of the Joint Economic Committee met, pursuant to recess, at 10 a.m., in room 4200, New Senate Office Building, Hon. Henry S. Reuss, presiding.

Present: Representatives Reuss (presiding), Griffiths, and Senator Pell.

Also present: William Summers Johnson, executive director; John R. Stark, Paul G. Darling, economists; and H. D. Gewehr, research assistant.

Representative REUSS. Good morning.

The continued session of the Subcommittee on Economic Stabilization, Automation, and Energy Resources of the Joint Economic Committee, will come to order.

There is before the subcommittee a statement by Prof. Michael C. Lovell of Yale University and the Cowles Foundation for Research in Economics entitled "The Contribution of Inventory Investments to Cyclical Reversals in Economic Activity." Without objection it is ordered included in the record and appears at the end of the hearings at p. 245.

Yesterday we heard witnesses on the role of inventory changes during expansion and contraction. This morning we have three very distinguished witnesses before us to give us the benefit of their thinking on the role of inventories in cyclical reversals.

The witnesses include Prof. John P. Lewis of Indiana University, Martin R. Gainsbrugh of the National Industrial Conference Board, and Louis J. Paradiso of the Department of Commerce.

All are held in the greatest respect by this committee and have upon numerous occasions in the past given us the benefit of their help and advice, and we are very honored and grateful to have you with us this morning, gentlemen.

As I understand it, all three have submitted written papers. Are they all available this morning, or are there, as I have heard, two available?

I am advised that two are available and that the third will be here in a short while.

They will all be received and made part of the record. If it is agreeable, gentlemen, I would like to ask each of you to proceed in your own way, perhaps to summarize your paper or, if you prefer, to read it. Please present your views in whatever manner you like.

Professor Lewis, would you lead off?

STATEMENT OF JOHN P. LEWIS, CHAIRMAN AND PROFESSOR OF BUSINESS ECONOMICS AND PUBLIC POLICY, INDIANA UNIVERSITY

Mr. LEWIS. Thank you, Mr. Chairman.

I am sure that all members of the panel very much approve of the purposes of this hearing, and we are very happy to participate in them.

It is inevitable, given its general objectives, that the Joint Economic Committee should evince a lively and recurrent interest in the behavior of business inventories, and it is fitting that the committee has added to its collection of outstanding staff papers the four-part study of "Inventory Fluctuations and Economic Stabilization" issued during the past 6 months.

This study, it seems to me, is a major addition to the contemporary literature of applied economic analysis. It has brought together, from many of the economists who have been exploring the frontiers of inventory analysis lately, a copious anthology of what the profession presently has to say about the aggregative behavior of inventories.

From the viewpoint of the Congress, as it turns out, the principal accomplishment of the study is to illuminate some critical economic processes and spotlight some questions that remain unanswered as to the operation of those processes rather than to point clearly and directly to new legislation that is needed to improve the economy's performance. But the study is no less important for this reason. From the viewpoint of the Congress it is a service for staff studies generally to inform the legislative process even when they do not lead to the advocacy of specific pieces of legislation.

Moreover, many Joint Committee staff studies—this one emphatically included—have the important byproduct value of informing the economics profession itself and, therefore—indirectly and with varying lags—a great variety of decision makers, private as well as public.

Thus the holding of these hearings would be timely if their only purpose were to celebrate the issuance of the study on "Inventory Fluctuations and Economic Stabilization." I understand that, in the minds of some committee members, the hearings have been given a certain additional edge of urgency by the rather unexpectedly ambiguous symptoms that general business conditions have been displaying during the past 2 or 3 months.

While I am not sure myself that there is any immediately relevant policy guidance that a study of inventory behavior can supply to our current economic situation, the impulse to make the connection is a natural one, and I am sure that the panel will turn out collectively to have something to say about it.

As you already have remarked, our particular group this morning has been asked to address itself to the question of the role of inventories in cyclical reversals. A useful and extensive discussion of this question has been prepared by Professor Lovell, and I gather that it is to be put in evidence at some later point.

Representative REUSS. If I may interrupt, Dr. Lovell's very valuable contribution will be made part of the record.

Mr. LEWIS. Yes.

In these opening remarks I don't want to try to steal Professor Lovell's thunder except to say that he has commenced his statement

with the same point with which I presume any of the rest of us would have started, had we been doing a similarly extensive piece of drafting.

That point is that changes in business inventories contribute heavily, compared with their average share of the GNP, to fluctuations in general economic activity. Inventory investment is highly volatile, and, in general, it aggravates—it does not offset—fluctuations in end-user demand.

However, to establish that inventory fluctuations contribute importantly to general fluctuations still leaves the question of causation unanswered.

Do the turns in inventory investment occur independently of swings in final demand, then perhaps triggering the latter?

Or do turns originate in other sectors, with inventories playing only a responsive role?

Or is there some kind of systematic interaction between the two, perhaps involving third causes?

I'd like to put my few comments on this matter of causation in a format that I hope may allow me to serve as a kind of nonspecialized professional intermediary between the members of the committee, on the one hand, and such specialists in inventory analysis as Professors Darling, Lovell, Fromm, and Stanback who presently are writing for and testifying before the committee.

If one thinks of a body of economic theory and analysis—in this case the economics of inventory behavior—as a set of ideas that evolves through time, the committee's staff study of "Inventory Fluctuations and Economic Stabilization" is a kind of cross section of the best presently on-going research in the inventory field.

Given such a forum, it is natural and appropriate for the specialists to emphasize their points of disagreement and dwell on the issues that remain most puzzling. Yet in so doing they may inadvertently convince the layman that professional economic opinion is more thoroughly fragmented over the main issues at hand than it actually is.

Such an impression would be particularly unfortunate in the case of inventory behavior, it seems to me, because here is one strand of applied economic analysis whose evolution in this country during the past couple of decades has been quite orderly and traces back, very largely, to one point of theoretical origin—namely, to Lloyd Metzler's 1941 model of the inventory cycle.

Metzler's model, empirically corroborated to some extent by Moses Abramowitz' National Bureau study of manufacturers' inventories in the interwar period, nevertheless was highly abstract and, therefore by definition, was highly unrealistic.

But it represented an illuminating distillation of ideas that is still illuminating. Moreover, if I am not mistaken, virtually all subsequent findings in the inventory field can be viewed as amplifications, modifications, corrections, and complications of this model—in other words, as exercises that have brought the Metzler model into closer correspondence with the real world. Virtually none of the newer findings, including those of our present specialists, have fallen outside this evolutionary format.

Hence I want to recall, very briefly, what the principal characteristics of the Metzler model and its answer to the question of cyclical turning points were, and then sketch the manner in which most of

the newer findings can be viewed as amplifications and refinements of this view.

The Metzler model assumed, in effect, that firms pursue certain cost-minimizing inventory policies that are represented by efforts to maintain certain and/or regain preferred ratios of inventories to sales.

It assumed, reasonably enough, that production takes time and, therefore, lags behind demand. And it assumed—also quite reasonably—that businessmen are imperfect forecasters so that, from time to time, a predominance of the commodity-producing and handling firms in the economy can simultaneously encounter unexpected changes in sales.

Given these assumptions, Metzler showed that the collective attempt of the firms caught in this situation to regain desired inventory-sales ratios could be self-frustrating for the time being as the attempt to replenish or reduce inventories itself induced offsetting changes in sales.

Moreover, the resulting interaction between sales, output, desired inventories, and actual inventories would then tend to induce fluctuations in all of these variables that would be self-reversing, persisting, and more or less rhythmical—as long as (and this seems to me Metzler's crucial and self-conscious abstraction) new external changes, for example, in Government demand or fixed investment, did not intervene.

Such, roughly, is the nature of the so-called rocking-chair structure that Metzler hypothesized—a set of relationships centering around inventory decisionmaking that, once given an initial impulse from outside, could generate repetitive cycles in general business activity.

Depending on its parameters, a model of this sort might theoretically yield constant-magnitude cycles, or progressively more violent, eventually disasterous, ones, or a series of fluctuations that progressively diminished until the mechanism received a new actuating shock from outside. I suppose that intuitively and common-sensically we always have assumed that the inventory-cycle mechanism, to the extent that there actually is such a thing, is of this last, dampened type, where the fluctuations would become diminishing through time until a new outside shock occurred.

Note that the answer that the Metzler model gives to the question of the role of inventories in cyclical reversals is a mixed one—as indeed, it seems to me, has been every sensible answer since. The original actuating impulse came from outside the inventory nexus in the form of an unanticipated change in sales. But then the inventory mechanism did account for subsequent turning points—but only through its interaction with sales and output.

So much for what I am calling the theoretical point of origin of our modern view of inventory behavior.

Now, what amendments, modifications, and qualifications have subsequent study and experience added to this view? Among others, the following:

First, in the postwar economy the cumulative properties of declines in inventory investment, especially on the downside, have not been as great as Metzler seemed to surmise. This has been because of our beneficient, if mostly inadvertent, development of cushioning mechanisms—if you will, of "multiplier-weakening" mechanisms—between GNP and disposable personal income.

As a result, business now comes closer to being able to carry out a cutback in excessive inventories without inducing cutbacks in consumption. The adverse reverberations of inventory cycles have been considerably more moderate than we might have feared.

Second, and most important, we have had plenty of opportunity to observe that inventory fluctuations are not nearly as all-important as a naive adoption of the inventory cycle as one's sole theory of business fluctuations would have suggested.

I don't believe that Lloyd Metzler or any other sensible analyst ever really advocated such single-track theorizing. But, in any event, we have seen time and again that autonomous changes in Government spending, in plant and equipment, in automobiles or housing or what have you can dominate the magnitude and the timing of fluctuations, with inventory investment doing no more, usually, than aggravating the swing.

We have had one instance, during the Korean war, when a whole violent down-cycle in inventory investment was completely disguised, so far as the course of the GNP was concerned, by expansion in other sectors.

And we have had repeated instances where surges in other sectors have come forward, after a peaking in inventory investment, to provide offsets to the latter and keep a prosperity phase going. We have had plenty of evidence that the economy is not committed to the inexorable rhythms of the inventory cycle—or rather, more accurately, that as it actually operates in an interact with the real world, the inventory cycle, while it does exhibit self-reversing properties, has no inexorable rhythms.

Third, much of the better research that has been done specifically on inventories in the past few years has elaborated and clarified the concept of firms inventory objectives, which are represented in the simplest kind of Metzler model, it will be remembered, simply by fixed ratios of desired inventories to sales.

It has been observed that these desired ratios can change gradually over the long run, for example, in response to capital-saving—in this case, to inventory-economizing—innovations, so that over the long term the inventory sales ratio would exhibit some decline.

It has been observed that target ratios also can shift in the short run, sometimes dramatically as after the Korean outbreak, particularly in response to changing supply conditions. This has led to the further observation that what might be called a Metzler sequence—an inventory cycle—can in principle be set in motion as well by a sudden supply-induced change in inventory objectives as by an unexpected change in sales.

If the inventory and sales are in line in terms of the previous objective, you can get one of these things started by the target inventory suddenly shifting upward as much as by sales suddenly accelerating and drawing down actual inventories.

Still under the heading of inventory objectives, it has also been observed that any going set of objectives appears to place a flexible, not a rigid, constraint on inventory decisions.

This point is expressed one way by Ruth Mack, when she talks about sort of passive inventory changes about which business doesn't worry as long as they stay within a certain band, and it is expressed another way by those like Professor Lovell who build so-called variable accelerators into their models.

Either way, the consequence is that in any given period decision makers are unlikely to make as radical moves to redress an unwanted inventory position as the Metzler model would suggest.

Professor Stanback has added still another element to our inventory-objective lore by suggesting that the supply position which firms try to keep in line with sales is composed not only of stocks literally on hand but also of those on order.

Fourth, in this list of factors that have, as it were, amended the Metzler model, the postwar period has witnessed the development and propagation in the business community of improved, more closely calculated techniques of inventory management.

This has been accompanied by the expenditure of much effort to improve firms' ability to forecast sales. To the extent that the latter succeeds it tends, in terms of the Metzler model, to diminish the extent to which, and frequency with which, firms get caught short with unwanted inventory levels.

To the extent that modern inventory management prevails, the same firms are somewhat quicker to detect the emergence of inappropriate inventories and to institute corrective action. They are unlikely, as it were, to swing as wide on the turns.

Fifth, mention already has been made of the impact of supply conditions on inventory objectives. In addition recent studies have taken more explicit account of those occasions, in upswings, when supply shortages may forestall and stretch out efforts to accumulate inventories, thereby damping subsequent inventory swings.

Finally, recent scholarship—mainly in response to forecasting failure that had eventuated from trying to predict changes in inventories solely on the basis of inventory-sales relationships—has amended the Metzler model by taking explicit account of the relationship of new orders and order backlogs to inventories.

What this in fact has entailed, or should entail—some of the enthusiasts have not been explicit—is more careful recognition (1) of the differential behavior of inventories at the different fabrication stages, that is purchase materials, goods in process and finished goods, and (2) more careful recognition of the distinction within manufacturing among (*a*) industries that produce to stock, where the finished goods inventory is the reconciling cushion between demand and output, where new orders and sales are virtually synonymous, and where there is no appreciable order backlog, that is the one possibility; (*b*) at the other extreme industries that produce to order, where new orders lead sales, there is an order backlog, which plays the cushioning function, and there is virtually no finished goods inventory, and (*c*) mixed cases in between these two polar extremes.

There are many facts of the contemporary inventory studies—some of which I haven't read and some, no doubt, that I do not understand—that I have not touched upon in this sketch of the way in which recent experience and research have been modifying and complicating the Metzler model into a more realistic description of the way things work.

Nevertheless, it is my impression that the gist of the profession's present view of the role of inventories at cyclical turning points remains one that does credit the existence of a rocking chair mechanism that would tend, were it left alone, to induce a series of self-reversing fluctuations on general business activity.

But the structure of the chair is by no means fixed. Since World War II it has probably been evolving in the direction of a jerkier more limited, less cumulative kind of rocking.

And at any rate, it is the external blows to the chair—the changes in other demand sectors—that have accounted and will continue to account for the big wobbles in the economy's performance.

I am not sure that we are meant to discuss policy this morning, and in any event I have not left myself time for such comments at this point. My general view, however, is that the concern of the Government, rather than worrying about the limited instability of the inventory mechanism per se should be first, to smooth the external shocks registering in other sectors, including Government expenditures, and, second, to do all it can to maintain and further strengthen those cushioning mechanisms that tend to keep inventory adjustments from inducing cumulative spirals in final sales.

Mr. Chairman, I also have a series of suggestions concerning our inventory data that I should like to get on the record sometime later in the morning, if the other members of the panel do not beat me to it.

Representative REUSS. You certainly will be accorded that opportunity. I want to thank you very much, and to add that this committee is always interested in hearing policy suggestions. If you are refraining from making any such suggestion because of an idea to the contrary, I hope before we adjourn this morning you will divest yourself of whatever substantive suggestion you may have.

Mr. LEWIS. Very good.

Mr. LEWIS. I really refrained because my statement was already too long.

Representative REUSS. Well, you are very modest; you have been most helpful; and we want you to withhold nothing from us.

Our next witness will be Martin R. Gainsbrugh, vice president and chief economist, National Industrial Conference Board.

Will you proceed, Mr. Gainsbrugh.

STATEMENT OF MARTIN R. GAINSBRUGH, VICE PRESIDENT AND CHIEF ECONOMIST, NATIONAL INDUSTRIAL CONFERENCE BOARD, ON INVENTORY FLUCTUATIONS AND ECONOMIC STABILIZATION

Mr. GAINSBRUGH. Thank you, Mr. Chairman.

I took the committee's stipulation literally and have tried to keep my opening statement to the 5-minute limit specified.

In the light of the thinning of the ranks of panel participants, however, I may take the opportunity to interpolate several additional ideas.

The main theme of my opening statement is directed specifically at the attempts that have been made thus far in the material submitted to the committee to demonstrate a clean line of casuality between changes in inventory investment and the business cycle. It is this thesis that I propose to challenge in my opening statement.

I will concede that inventory change has been a major factor in postwar business cycles. I would go a step farther and say that in one or two it may have been a prime factor. But the major point I would stress is that the key importance attaching to inventory investment since World War II in my judgment, was primarily a prod-

uct of the particular economic environment surrounding what I have labeled as the first catch-up postwar decade.

I doubt that a more atypical period of time to study the relationship between inventories and business cycles could have been picked than that particular time span in our history.

In that decade demand for the most part ran ahead of supply. Prices were tilted sharply upward. Purchasing agents were more concerned about being caught short at a time when order books were bulging than they were with tight inventory control. The prospect of rising volume and continuing inflation could safely be counted upon to offset any temporary surplus of product that might arise during a mild, short-lived recession.

It was an easy period for purchasing agents to survive.

As this lush sellers' market faded, purchasing agents became increasingly aware of the improved capacity position of their major sources of supply, here and abroad.

Prices, particularly of primary commodities, softened. Profit margins narrowed and internal controls were tightened in an effort to offset this squeeze.

Excessive inventory accumulation in the shift from a sellers' to a buyers' market was far more the result of purchasing policies necessitated as a hedge against labor disturbances than was the case in the first postwar decade.

Controllers cautioned purchasing agents against diverting resources from other more profitable areas into less profitable investment in inventories. As elasticity of supply expanded, purchasers tended to push the function of holding inventories back to their sources of supply. In a sense they were saying to their sources of supply, "Don't call us, we will call you when we need you."

In viewing the inventory problem against this background I am inclined to believe that the significance of inventories in cyclical reversals has diminished markedly—excepting only the imbalances arising from anticipated or actual labor disturbances. The present recovery, for example, is threatened far more by the sluggish response of the capital goods industries, the continuing attrition in profit margins, and the new uncertainty—this one had never appeared since the end of World War II, at least prior to a recession—the new uncertainty surrounding capital values. These are far greater threats to the continuance of this particular recovery than any excessive overhang of inventories.

The major reservation I have to the conclusions presented in some of the material published by this committee or submitted for publication by this committee, is that the cyclical frame of reference is regarded as identical from World War II to the present.

As I have tried to indicate in my opening remarks here and other publications elsewhere, once we embarked upon the middle years with shortages and inflationary pressures minimized inventories no longer played a key role as they did in the first postwar decade.

Certainly they are a peripheral factor now in the tapering off, if not the turning point, of the current recovery.

Moving on from that opening comment, I would like to comment briefly on a study we have submitted to this committee of the factors that have influenced business decisions relative to inventories. This study demonstrates, particularly on pages 10 and thereafter, that

the primary maladjustments in inventory policy in more recent recessions have stemmed from the inability of business enterprises to forecast correctly and from other factors such as labor conflicts over which they have no control.

I would like, at this point to read one of the conclusions relative to this, page 4:

> About five-eighths of the reported causes of inventory maladjustments were some variant of unexpected decline in sales while about a fifth were rooted in labor conflicts.

This is not idle theorizing: these are statements that have come to us from the largest corporations in the country as to the factors that led to maladjustments of inventories within their own enterprises "Experience in Inventory Management," in "Inventory Fluctuations and Economic Stabilization"—Part IV.

> If one may reasonably add inadequate inventory controls, inadequate production controls, sales exceed forecasts, and sales increased to unexpected sales declines, then about three-fourths of the total causes of inventory maladjustments were rooted in economic changes to which companies could not readily adjust.

In addition to better forecasts, better knowledge of existing stocks would undoubtedly contribute toward further improvement in inventory policy. Speaking as a business economist, I would congratulate the Department of Commerce upon the progress it has made in speeding up its monthly reports on inventory as well as the foreshadowing statistics they are now publishing relative to inventory expectations, and much other new material.

But going beyond that, we need now far more reliable information than we have had in the past, on inventory statistics at the commodity level. In earlier testimony before the committee I have said that in this day and age of electronic data processing we ought to be able to do better than derive steel inventories on an imputed basis.

The Department of Commerce has just published new data based on steel inventories derived from census reports. I hope they go beyond steel to other metals and key commodities.

At the aggregate level it would also be helpful to have estimates of inventory stock in current and constant prices as compared with the book value aggregates we now have.

In closing, I would commend the Joint Committee for the interest it is manifesting in the inventory area.

Discussions of the type that are going on this week not only add to the fund of knowledge, they also perform another valuable function. They help to sharpen industry's interest in the contributions that better inventory control can make not only in improving the profit position of the individual enterprise but in contributing toward greater economic stability of business in general.

As our report indicates, considerable progress has already been made in industry in terms of the development of more sophisticated inventory control. There is room for much more.

In fact, more is in store as a result of the continuing interest of this committee in this important sector of investment.

Thank you.

Representative REUSS. Thank you, Mr. Gainsbrugh.

We will now hear from Louis J. Paradiso, Department of Commerce.

Mr. Paradiso.

STATEMENT OF LOUIS J. PARADISO, ASSISTANT DIRECTOR-CHIEF STATISICIAN, OFFICE OF BUSINESS ECONOMICS

Mr. PARADISO. Thank you, Mr. Chairman.

Mr. Chairman and members of the committee, I have a rather brief statement here which I would like to read.

I also have attached to this statement nine charts which I hope will add to the elaboration of the various points I shall make, and each chart is backed up by the corresponding table so that the numbers are available for that particular chart.

I shall confine my observations to a particular aspect of inventories, namely, the role which inventory investment has played in the four postwar business cycles. The conclusions suggested below are based mostly on simple comparisons of group aggregates and changes involving inventories, sales, new orders, unfilled orders and their ratios to inventories.

Also, more involved techniques such as correlations using these variables have been examined. In evaluating the role of inventories, it is most essential that a balanced view be taken and all major contributing factors should be carefully weighed as to their relative importance in affecting the turning points as well as the amplitude of the inventory swings.

I should like to emphasize that the stated conclusions cannot be regarded as "proved." Shifts in inventory investment are the resultant of a host of factors, some are measurable and others cannot be quantified. Much needs yet to be done to improve and extend both the data and analytical techniques.

With these preliminary cautionary remarks in mind, I shall address myself to the following propositions.

Supporting charts and tables are appended.

(1) On the basis of analyses of the relevant factors covering the postwar period, it does not appear that business inventory swings have been the initiating influences in triggering or causing the postwar reversals in business activity.

Rather, inventories seem to have fluctuated in response to other phenomena. Inventory investment has been a factor in all business declines but not necessarily an initiating one.

Indeed, changes in aggregate inventory investment have more often tended to coincide or follow shifts in final purchases.

In periods of reversals, fluctuations in general business activity as measured by the real GNP, have been characterized by weakening or strengthening of final purchases; i.e., demands other than for inventory investment. Sometimes consumer demands have been dominant, sometimes demand for plant and equipment and at times shifts in Government purchases, or a combination of these demands.

This is evident from charts 1–4 which show quarterly changes in major demand groups over the four postwar cycles. I regard these first four charts as so important in terms of analyzing the inventory movements in relation to other factors of the economy that I would just like to take a minute, Mr. Chairman, to show you these charts in colored form.

These are reproduced in black and white in the attached tables. But essentially, what these charts indicate are the changes in real GNP for each of the four postwar cycles.

For example, this one, the 1953–1954 cycle, quarterly changes in real terms, which means we are measuring physical quantities of changes in total production. Over the period, the chart shows quarterly changes in GNP and its components.

This is a complete breakdown of the total production first into what the change in inventory investment has been corresponding to the change in GNP, and the change in the final sales corresponding to the change in GNP.

The sum of these two represents the total change in the GNP.

And then I have taken the change in final sales and broken those down into the major components of the change in final sales, namely, the change in real personal consumption expenditures, what we as consumers buy; the change in new construction expenditures, the change in producers durable equipment purchases, the change in our net exports of goods and services, and finally the change in the Government purchases of goods and services.

Now, you see, these charts portray the various contributions of the major elements of purchases and production to the GNP, and in my judgment this is by far the most enlightening way to examine just what has happened to the inventory change, both with respect to its initiating effect, if there is any, and secondly, with respect to its amplitude.

Now (2), once the downturn of the cycle has been underway, shifts in inventory investment have tended to aggravate the extent of the decline in GNP since production can fall below final sales for a time.

Representative REUSS. Mr. Paradiso, before you get on to (2), I want to be sure I understand the impact of your chart on No. 1.

Would you restate the conclusion which you draw from the materials encompassed by the chart you have just been describing?

Mr. PARADISO. Yes.

If we examine these charts in terms of real changes, we examine the points where weaknesses began to develop or where parts of these elements of sales began to strengthen, we don't find at any point that the inventories have been the initiating factor.

Let me illustrate, say, in one case or I will take any other case.

Let's take the 1953–1954 cycle. In this cycle, you will notice that the recession began in the second quarter of 1953, in other words, the top was the second quarter 1953, and we began a decline in real GNP in the third quarter, and the decline was accentuated in the fourth quarter and in the first and second quarters the decline continued and then the recovery began in the third quarter of 1954.

Now, the question is what caused—breaking down the GNP into the parts, what caused—this particular wave here, this particular decline through the 1953–1954 period.

Well, you can see what happened to inventories. The inventories changed; sure, there was a drop here, inventories increased somewhat in the second quarter, then the inventories declined during the same period when total business declined.

But notice final sales declined at the same time. Actually, the change in final sales began to have a diminishing effect in this quarter here, in the second quarter.

What about those final sales what parts of the final sales were actually——

Mr. GAINSBRUGH. Louis, before you leave that, don't your charts show inventories reach their peak rate of accumulation nearly a year before the cyclical reference trough?

Mr. PARADISO. Yes, but there are other factors we must consider along with the inventory change. This was a period of the steel strike right here and the steel strike caused a liquidation of inventories, followed by a subsequent accumulation.

So we have here, I think, many factors operating which caused these changes in inventories in addition to the, not only the, physical factors but also psychological factors and others.

Mr. LEWIS. Could I ask a clarifying question here?

Mr. PARADISO. Yes.

Mr. LEWIS. Your inventory figures here, are they changes in inventory investment or changes in inventory?

Mr. PARADISO. They are changes in inventory investment.

In other words, they are the contributions to the changes in real GNP.

Mr. LEWIS. Yes.

So these don't show inventory investment as such.

Mr. PARADISO. These don't show inventory investment as such. However, if you are interested in inventory investments as such, I have the corresponding charts here which show precisely what the inventory investment has been in relation to these same figures.

In other words, these are changes, and this chart here, Mr. Chairman, the bottom chart, shows the actual changes in inventories themselves.

You see this is a change in the change, we are getting changes in the investment because in order to make them comparable to the changes in GNP we must consider the change in the inventory change to compare it with the change in production involved.

Mr. LEWIS. This would show that inventory investment which has been referred to in some of the materials, did peak in the fourth quarter of 1952, didn't it?

Mr. PARADISO. It peaked in the fourth quarter of 1952.

Mr. LEWIS. Before the downturn?

Mr. PARADISO. Yes.

Mr. LEWIS. These are not inconsistent.

Mr. PARADISO. Yes, but other things peaked in that quarter.

Net exports, for example, showed a decline way back here, the Government showed a decline here. Producers durable equipment also declined early.

In other words, what I want to demonstrate here is that each of these cycles, I just picked this at random, the picture is not at all uniform with respect to the way the inventories have moved during a recession, before the recession and after the recession and other components of demand have sometimes shown earlier declines than inventories.

Sometimes the declines have been on a concurrent basis. So I don't think we can conclude, Mr. Chairman, from an examination of this detail—and by the way I have this in even more detail with respect to particular commodities such as the personal consumption expenditures, I have that shown here in some of my charts broken down as to durable goods and nondurable goods, to show just which to show just which of these two sectors move—we cannot conclude

from an examination of these four charts that the inventory swings have been initiating factors in either a downswing or an upturn.

Representative REUSS. Would you please proceed?

Mr. PARADISO. Two, as I indicated, once the downturn does proceed, however, then the inventory investment makes a very substantial contribution to the total change in our output, and I have a small table which shows this kind of a contribution made over the four postwar cycles. I don't know as I have to read this. It is fairly clear as to the terms of the contribution of inventory investment to a change in GNP both the downswing and upswing.

(The table referred to follows:)

Contribution of inventory investment to real GNP in the postwar cycles

[Billions of 1954 dollars, seasonally adjusted annual rate]

Quarterly average change in the downswing			Quarterly average change for 1st 4 quarters of upswing		
Period	GNP	Inventory investment	Period	GNP	Inventory investment
1949, 1st quarter–1949, 2d quarter	−3.5	−5.0	1950, 1st quarter–1950, 4th quarter	+9.6	+5.4
1953, 3d quarter–1954, 2d quarter	−3.4	−1.5	1954, 3d quarter–1955, 2d quarter	+7.5	+2.4
1957, 4th quarter–1958, 1st quarter	−9.0	−3.5	1958, 2d quarter–1959, 1st quarter	+7.3	+2.7
1960, 3d quarter–1961, 1st quarter	−3.4	−2.7	1961, 2d quarter–1962, 1st quarter	+8.8	+2.3

Mr. PARADISO. I think the interesting thing about this table is we also have the amount of inventory pickup in the upswing of the GNP, and what is clear from the table is that inventory investment plays a much smaller role in the upswing of the cycle. This may be due in part to the actual physical inability to accumulate the required stocks and in part to cautiousness on the part of producers in building up stocks until the character of the upswing becomes more definitive. Also, they appear to be conservative in forecasting the extent of the recovery.

Mr. Chairman, we had some evidence of that from a survey which we conducted in the manufacturing area where businessmen tell us what they expect their sales to be as well as their future inventory level.

(3) The problem of wide inventory swings centers primarily in the sharp fluctuations in stocks of durable goods manufacturers and in the inventory movements of new passenger cars held by automobile dealers. These have dominated the changes in total business inventories. Elsewhere inventory changes have been moderate and usually closely geared to fluctuations in sales, and I think chart 5 in this respect is a rather significant one, because it pinpoints the area of inventory swing.

The two areas as I have indicated are retail auto stocks and durable goods manufacturing inventories.

The turning points of inventories held by durable goods manufacturers have apparently been in response to and have followed from 3 to 6 months' reversals in sales and in the changes in unfilled orders of these producers, and charts 6 and 7 demonstrate this lag which is involved between the inventory change and sales and unfilled orders.

A multiple correlation analysis for the postwar period relating quarterly changes in factory durable goods inventories and, by the way, this analysis is somewhat more sophisticated than merely relating inventories to sales and new orders, we worked many of these correlations; in this case relating inventories of durable goods firms to sales, changes in unfilled orders in the previous quarter, and this is a lag effect, and the inventory level at the end of the second preceding quarter, again a lag, shows a fair degree of association of inventories with these factors.

The variance explained, the amount explained of the total fluctuation involved, the variance explained is about 70 percent of the total variance, leaving nearly 30 percent to be explained by other factors, and in fact, I regard this 30 percent as exceedingly significant because the other factors have been at times important in determining inventory investment.

Chart 8, by the way, indicates the actual inventories compared with the ones calculated from the formula based on these factors I just listed.

Automobile stocks are predominantly a function of sales of automobiles, although other influences are also important such as competition and sales position.

Here the consumer propensity to buy has been a dominant factor, and this has often been influenced by more favorable financing terms and changes in tastes.

Also, the auto inventory-sales ratios have tended to rise due to the necessity to carry larger number of makes and models with the advent of the compact cars.

(4) Significant accelerations or retardations of governmental programs, particularly those associated with national defense activity, have produced major shifts in inventory requirements. Increased defense ordering is followed by large accumulations of purchased materials stocks.

By the way, on one of the charts which I have here the indication is that the increase in purchase material stocks happens 6 months, sometimes 9 months or even a year after the orders are placed.

In other words, there is a very considerable lag involved here.

Conversely, downward adjustments in defense programs affect inventory holdings of companies involved.

For example, in early 1957 defense ordering was reduced to trim subsequent expenditures. Inventory reductions in durable goods industries was the response. When ordering in 1957 was stepped up, durable goods firms increased purchased materials inventories.

I don't think there is any question about the effect of a shift in defense ordering upon the intentions of business to increase purchased material stocks or to alter them in accordance with changes in defense.

Representative REUSS. Mr. Paradiso, you said when ordering in 1957 was stepped up.

Mr. PARADISO. Yes.

Representative REUSS. Did you not mean 1958?

Mr. PARADISO. Ordering in early 1958 was stepped up. I am sorry. I misread it.

Representative REUSS. It was 1958?

Mr. PARADISO. 1958. I misread it, early 1957 ordering was reduced and then after sputnik we had the stepping up of orders in 1958.

5. Anticipations of labor disputes or threats of strikes in major industries have always sparked abnormal inventory accumulations by firms which might be affected; the aftermath has been severe and sometimes prolonged adjustments in stocks.

For example, the prolonged 1959 steel strike was preceded by large inventory accumulations by steel consumers. The subsequent inventory liquidations followed by the rebuilding of steel stocks had a most disturbing effect which materially affected the course of the economy in 1960.

Earlier this year, steel consumers accumulated large inventories because of the uncertainties of the outcome of the labor-management negotiations in the steel industry.

With early settlement of wage contracts, the process is being reversed and steel consumption is now significantly higher than receipts.

A survey initiated earlier this year by the Bureau of the Census, Department of Commerce, shows that during the first 4 months of this year manufacturing steel consumers increased their inventories of steel mill products by 3 million tons, during a period when consumption was little changed.

In May they reduced steel inventories by 400,000 tons even though consumption in May was up. The census survey results show that steel producers increased their finished steel product inventories by 500,000 tons in the same 4 months, and reduced such stocks by the same amount in May. Steel producers have also cut their work-in-process inventories by a half million tons during May in reflection of reduced orders from consumers.

And I might add there, Mr. Chairman, that the steel liquidation in May was relatively small in terms of total accumulation and that there is an expectation of further liquidations in the months ahead in this sector.

6. While fluctuations in inventory investment are largely a function of lagged changes in sales and orders, it cannot be inferred that significant deviations from the theoretical values given by the linear relation in certain periods were due to conscious decisions by business firms to overstock or liquidate by abnormal amounts—except in the the exceptional cases of strike threats.

Rather, business firms for the most part have not been able to gage accurately their inventory needs or their sales and have at times found themselves with unbalanced stocks relative to sales.

Thus, only to a limited degree has inventory investment been generally under the control of business firms. This is suggested by surveys recently conducted by the Office of Business Economics of the Department of Commerce covering a representative sample of manufacturing firms.

In these surveys, the typical experience has been for inventory anticipations for the 6-month period ahead to deviate significantly from the actual inventory changes later realized.

Excessive inventory accumulations or liquidations have occurred from time to time partly in reflection of sales expectations which did not materialize and partly due to the inability of firms to control the flow of deliveries against prior orders placed with suppliers. The OBE adjusts the reported data based on historical patterns with the result that the corrected data prove to be fairly reliable.

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7. However, there is some evidence, although incomplete, and covering only a relatively short period, that more recently business firms have made some progress in controlling and limiting inventory investment.

Evidence of this progress is available from various sources: First, chart 4 shows the 1961–62 cycle, given at the end of the table. This chart shows that changes in inventory investment in the past year has been quite moderate in relation to the sizable increase in real GNP.

Second, more recently, particularly over the past year, inventory-sales ratios in manufacturing durable goods industries have been drifting downward in total and by stages of fabrication.

For purchased materials, the ratios are currently at postwar lows. This is shown in the last chart of the series, chart 9.

Even for purchased materials inventories of nondurable manufacturing, the ratios to sales are at the postwar lows. This seems to suggest that for certain types of inventories, particularly those over which management has direct control, a very conservative policy has been pursued in recent quarters. The tendency has been to trim high costs of holding stocks.

Also, there is some evidence suggesting that inventory policy of purchasers has shifted toward putting the burden of holding stocks on suppliers, particularly in view of adequate supplies and of speedy delivery performance.

In the June 25, 1962, issue of Purchasing Week, a McGraw-Hill publication, the lead article is "Big Vendors Turn to Local Service Distribution, Latest Pitch Is: We'll Carry Your Inventory if You Buy Our Goods."

Third, an important new factor in inventory control is the use of electronic computers and other modern equipment to provide up-to-minute information on the status of inventory holdings and flows.

Better control is thus achieved and inventory flows can be more closely geared to actual production requirements and sales.

Again, Purchasing Week illustrates this in an article in the April 9, 1962, issue on "How Westinghouse Cuts Costs by Unifying Raw Materials and Finished Goods Inventories. Automated Conveyers and Stackers Spot Loads at Computers' Direction. Electronic Memory Keeps Tabs on 10,000 Items in 22,000 Locations." We do not now know how widely this development has spread, and I hope, Mr. Chairman, some time in the future we will be able to make some survey to see the extent of this particular practice of industry.

Finally, relatively stable prices in the recent period together with readily available supplies are in the direction of improving the prospects for minimizing inventory swings.

Increased investment in fixed capital resulting in increased capacities to produce also contribute to conservative inventory policies.

In summary: Available evidence suggests that inventory investment has not been the initiating factor in the four postwar business cycles.

However, inventory movements have significantly affected the amplitude of the cycle, particularly in the downswing phase.

Fluctuations in stocks held by durable goods manufacturers and by retail automobile dealers are mostly responsible for the wide swings in business inventories.

In the recent period, producers have achieved some success in controlling inventories by the use of more efficient techniques.

Thank you.

(The tables and charts referred to follow:)

TABLE 1.—*Breakdown of changes in real GNP in 1948–49 cycle change from preceding quarter, seasonally adjusted at annual rate*

[Billions of 1954 dollars]

	Gross national product	Business inventory change	Final sales	Personal consumption expenditures	New construction	Producers' durable equipment	Net exports of goods and services	Government purchases of goods and services
1947—2d quarter	2.0	−1.1	3.1	3.6	−0.1	0.1	0.2	−0.5
3d quarter	2.5	−2.0	4.5	.8	1.9	0	.1	1.7
4th quarter	4.3	4.5	−.2	.1	2.1	.5	−2.6	−.4
1948—1st quarter	−.8	.7	−1.5	1.1	−.3	.7	−3.3	.3
2d quarter	6.9	2.2	4.7	.9	1.1	−.2	−1.2	4.1
3d quarter	2.3	.9	1.4	.4	−.1	−.1	−.3	1.5
4th quarter	1.7	−1.7	3.4	1.2	−.8	.8	.5	1.8
1949—1st quarter	−5.8	−4.5	−1.2	−.7	−.9	−2.3	1.5	1.0
2d quarter	−1.2	−5.6	4.3	3.7	.1	−.6	0	1.1
3d quarter	5.3	4.0	1.3	1.2	1.1	−1.1	−.6	.8
4th quarter	−2.6	−4.0	1.5	4.2	1.4	−.8	−1.9	−1.4
1950—1st quarter	9.7	8.7	.9	1.7	1.4	−.3	.2	−2.2
2d quarter	9.3	2.7	6.6	3.5	2.0	2.9	−.5	−1.1
3d quarter	13.6	−.2	13.8	11.4	1.0	1.9	−1.3	.7
4th quarter	6.0	10.3	−4.3	−8.6	−.3	−.2	.7	4.1
1951—1st quarter	2.4	−5.5	7.9	5.3	−.4	−1.3	0	4.2

Source: U.S. Department of Commerce, Office of Business Economics.

TABLE 2.—*Breakdown of changes in real GNP in 1953–54 cycle change from preceding quarter, seasonally adjusted at annual rate*

[Billions of 1954 dollars]

	Gross national product	Business inventory change	Final sales	Personal consumption expenditures	New construction	Producers' durable equipment	Net exports of goods and services	Government purchases of goods and services
1952—1st quarter	2.7	0.1	2.6	0.2	0.4	0.3	−0.1	1.8
2d quarter	−.3	−7.3	7.0	2.7	.1	.4	−.7	4.3
3d quarter	3.3	6.5	−3.1	1.1	−.1	−2.9	−3.0	1.8
4th quarter	9.7	1.1	8.5	6.4	.8	1.8	−.9	.5
1953—1st quarter	6.6	−2.3	9.0	3.8	.6	1.3	.3	3.0
2d quarter	4.3	.6	3.6	2.2	.5	−.9	−.3	2.1
3d quarter	−3.0	−2.5	−.6	−.2	0	.4	−.1	−.7
4th quarter	−6.3	−5.3	−.9	−1.9	.2	−.4	.7	.5
1954—1st quarter	−3.5	2.1	−5.6	−.7	.1	−.7	.4	−4.8
2d quarter	−.9	−.4	−.6	3.0	1.0	−.6	1.0	−4.9
3d quarter	2.6	.9	1.8	2.6	1.3	−.2	−.3	−1.6
4th quarter	8.0	2.8	5.1	4.2	1.3	−.8	1.8	−1.4
1955—1st quarter	12.1	3.9	8.3	5.5	2.0	.4	−.9	1.2
2d quarter	7.3	1.8	5.5	5.0	.5	1.4	−1.1	−.3
3d quarter	8.0	−.5	8.5	6.2	.2	2.0	.8	−.5
4th quarter	3.6	1.1	2.5	1.9	−.5	.7	−.5	.9

Source: U.S. Department of Commerce, Office of Business Economics.

TABLE 3.—*Breakdown of changes in real GNP in 1957–58 cycle change from preceding quarter, seasonally adjusted at annual rate*

[Billions of 1954 dollars]

	Gross national product	Business inventory change	Final sales	Personal consumption expenditures	New construction	Producers' durable equipment	Net exports of goods and services	Government purchases of goods and services
1956—1st quarter	−2.3	−1.3	−1.0	1.4	−1.0	−0.1	0.2	−1.7
2d quarter	.1	−1.7	1.8	.5	−.1	.4	1.3	−.3
3d quarter	1.3	−.2	1.4	−.3	−.3	.5	.9	.6
4th quarter	5.3	.1	5.3	3.5	−.5	.3	.7	1.4
1957—1st quarter	4.1	−1.5	5.6	2.0	.1	−.1	1.2	2.3
2d quarter	.4	.3	.1	1.5	−.2	−.6	−.8	.2
3d quarter	1.0	−.5	1.5	3.0	0	.1	−.4	−1.2
4th quarter	−7.2	−3.3	−3.9	−1.3	−.1	−1.3	−1.6	.6
1958—1st quarter	−10.8	−3.6	−7.2	−3.2	−.6	−3.2	−1.8	1.6
2d quarter	2.2	1.2	1.0	2.0	−.8	−1.3	−.6	1.6
3d quarter	7.7	2.1	5.6	3.5	.4	−.3	.4	1.6
4th quarter	10.7	4.4	6.2	4.3	1.5	.7	−1.3	1.0

Source: U.S. Department of Commerce, Office of Business Economics.

TABLE 4.—*Breakdown of changes in real GNP in 1960–61 cycle change from preceding quarter, seasonally adjusted at annual rate*

[Billions of 1954 dollars]

	Gross national product	Business inventory change	Final sales	Personal consumption expenditures	New construction	Producers' durable equipment	Net exports of goods and services	Government purchases of goods and services
1959—1st quarter	8.5	3.1	5.6	5.1	1.6	0.6	−1.1	−0.5
2d quarter	12.3	3.9	8.3	5.9	1.5	1.5	−1.0	.3
3d quarter	−7.8	−9.3	1.5	1.1	−.5	.1	1.3	−.5
4th quarter	4.1	4.2	−.2	2.0	−1.3	.2	1.0	−2.1
1960—1st quarter	10.3	4.9	5.5	2.6	.9	.5	1.5	0
2d quarter	2.4	−5.0	7.4	4.1	−.4	1.0	.4	2.2
3d quarter	−3.2	−2.6	−.6	−.9	−.3	−.7	.6	.7
4th quarter	−1.8	−3.4	1.6	1.0	.3	−.6	1.9	−1.0
1961—1st quarter	−5.2	−2.1	−3.0	−2.6	−1.0	−2.2	−.2	3.0
2d quarter	12.3	6.1	6.1	4.6	1.2	.4	−1.4	1.4
3d quarter	6.3	1.0	5.3	3.4	1.0	1.1	−1.3	1.0
4th quarter	12.8	.8	12.0	5.8	.5	1.7	1.4	2.6
1962—1st quarter	3.6	1.4	2.2	2.0	−1.4	.3	−.7	2.0

Source: U.S. Department of Commerce, Office of Business Economics

TABLE 5.—*Total business sales and inventories*

[Billions of dollars, seasonally adjusted]

	Inventories, end of quarter			Sales
	Durable manufacturing	Retail autos	Excluding durable manufacturing and retail autos	Excluding durable manufacturing and retail autos
1948:				
1st quarter	14.39	1.63	35.97	26.61
2d quarter	14.69	1.72	36.87	27.09
3d quarter	15.35	1.65	37.90	27.22
4th quarter	15.74	1.99	37.84	26.87
1949:				
1st quarter	16.15	2.22	37.06	26.12
2d quarter	15.35	2.05	36.28	25.70
3d quarter	14.47	2.73	36.01	25.36
4th quarter	13.97	1.88	36.07	25.65
1950:				
1st quarter	14.13	1.78	36.81	26.11
2d quarter	14.57	2.10	37.82	27.43
3d quarter	15.12	2.05	40.18	31.02
4th quarter	16.78	2.46	43.66	30.36
1951:				
1st quarter	18.10	2.79	47.28	32.93
2d quarter	20.08	2.98	48.78	31.73
3d quarter	21.84	2.99	48.16	31.53
4th quarter	22.81	3.13	47.64	31.85
1952:				
1st quarter	23.76	2.97	47.45	31.84
2d quarter	23.70	2.77	46.58	32.17
3d quarter	23.65	2.74	46.94	32.75
4th quarter	24.41	3.03	47.39	33.50
1953:				
1st quarter	24.97	3.07	47.62	33.11
2d quarter	25.88	3.21	48.22	33.39
3d quarter	26.49	3.52	48.49	33.58
4th quarter	26.24	3.28	47.86	32.77
1954:				
1st quarter	25.48	3.21	47.81	32.92
2d quarter	24.41	3.20	47.78	33.32
3d quarter	23.74	3.21	47.23	33.44
4th quarter	24.08	3.01	47.20	34.15
1955:				
1st quarter	24.20	3.35	47.93	34.90
2d quarter	24.43	3.62	48.52	35.80
3d quarter	25.38	3.66	49.13	36.27
4th quarter	26.66	4.01	49.90	36.96
1956:				
1st quarter	27.87	3.93	51.10	37.21
2d quarter	28.76	3.68	52.51	37.79
3d quarter	29.45	3.60	53.52	38.01
4th quarter	30.66	3.75	54.27	38.84
1957:				
1st quarter	31.18	3.97	54.70	39.26
2d quarter	31.44	4.09	54.86	39.04
3d quarter	31.82	4.64	54.96	39.34
4th quarter	31.15	4.64	55.01	38.31
1958:				
1st quarter	29.86	4.25	54.33	37.46
2d quarter	28.53	3.88	53.77	38.07
3d quarter	28.05	3.68	53.43	39.22
4th quarter	27.82	4.14	53.50	40.08
1959:				
1st quarter	28.92	4.15	53.74	40.97
2d quarter	30.23	4.54	54.90	42.47
3d quarter	29.82	4.42	55.51	42.65
4th quarter	30.08	4.32	56.20	42.64
1960:				
1st quarter	31.77	4.82	57.01	42.94
2d quarter	32.23	4.96	57.58	43.64
3d quarter	31.84	5.02	57.76	42.98
4th quarter	30.86	5.27	58.00	42.77
1961:				
1st quarter	30.30	4.37	57.99	43.07
2d quarter	30.20	4.44	58.45	43.67
3d quarter	31.10	4.38	58.78	43.95
4th quarter	31.47	4.69	59.38	44.96
1962: 1st quarter	32.41	4.54	60.11	45.24

Source: U.S. Department of Commerce, Office of Business Economics.

TABLE 6.—*Durable goods manufacturers' sales and inventories*

[Billions of dollars, seasonally adjusted]

	Sales, monthly average	Inventories, end of quarter		Sales, monthly average	Inventories, end of quarter
1948—1st quarter	7.38	14.39	1955—2d quarter	12.94	24.43
2d quarter	7.38	14.69	3d quarter	13.44	25.38
3d quarter	7.67	15.35	4th quarter	13.65	26.66
4th quarter	7.95	15.74	1956—1st quarter	13.64	27.87
1949—1st quarter	7.48	16.15	2d quarter	13.63	28.76
2d quarter	7.14	15.35	3d quarter	13.40	29.45
3d quarter	7.15	14.47	4th quarter	14.40	30.66
4th quarter	6.48	13.97	1957—1st quarter	14.65	31.18
1950—1st quarter	7.26	14.13	2d quarter	14.25	31.44
2d quarter	8.36	14.57	3d quarter	14.33	31.82
3d quarter	9.66	15.12	4th quarter	13.52	31.15
4th quarter	9.98	16.78	1958—1st quarter	12.12	29.86
1951—1st quarter	10.41	18.10	2d quarter	11.75	28.53
2d quarter	10.51	20.08	3d quarter	12.46	28.05
3d quarter	10.16	21.84	4th quarter	13.28	27.82
4th quarter	10.42	22.81	1959—1st quarter	13.94	28.92
1952—1st quarter	10.49	23.76	2d quarter	15.48	30.23
2d quarter	10.46	23.70	3d quarter	14.50	29.82
3d quarter	10.64	23.65	4th quarter	14.18	30.08
4th quarter	12.07	24.41	1960—1st quarter	15.43	31.77
1953—1st quarter	12.53	24.97	2d quarter	14.98	32.23
2d quarter	12.64	25.88	3d quarter	14.52	31.84
3d quarter	12.75	26.49	4th quarter	13.84	30.86
4th quarter	11.62	26.24	1961—1st quarter	13.40	30.30
1954—1st quarter	11.38	25.48	2d quarter	14.46	30.20
2d quarter	11.19	24.41	3d quarter	14.92	31.10
3d quarter	11.18	23.74	4th quarter	15.52	31.47
4th quarter	11.18	24.08	1962—1st quarter	15.93	32.41
1955—1st quarter	12.31	24.20			

Source: U.S. Department of Commerce, Office of Business Economics.

TABLE 7.—*Durable goods manufacturers—changes in inventories and unfilled orders*

[Billions of dollars, seasonally adjusted]

	Change in inventories	Change in unfilled orders		Change in inventories	Change in unfilled orders
1948—1st quarter	0.09	−0.48	1955—2d quarter	0.23	0.69
2d quarter	.31	.58	3d quarter	.95	3.10
3d quarter	.65	−.26	4th quarter	1.29	4.11
4th quarter	.39	−1.38	1956—1st quarter	1.20	1.69
1949—1st quarter	.41	−2.47	2d quarter	.89	2.34
2d quarter	−.80	−2.80	3d quarter	.69	4.28
3d quarter	−.88	−1.92	4th quarter	1.21	1.42
4th quarter	−.50	1.38	1957—1st quarter	.52	−1.82
1950—1st quarter	.16	1.28	2d quarter	.25	−2.16
2d quarter	.44	2.65	3d quarter	.38	−4.32
3d quarter	.56	8.76	4th quarter	−.67	−4.66
4th quarter	1.66	5.10	1958—1st quarter	−1.28	−3.47
1951—1st quarter	1.32	12.82	2d quarter	−1.34	−.76
2d quarter	1.98	7.38	3d quarter	−.48	.18
3d quarter	1.77	3.83	4th quarter	−.23	.93
4th quarter	.96	3.41	1959—1st quarter	1.11	2.33
1952—1st quarter	.95	2.94	2d quarter	1.30	.72
2d quarter	−.06	3.45	3d quarter	−.41	.71
3d quarter	−.05	3.04	4th quarter	.27	1.05
4th quarter	.76	−.74	1960—1st quarter	1.68	−2.66
1953—1st quarter	.56	−.42	2d quarter	.46	−1.46
2d quarter	.91	−2.03	3d quarter	−.39	−.70
3d quarter	.61	−6.97	4th quarter	−.98	−.96
4th quarter	−.25	−6.89	1961—1st quarter	−.56	−.13
1954—1st quarter	−.76	−5.67	2d quarter	−.10	.69
2d quarter	−1.08	−4.86	3d quarter	.90	1.61
3d quarter	−.67	−2.51	4th quarter	.37	1.86
4th quarter	.35	.20	1962—1st quarter	.94	.85
1955—1st quarter	.11	1.52			

Source: U.S. Department of Commerce, Office of Business Economics.

TABLE 8.—*Inventory changes of durable goods manufacturers compared to calculated changes* [1]

[Billions of dollars, seasonally adjusted]

	Actual	Calculated	Deviation of actual from calculated		Actual	Calculated	Deviation of actual from calculated
1948—1st quarter	0.09	0.14	−0.05	1955—1st quarter	0.11	0.17	−0.06
2d quarter	.31	.26	.04	2d quarter	.23	.66	−.43
3d quarter	.65	.26	.39	3d quarter	.95	.75	.20
4th quarter	.39	.22	.17	4th quarter	1.29	1.18	.11
1949—1st quarter	.41	.08	.33	1956—1st quarter	1.20	1.23	−.03
2d quarter	−.80	−.26	−.54	2d quarter	.89	.76	.13
3d quarter	−.88	−.47	−.41	3d quarter	.69	.66	.03
4th quarter	−.50	−.25	−.25	4th quarter	1.21	.69	.52
1950—1st quarter	.16	0	.15	1957—1st quarter	.52	.59	−.06
2d quarter	.44	.37	.07	2d quarter	.25	.11	.14
3d quarter	.56	.88	−.32	3d quarter	.38	−.14	.52
4th quarter	1.66	1.98	−.32	4th quarter	−.67	−.40	−.27
1951—1st quarter	1.32	1.57	−.25	1958—1st quarter	−1.28	−.77	−.52
2d quarter	1.98	2.40	−.42	2d quarter	−1.34	−1.00	−.33
3d quarter	1.77	1.60	.17	3d quarter	−.48	−.62	.14
4th quarter	.96	.78	.18	4th quarter	−.23	−.08	−.15
1952—1st quarter	.95	.57	.39	1959—1st quarter	1.11	.35	.76
2d quarter	−.06	.40	−.45	2d quarter	1.30	.77	.53
3d quarter	−.05	.31	−.36	3d quarter	−.41	.94	−1.35
4th quarter	.76	.33	.43	4th quarter	.27	.43	−.16
1953—1st quarter	.56	.37	.19	1960—1st quarter	1.68	.42	1.27
2d quarter	.91	.45	.45	2d quarter	.46	.36	.10
3d quarter	.61	.22	.39	3d quarter	−.39	.11	−.50
4th quarter	−.25	−.46	.21	4th quarter	−.98	−.02	−.96
1954—1st quarter	−.76	−.92	.16	1961—1st quarter	−.56	−.22	−.34
2d quarter	−1.08	−.82	−.26	2d quarter	−.10	−.13	.03
3d quarter	−.67	−.68	.01	3d quarter	.90	.40	.50
4th quarter	.35	−.25	.60	4th quarter	.37	.68	−.31
				1962—1st quarter	.94	.78	.16
				2d quarter	----------	.75	----------

[1] Calculated changes from the regression of inventory changes on sales for the previous quarter, change in unfilled orders for the previous quarter, and inventories 2 quarters before, using quarterly seasonally adjusted data, in billions of dollars.

$$\Delta I_t = -0.245 + 0.119\,\Delta U_{t-1} + 0.335\,S_{t-1} - 0.142\,I_{t-2} \quad (R^2 = 0.72)$$

Source: U.S. Department of Commerce, Office of Business Economics.

TABLE 9.—*Ratio of manufacturers' inventories by stage of fabrication to sales—Average inventories for the quarter to average sales for the quarter*

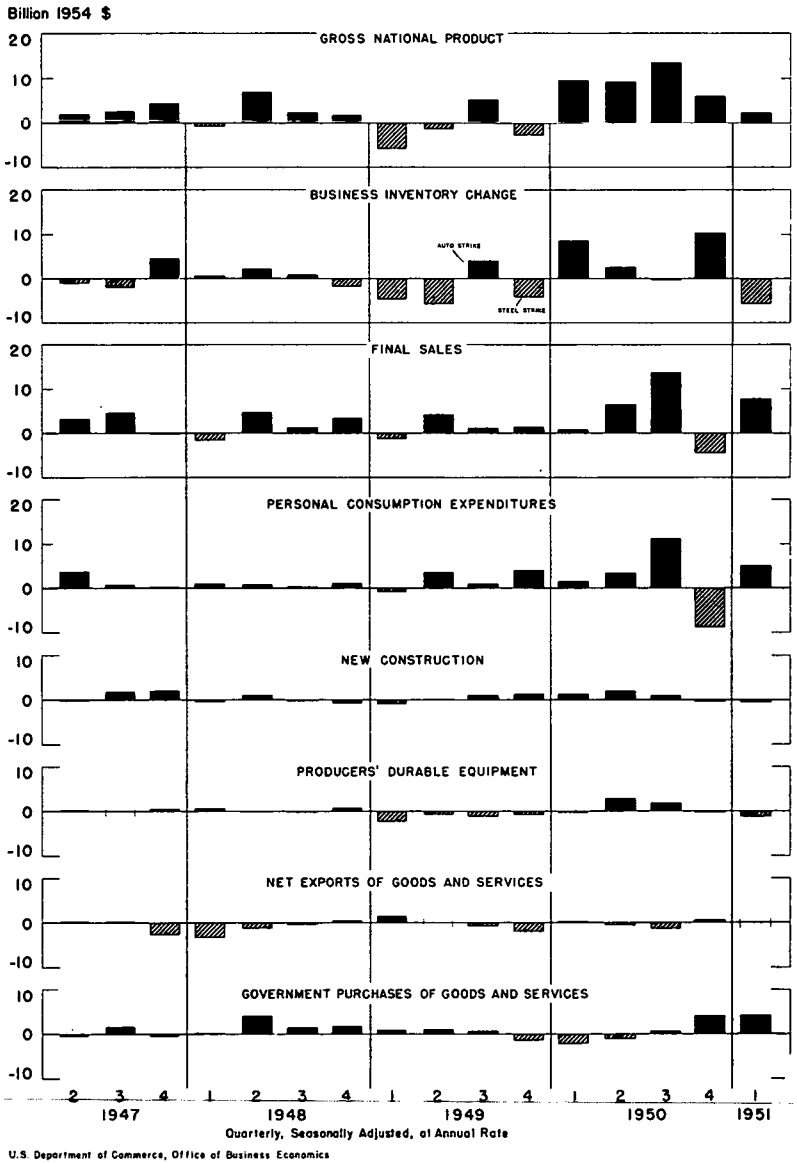
	Durable goods			Nondurable goods		
	Purchased materials	Goods in process	Finished goods	Purchased materials	Goods in process	Finished goods
1948—1st quarter	0.70	0.69	0.55	0.72	0.22	0.55
2d quarter	.71	.69	.57	.73	.22	.56
3d quarter	.72	.68	.56	.74	.22	.60
4th quarter	.70	.68	.58	.74	.23	.65
1949—1st quarter	.77	.72	.66	.74	.23	.70
2d quarter	.76	.74	.71	.72	.23	.71
3d quarter	.70	.70	.69	.70	.23	.69
4th quarter	.71	.73	.73	.70	.23	.68
1950—1st quarter	.64	.65	.64	.69	.23	.68
2d quarter	.57	.59	.55	.65	.22	.65
3d quarter	.53	.54	.46	.60	.21	.55
4th quarter	.57	.57	.46	.69	.22	.57
1951—1st quarter	.60	.62	.46	.73	.21	.55
2d quarter	.63	.67	.51	.81	.22	.60
3d quarter	.70	.75	.62	.80	.22	.68
4th quarter	.70	.79	.65	.77	.23	.70
1952—1st quarter	.72	.85	.66	.77	.24	.71
2d quarter	.71	.91	.66	.76	.23	.70
3d quarter	.67	.90	.64	.73	.22	.70
4th quarter	.60	.82	.57	.69	.23	.67
1953—1st quarter	.58	.82	.56	.70	.23	.67
2d quarter	.59	.85	.57	.69	.23	.66
3d quarter	.61	.86	.59	.68	.23	.68
4th quarter	.66	.92	.69	.69	.23	.71
1954—1st quarter	.64	.92	.71	.67	.22	.70
2d quarter	.64	.89	.70	.65	.22	.70
3d quarter	.62	.85	.67	.65	.21	.69
4th quarter	.60	.87	.68	.63	.21	.68
1955—1st quarter	.54	.80	.63	.61	21	.66
2d quarter	.51	.76	.60	.60	.20	.65
3d quarter	.51	.76	.58	.60	.21	.64
4th quarter	.54	.79	.59	.60	.21	.65
1956—1st quarter	.56	.83	.61	.60	.20	.66
2d quarter	.59	.87	.62	.59	.20	.68
3d quarter	.61	.91	.65	.61	.21	.71
4th quarter	.59	.88	.63	.60	.21	.70
1957—1st quarter	.59	.88	.63	.59	.20	.70
2d quarter	.60	.94	.67	.62	.21	.74
3d quarter	.59	.94	.68	.63	.21	.73
4th quarter	.63	.97	.73	.64	.22	.76
1958—1st quarter	.68	1.01	.82	.65	.22	.77
2d quarter	.67	.99	.82	.65	.22	.76
3d quarter	.60	.91	.76	.62	.21	.70
4th quarter	.57	.85	.68	.60	.21	.69
1959—1st quarter	.56	.82	.65	.59	.21	.67
2d quarter	.55	.76	.61	.58	.20	.65
3d quarter	.60	.82	.66	.58	.20	.64
4th quarter	.58	.84	.67	.58	.20	.66
1960—1st quarter	.56	.80	.65	.57	.19	.66
2d quarter	.59	.85	.71	.57	.19	.66
3d quarter	.59	.87	.75	.57	.20	.68
4th quarter	.59	.88	.79	.57	.20	.71
1961—1st quarter	.60	.90	.79	.56	.20	.71
2d quarter	.54	.82	.73	.55	.20	.69
3d quarter	.52	.82	.71	.55	.20	.67
4d quarter	.52	.81	.69	.54	.20	.67
1962—1st quarter	.52	.80	.68	.55	.20	.67

Source: U.S. Department of Commerce, Office of Business Economics.

CHART 1

BREAKDOWN OF CHANGES IN REAL GNP IN 1948-49 CYCLE

Change From Preceding Quarter, Seasonally Adjusted



U.S. Department of Commerce, Office of Business Economics

CHART 2

BREAKDOWN OF CHANGES IN REAL GNP IN 1953-54 CYCLE

Change From Preceding Quarter, Seasonally Adjusted

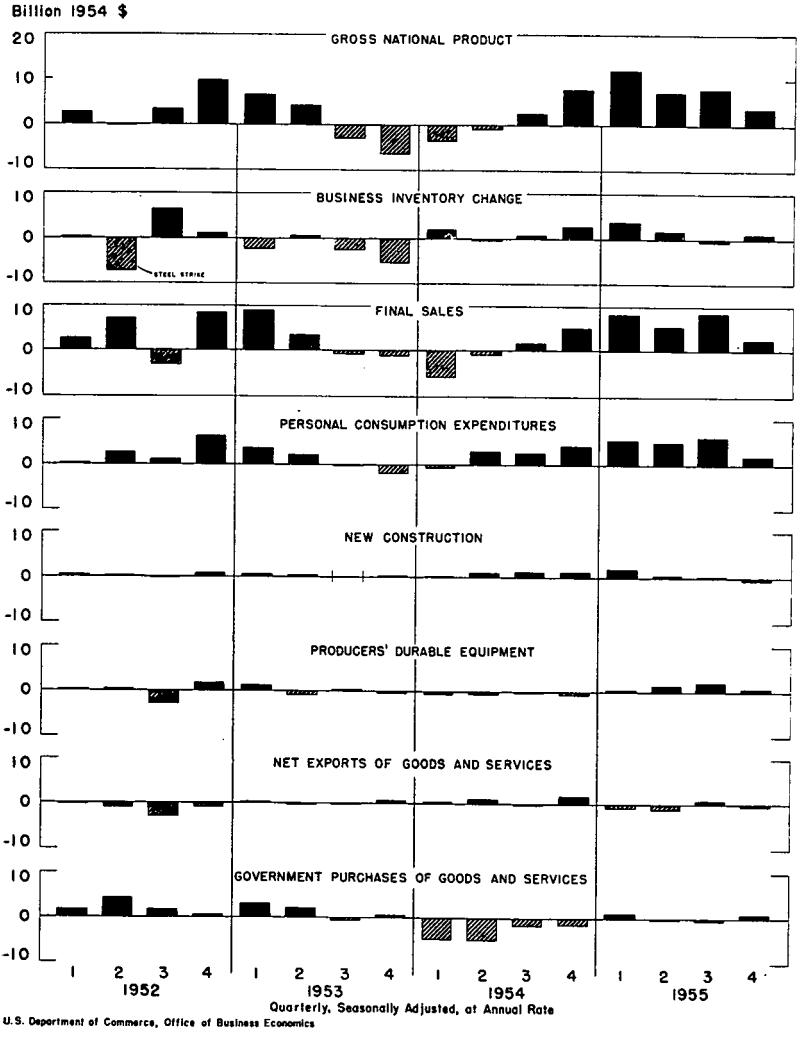


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CHART 8

BREAKDOWN OF CHANGES IN REAL GNP IN 1957-58 CYCLE

Change From Preceding Quarter, Seasonally Adjusted

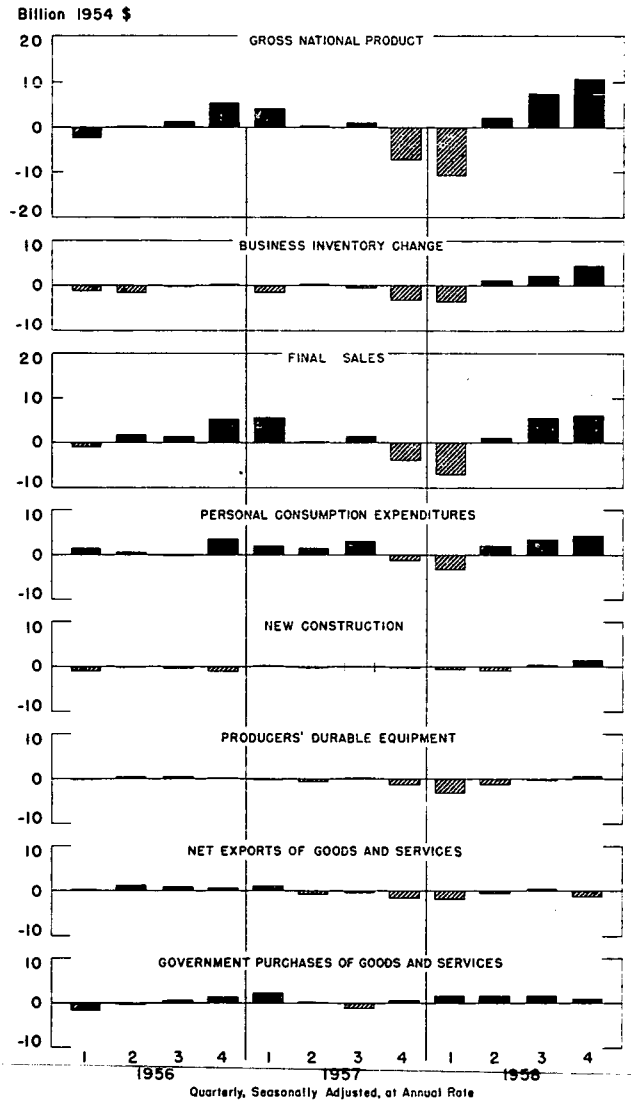

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CHART 4

BREAKDOWN OF CHANGES IN REAL GNP IN 1960-61 CYCLE

Change From Preceding Quarter, Seasonally Adjusted

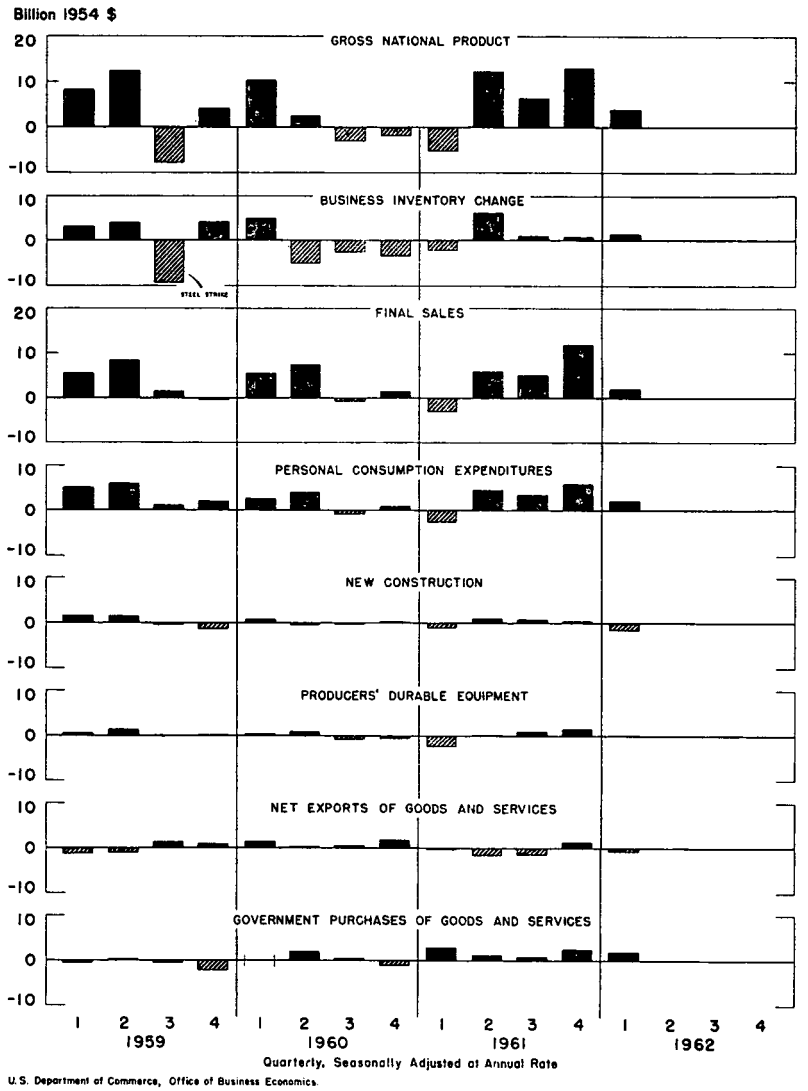

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CHART 5

WIDE INVENTORY SWINGS DOMINATED BY DURABLE GOODS

Other Business Inventories Move With Sales

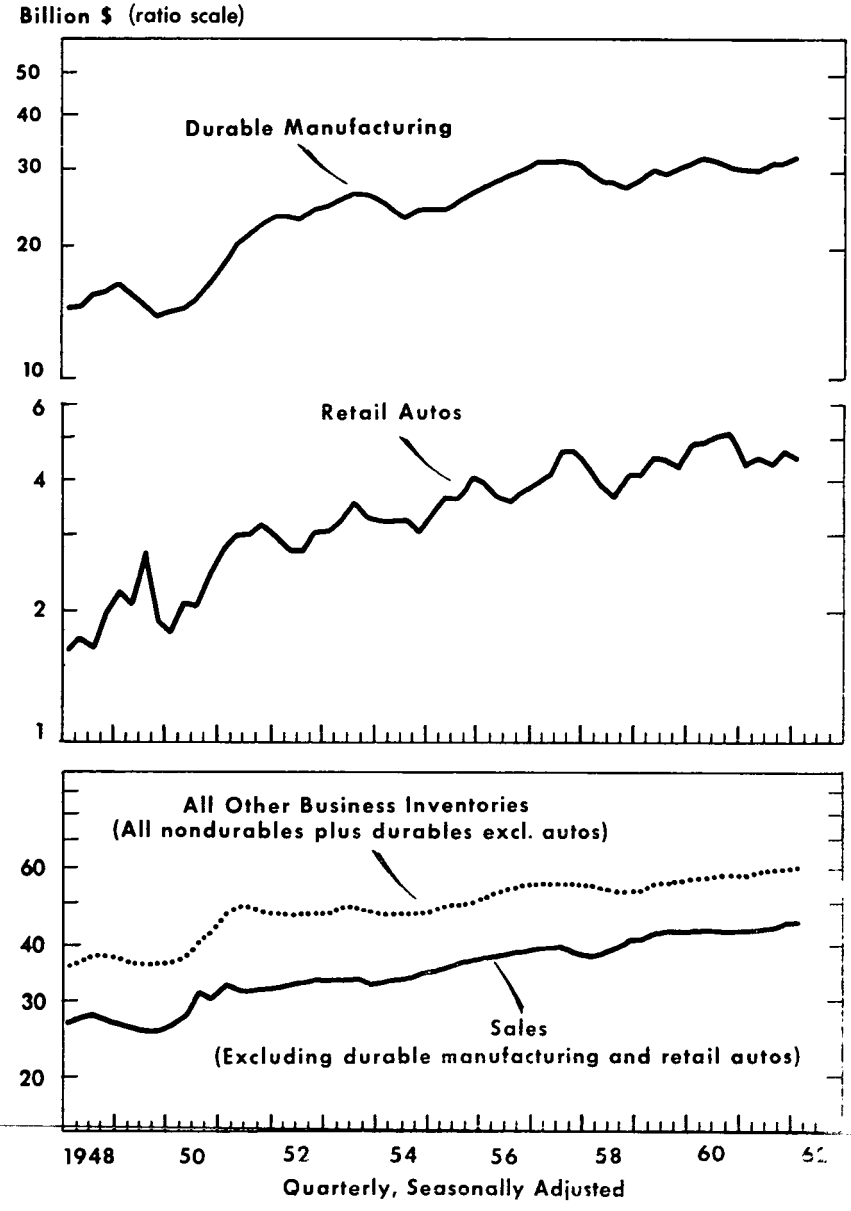

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CHART 6

DURABLE GOODS MANUFACTURERS'— SALES AND INVENTORIES

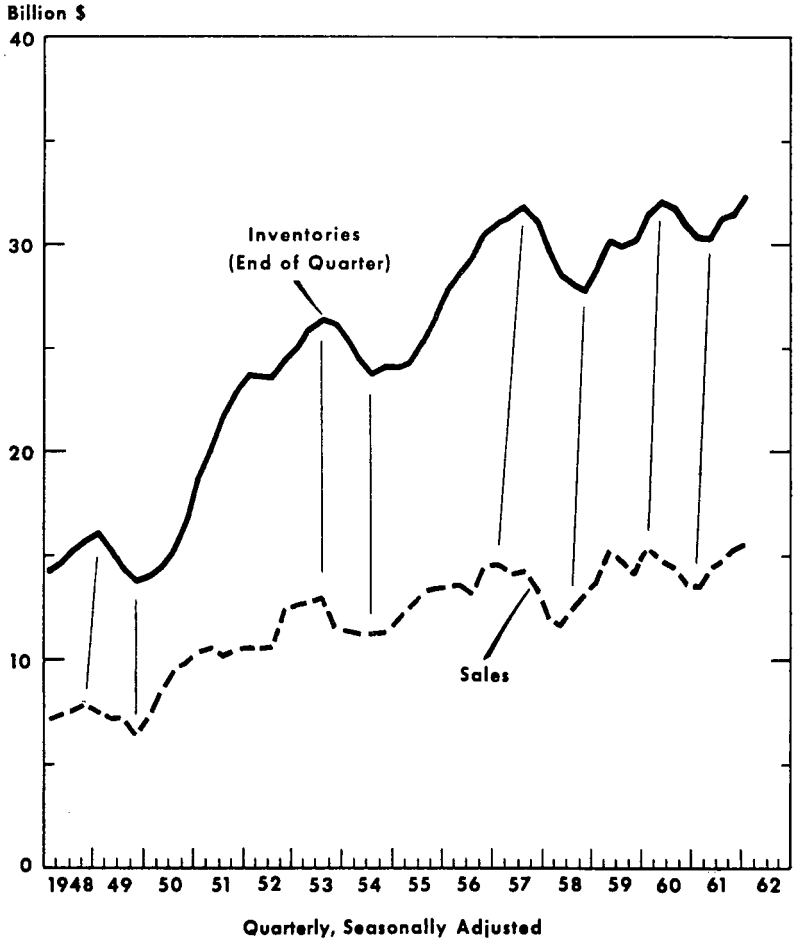

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CHART 7

DURABLE MANUFACTURERS - INVENTORIES AND ORDERS

Turning Points in Inventory Follow Reversals in Change in Unfilled Orders

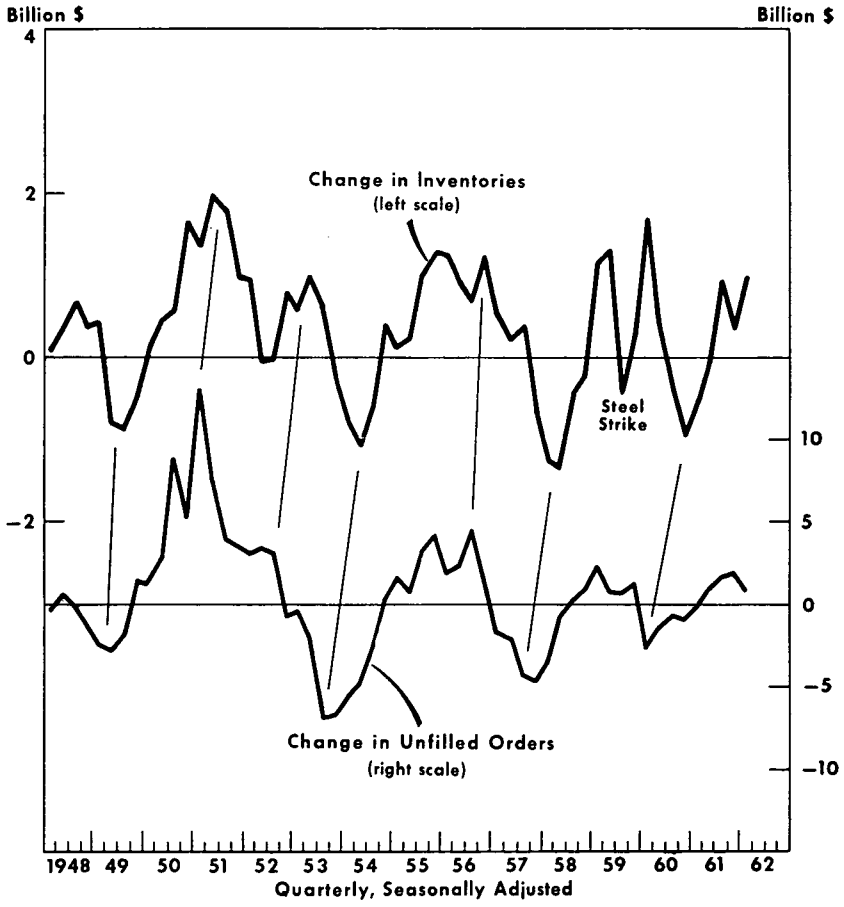

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CHART 8

RELATIONSHIP ANALYSIS:
Inventory Change—Durable Goods Manufacturers

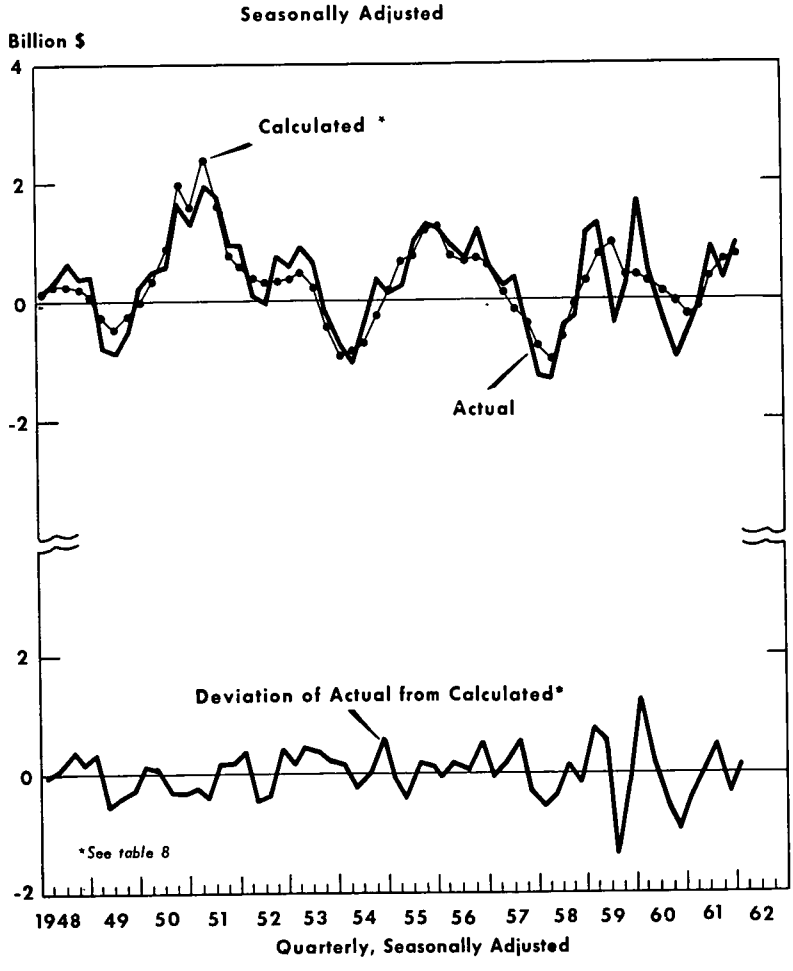

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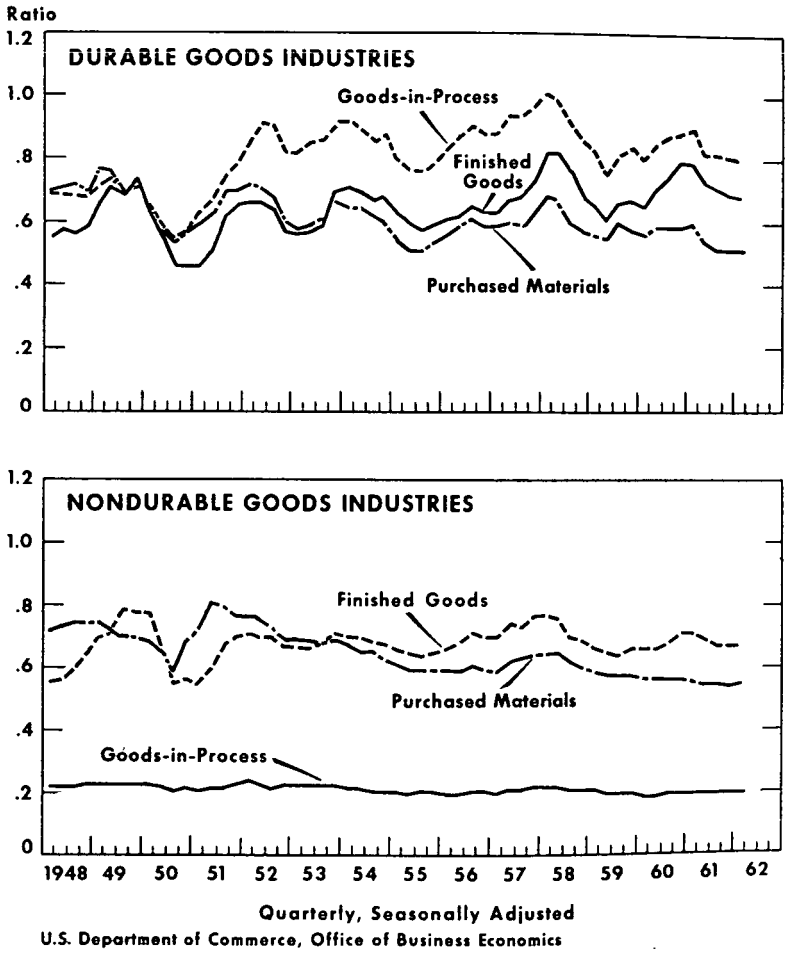
CHART 9

MANUFACTURERS' INVENTORY—SALES RATIOS

Recent Trend Has Been Drifting Downward



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Representative REUSS. Thank you, Mr. Paradiso.

It seems to me that you gentlemen are not terribly far apart in your conclusions which I would try in a rough hewn sort of way to summarize by saying that none of you blames inventory investment in any very important sense for initiating the rock in the rocking chair. I like your metaphor, Professor Lewis, but all of you believe that inventory movements do accentuate the rock once it has been initiated by other factors, principally capital investment, consumer spending, and defense spending, you believe that accentuating the rock is not a good thing for the economy—that the less the rock is accentuated the better. This is a point stressed particularly by Mr. Paradiso, who says that the biggest accentuator of the rock in the rocking chair is in the field of durable goods.

I invite anyone of you to disagree with this formulation, please.

Mr. GAINSBRUGH. May I pose a question that is beginning to trouble me——

Representative REUSS. Yes.

Mr. GAINSBRUGH (continuing). In the light of your summary and the statements by my two colleagues. You have used the phrase "accentuate" and I think my two colleagues have used the word "aggravate" in describing the relationship of inventory accumulation to the business cycle.

I wonder in this connection if the process of inventory accumulation may not have made a contribution toward the shortness of our business recessions particularly to the short duration of our business recessions since the end of World War II, and their mild character in this sense: Companies, once they have discovered the market isn't as strong as they may have anticipated could conceivably cut back immediately. In so doing, they would lay off employees and contribute thereby to a reduction in income and consumption expenditures. Conversely, they could continue to produce with some degree of confidence in the market in the future, playing for the longer term rather than the short run. The slow rather than intense correction still clears the market and contributes toward a milder contraction than might otherwise arise.

Does the process of inventory accumulation necessarily lead to accentuation or aggravation of the contraction?

Mr. PARADISO. Is it a contracting of the recession or a broadening of the recovery?

Mr. GAINSBRUGH. I am looking at it from the point of view of the contraction. Inventories have risen faster than demand. As a result they reach an undesirable total. The company recognizes the need for inventory correction. It could proceed in two ways.

One is to cut production markedly, keep production to a minimum until the overhang of inventories has cleared the market.

The other way is to hope that through more intensive selling, et cetera, it can clear the market at some future period of time; meanwhile, it cuts back on production somewhat but makes a contribution toward the limitation of the contraction by keeping its people employed or more of them employed than it would if they cut back sharply. I believe that this has been the studied policy on the part of the automobile industry, among others.

Mr. PARADISO. I just want to say, I think inventory movements essentially are of rather short duration. As was pointed out in one

of the earlier papers, inventory changes do not contribute to secular growth. They are essentially of very short duration and pretty much self-corrective.

They influence the cycle for a period, there is no question about that. But basically, I think, Martin, what has happened is you have to get away from the inventory and you have got to get to the plant and equipment; and the plant and equipment programs of business are of much longer term, and have much more basic influence on employment and it seems to me if you examine these charts in the light of that, you will find that the inventory fluctuations have had a diminishing effect since 1947–48 and in fact, the worst recession we had in the postwar period, 1957–58, had the smallest amount of inventory change.

We can refer to chart 3 on that and you can see the rather——

Mr. GAINSBRUGH. I am not quarreling with your conclusions.

What I am trying to do is sharpen up the analysis of the role of inventories in the downward phase of a business cycle.

Mr. LEWIS. I would like to make a comment on that.

I think really it sounded as though we were at odds with ourselves, and we are not quite clear at different points what our standard of comparison is.

When Louis looks at the charts and says that inventory investment has contributed considerably to downswings there is no argument with this. It has been one of the components to downswing.

But when we say this we are, in a sense, comparing what happened with what would have happened if there had not been any inventory investment at all. Suppose there were no inventories—in a sense things theoretically might be more stable.

But what we have all been saying is that implicitly inventories perform a very necessary function in the economy. You have got to have them as long as production takes time and as long as people don't forecast perfectly, especially when people want to get goods when they ask for them, goods which have taken a long time to produce and distribute.

Inventories, then, perform a very useful function, but in doing so they have a certain inherently unstabilizing quality to them. We have been saying in the postwar period, actually, given what might have been our preconception about how unstabilizing they might have been, they have been doing very well on a number of counts, including the one Martin has just mentioned—namely, that businessmen have been more moderate in making their adjustments to changes in demand than they might have been.

We have been saying on other counts as well that inventories have been really performing quite well, and that therefore we shouldn't get very excited about them and we shouldn't pick on them as a stabilization problem.

Mr. PARADISO. I agree.

Mr. GAINSBRUGH. This was an extended footnote.

Representative REUSS. Now that harmony has been established, let me ask my question.

Although you three gentlemen agree that inventories are not a No. 1 villain in the business cycle, nevertheless we are left, and I think without dispute, with the point made primarily by Mr. Paradiso, that fluctuations in stocks held by durable goods manufacturers seem

to bear the greatest responsibility for the swings in business inventories. I think your figure was about 70 percent of the total.

Mr. PARADISO. Yes.

Representative REUSS. I would like to ask a question, but first a foreword.

The House has just passed a Trade Expansion Act, the Senate will shortly act on it and, I hope, approve it.

One of the great possibilities which I foresee in an expanded U.S. world trade policy—and I am reinforced by some observations I made in Western Europe last week—is that there may be a great new oversea market for American-made durable goods, particularly for consumers durable goods. In Western Europe there is a very ebullient consumer market. Labor has been getting wage increases and is demanding further increases; management is willing to meet some of these wage demands in order to retain and to attract labor in a full employment situation; and government is worried about the inflationary potential of these wage increases because at full employment, it will be difficult to supply the rising demand.

If this is so, the suggestion is that the Western European market for American-made refrigerators, washing machines, dishwashers, and other consumer durables as well as capital equipment, producer durables, is quite expansible. It could lead to the development of a whole new market in the next years for American goods, which may, to some extent, be what the doctor ordered for what is wrong with our economy.

I will now ask my question. If this should turn out to be so, if American manufacturers of durable goods were suddenly granted the benefits of a large new market, mainly in Europe, would not the increasing size of this market, in addition to the other good things which it does for the American economy, help out in the area of inventory fluctuations where presently fluctuations cause the most damage on the downside?

In other words, if the market is greater and more varied, won't manufacturers engage in smaller inventory liquidations on the downside? Will this not help us to avoid the extremes of cyclical swings which we are now having?

Will somebody address himself to that because we are concerned with policy.

Mr. LEWIS. I think maybe we all have the same reaction, I think, Congressman, your question is making an implicit assumption which is that the European market is not only uncoordinated cyclically speaking, with ours but somehow has a sort of contracyclical pattern vis-a-vis the United States.

That is, if fluctuations in European demand were synchronized with those in the United States then with an expanding market I suppose you would aggravate the inventory fluctuation although it would still be a fine thing to expand the market.

But I myself would not have much confidence that when things were going a little soft here that European demand would come along to an incremental bolster at the right time.

Representative REUSS. You would not have much confidence.

Mr. LEWIS. I wouldn't have much confidence in that. It might be but it would seem to me it would be pretty strange.

Representative REUSS. It is true right now, isn't it? It has been true for the last couple of years. Things have been booming there, and things have not been booming here.

Mr. PARADISO. Wouldn't the tendency be to actually, perhaps, even accentuate the amount of inventory accumulations?

Let's think of it this way. At the present manufacturers—I assume you are speaking of consumer durable other than autos.

Representative REUSS. That is right, because I don't think we are going to sell vast quantities of automobiles in Western Europe.

Mr. PARADISO. Presently manufacturers have a way of building up stocks and then they sell, they find they don't sell enough, they have to liquidate, so there is this wave in this particular area of ups and downs.

Now, suppose you superimpose on this domestic demand a foreign demand? I don't see why the nature of the fluctuations would differ any more except perhaps on an even larger scale under this condition because you are not going to be sure of a steady demand.

Foreign consumers are going to behave the way we do; they buy for inventories and then hold off—I am sorry, buy refrigerators and so on and then hold off until those wear out and have to be replaced. I assume what you are saying is there would be a constantly growing market here. So that this might partake more of the kind of demand which we had.

Mr. GAINSBRUGH. In the United States in the first postwar decade.

Mr. PARADISO. Right.

This kind. In that case I grant that the inventories may rise, but the question is with regard to the stability of that rise. I am not sure this will cause greater stability and it might cause some greater instability.

Mr. LEWIS. It would be nice if you could make it run like a surplus disposal program so the Europeans only got theirs when the demand was slackening up here, but it would be very hard to market under those conditions.

Mr. GAINSBRUGH. I would take off where Louis Paradiso finished.

Western Europe is still in what might be called the catchup phase. They are entering their era of electrification, of gadgetification of the home. Their markets for consumer durables are far from saturated.

I think in good part, the fact they have been experiencing an even milder type of postwar business recessing than we have had is that their catchup stage, postwar, is different from ours.

Now, as they move down the road toward saturation, they may begin to encounter the same durable goods business cycle that we have. In that event, if we accentuate the participation or weight of consumer durable goods production in the American economy we might conceivably accentuate the downswings of the cycle.

Currently the inventory disturbances in the durable goods sector are partially offset by the more stable service and soft-goods industries.

If we enlarge the durable goods sector to take care of the foreign market, in a period of contraction we might get greater rather than shorter or milder swings.

Representative REUSS. Well, I, perhaps, didn't state my point in broad enough terms. Let me try it again.

With your talk about an Atlantic partnership, and while some of it is rhetoric, I take it that included in the concept should be the notion of

some cosmic look at who buys what on both sides of the Atlantic. If you do that, you find that by and large this country at present income levels is about 90 percent saturated on the conventional consumer durables that we are talking about, dishwashers, washing machines, dryers, et cetera, whereas the ebullient countries of Western Europe are only about 10 or 15 percent saturated.

Now, if you are going to have a so-called Atlantic partnership certainly the Common Market and the other countries of Europe are going to have to lower their absurdly high present tariffs on consumer durables which now range from 20 to 30 percent or more ad valorem.

I would think that any planning of the Atlantic partnership, so called, would involve some educated guess as to what should happen in the next 5 or 10 years. And in the next 5 or 10 years, I should think we could agree that it would be a good thing if the pentup demand of European workers for consumer durables, for example, could be in large part satisfied from this country since it doesn't look as if, at full employment, it can be very readily satisfied at home in Western Europe.

By a combination of exploiting the potential export market, and sensible reductions in European tariffs on imports of consumer durable goods, I should think you might have smaller inventory fluctuations in consumer durable goods in this country than would be the case if we just kissed off the European market and staggered along with our own more volatile market.

Therefore, if there is a proper combination of public and private planning here, I should think that we could iron out what seems to be the most aggravating component in the inventory fluctuation cycle.

Mr. Paradiso says "no" with his head. Why not?

Mr. PARADISO. I am sorry, Mr. Chairman, I just don't see it that clearly.

I can see even more difficulties. After all, we have a competitive system here.

These firms of ours are going to compete for that foreign market. Consequently, some firms will have to have large inventories to meet particular sales abroad, but if those sales don't materialize or for some reason his competitor has got the goods, this firm would be left with a lot of inventory on hand.

In other words, in enlarging the market in the durable goods area unless you have some kind of a control by the companies themselves, inevitably, I believe it will result in a multiplication of the situation we have here in the domestic market.

Representative REUSS. Is that so? I would have thought that the larger the market, the less need relatively for inventories.

Mr. PARADISO. I don't think this would be true in goods which are postponable. I think for some goods, such as food, which are not postponable, and you enlarge the market you will get more stability; but for postponable goods, there is more competition, they can be held for years and consequently I think you get into a situation of substantial volatile inventory changes.

Mr. LEWIS. I think this question of the relation between the needed level of inventories and the size of the market is quite complex.

For instance, if you had much more U.S. sales of durables to Europe you would have a lot more inventory in transit transatlanticaly. When you got all through, whether the needed level of inventories

would be relatively higher or lower would depend on a multitude of factors.

But my own general hunch is that there isn't much economy of scale here so far as that goes.

I think the only place I drop off the line with your argument is when you come to the inventories. It would be excellent to increase our sales of durables to Europe. Any market, whether a large and integrated one or smaller one, requires inventories, and as long as you have the type of decentralized decisionmaking we have, you are going to have some of these fluctuations in inventories because of, really basically because of, the time it takes to produce and our inability to predict exactly what is going to happen, especially with consumers calling the tune as to what they want.

In fact, you even have inventory problems, I understand, in the Soviet Union although they don't happen to express themselves in the same forms as our do. They don't result in unemployment but in unwanted production.

Representative REUSS. Thank you.

Mr. GAINSBRUGH. May I make a comment?

Representative REUSS. Yes.

Mr. GAINSBRUGH. If we can get inside that huge market and have it set aside for us on the basis of the theory of international comparative advantages, I would say the net gain from the enlargement of the market would be far greater than the hazards of inventory fluctuations that would arise therefrom.

So netwise, I endorse your commentary to the hilt. I hasten to add this footnote: The Common Market countries are just as interested in getting a higher proportion of their economy into the high-value-added industries as are we. The would be very reluctant on any thesis to say to us "You take the high-value-added industries and we will sweat it out with the textile industries, the service industries, and the primary or extractive industries while we reserve for you the high-value-added industries."

Over the years many of my former students at New York University who have moved up into key economic posts in Western Europe, the Far East, and elsewhere. Occasionally they return to this country for a visit. In my discussions with them of planning process that goes on increasingly in the various countries, I find they are acutely aware of our relatively high-income position and of the relationship of the high-value-added industries to that high-income position. What they plan particularly in the Far East and the Middle East, is to shift their people and resources away from the primary and the secondary industries with low value added to the very types of products which we are still exporting in volume to the rest of the world.

Representative REUSS. Thank you.

Mrs. Griffiths?

Representative GRIFFITHS. I would like to ask you if you can divorce anticipated decreased prices of inventories to a fabricator as distinguished from anticipated reduced sales of the fabricated item?

Can you say that the anticipated increased prices of the inventory slows up inventory purchasing?

Mr. GAINSBRUGH. Anticipated——

Representative GRIFFITHS. If he figures that in 30 days he is going to be able to buy it cheaper, does he slow up purchasing?

Mr. GAINSBRUGH. I think purchasing agents are constantly looking at forward prices and in terms of forward prices adjusting their purchasing policies thereto.

I think one of the saving graces of our postwar period has been the fact that we have cut back on production repeatedly, not severely, but repeatedly, rather than cut price. This is one way of clearing the market.

Another way is to cut prices drastically. The very process of cutting price reduces confidence in future prices leading to a holdback on the part of purchasing agents until prices are again firm.

In this way we have produced greater stability into the purchasing policy postwar than would be true had prices broken sharply.

Representative GRIFFITHS. Now, I would like to ask you if a corporate tax cut could be assumed by some fabricators to be reflected in decreased prices of the items they are going to buy?

Will a corporate tax cut be passed along in decreased prices?

Mr. PARADISO. You mean in prices?

Representative GRIFFITHS. Yes.

Mr. PARADISO. Well, as a judgment, I would say a variety of things could happen. Some might be passed on, some might be used for expansion of plant and equipment; there would be a whole variety of things.

Representative GRIFFITHS. I assume that would be true. But if a big fabricator assumes he is going to get a big price reduction, does it, will it, delay the purchase of inventory? Will a corporate tax cut have the purpose of delaying the purchase of inventory?

Mr. PARADISO. I don't think this would be the major factor just as I don't think in most cases a price increase anticipation is a major factor.

I don't think you can demonstrate generally that higher prices will induce increases in inventories, because the prices are going to be higher or conversely, I think the major factor is what the trend of sales is going to be; how much inventory does the firm need to meet those sales, and so in answer to your question, I would say maybe this is a factor but I don't think we can demonstrate that this would be an important one.

Representative GRIFFITHS. Well, Mr. Gainsbrugh has said, I believe, that he considers this an important factor.

I would like to have your answer.

Do you think a corporate tax cut would be passed along in decreased prices to the fabricators, and if this is true, would it affect inventories, purchasing of inventories?

Mr. GAINSBRUGH. I think a corporate tax cut at the moment would have its primary impact upon the rate of product innovation, the rate of capital investment, the improvement in the product itself, rather than contribute toward price reduction. In connection with the second part of your question, inventory policies currently, since there is great elasticity of supply, are far more keyed to the outlook for sales than to the outlook for price.

Now, that wasn't true in the first postwar decade. There the purchasing agent had a good fix on prices. We were living in an era of inflation. He bought that thesis.

Purchasing agents currently are living in an era of uncertainty as to future prices. They buy neither the prolonged upward course of prices nor the sharply downward course. They are embarked currently on a hand-to-mouth purchasing policy and would continue that even in the event of a corporate tax cut.

Representative GRIFFITHS. We have just about the most stable price index in the world, don't we?

Do you mean purchasing agents are now worrying about prices going up or down or are they worrying about our sales?

Mr. GAINSBRUGH. The firm as an aggregate is far more worried about its sales than it is about the prices paid by its purchasing agents.

Representative GRIFFITHS. And the purchaser is worried about price.

Mr. GAINSBRUGH. The purchasing agent himself at the moment, I think, is peripherally more concerned about the threat of deflation than inflation, as it relates to the price of the things he buys.

Mr. PARADISO. May I make a comment on this?

Representative REUSS. Yes.

Mr. PARADISO. You have indicated that prices are stable. But yet within the price structure, there are all kinds of changes going on, and I think the purchasing agents are looking at individual items. One item is in greater supply at one time, its price is affected, so it is this kind of thing.

Mr. GAINSBRUGH. We have selective price movements despite the plateau in the all-commodity order.

Mr. PARADISO. It is selective. So in the aggregate you get price stability but within the price structure all kinds of adjustments are taking place: supply adjustments, cost adjustments, and so forth.

Mr. LEWIS. I would just say about that that I would think that the effect of the corporate price cut toward reducing prices would be very moderate, pretty "iffy." Probably there might be some net downward effect on prices, but I wouldn't think that it would be something that purchasing agents would predict with much confidence and hold back for, therefore.

In any event it would be sort of a one-shot phenomenon. I don't see that it would have any lasting effect.

Suppose it did cause them to hold back from buying inventory a bit. It doesn't seem to me this would be a very disturbing business. I don't see this as any hazard so far as stability is concerned.

Representative GRIFFITHS. Well, it would have some effect to the extent that in place of a tax cut creating a boom, if it had any effect upon delaying inventory purchasing it might have the opposite effect.

Mr. LEWIS. Maybe a little. But I would say the plus effects that you get from it pretty quickly overwhelm these negative ones.

Mr. GAINSBRUGH. I would endorse that. Any number of investment decisions, capital expenditure decisions, capital appropriations decisions are currently being withheld awaiting the resolution of the tax bill currently before Congress, or the determination of the question of tax relief in the aggregate. The longer that indeterminateness prevails, the greater are the hazards of a downturn.

The capital budgeting process is growing increasingly formalized in industry. By late August or early September the capital budgets for next year will be pretty well locked up. So far as investment is

concerned this is the decisionmaking time of year, and there is still no definite decision relative to tax legislation.

Representative GRIFFITHS. Of course, the indefiniteness occurs actually because of the indefiniteness of whether they are going to get the tax reduction or not.

If they knew positively they were not going to get it they would make different decisions but if in the hope they were going to get it naturally they are going to delay because you would want to know what it is going to be, right?

Mr. GAINSBRUGH. I agree.

Representative GRIFFITHS. Thank you very much.

Representative REUSS. Senator Pell?

Senator PELL. As I understand it, the thought of all you gentlemen, and also the panel yesterday, is basically that inventory affects, accentuates, or aggravates recession or upsurge somewhat, perhaps, the way the full moon accentuates the tendencies to produce tides.

But I was wondering in studying our country which is so vast and where it is so hard to pull together statistics and here I am thinking particularly of Mr. Paradiso, if a study has been done coordinating the cause and effect of inventory with business cycles in the other smaller countries like Switzerland or Luxembourg or Western Europe; countries where the exercise we are going through this week may have already been completed and some results deduced from it.

Mr. PARADISO. I didn't quite get what the question was.

Senator PELL. Have there been studies done on this in Western European countries?

Mr. PARADISO. I really am not familiar with the European studies. I am familiar with the Canadian studies. They have done an extensive job in terms of what we are doing although they do a much more elaborate study.

Senator PELL. What was their conclusion?

Mr. PARADISO. With respect to the same question?

Senator PELL. Yes.

Mr. PARADISO. I don't think they came to any conclusion on this so far as I know.

Do you?

Mr. GAINSBRUGH. No; I don't know.

Senator PELL. In other words, to the best of your knowledge this is the first study of this sort that has been done?

Mr. PARADISO. This is the first study that has been done and I think looking at statistics in U.N. periodicals that we have more information, although we are quite dissatisfied with what we have, more information in this area, inventories by degree of fabrication, by industries and we are beginning to get some commodities, we have more than anywhere else.

So we can at least make some progress in determining the inventory impact, but other countries have done very, very little.

Senator PELL. Even though our country is vast and the industries are vast the difficulties of doing the study are not as great here as they are there.

Mr. PARADISO. That is right.

Senator PELL. Thank you.

Representative REUSS. Dr. Darling.

Mr. DARLING. Thank you, Mr. Chairman.

In hearings such as these which are devoted to the inventory factor in our economy it is, of course, extremely difficult to keep out of our discussions all the other aspects that play a role in causing our economy to behave the way it does.

We aren't in these hearings going to arrive at policy conclusions which solve all our problems. Our purpose is to try as best we can to focus on the inventory mechanism, to use Professor Lewis' expression, and to that end, I would wish to direct the panel's attention to a matter which deals specifically with it.

Professor Lewis made the statement, as I understood it, that the economy does possess a reversing mechanism attributable, in part, not in whole, but in part, to the fact that business firms must hold inventories which must be related to the level of aggregate activity. There is within this system a potentiality for turning points. This is not to say that inventories initiate reversals but that the economy as a whole, due to the holding of inventories, possesses this property.

Mr. Gainsbrugh, as I understood his statement, said that it was possible that, one or a few of the business turns in postwar period might have been due to this but he went on to emphasize the fact there were many other factors in specific situations.

As I understood Mr. Paradiso he went a little further in the other direction, and didn't feel that the inventory factor was very much involved in a reversing mechanism.

Now, my question then is, does the economic system that we have in this country possess a reversing mechanism built into it?

Now, in connection with this question, I want to direct the attention of the panel to chart 4 in Mr. Paradiso's statement and specifically to the 1960–61 cycle, and to the fact that, as I understand the chart——

Mr. GAINSBRUGH. Chart 4?

Mr. DARLING. Chart 4.

As I understand the chart, final sales were rising during the fourth quarter of 1959, the first quarter of 1960 and the second quarter of 1960 also. The major factor which was subtracting from aggregate demand, again if I understand the charts correctly, was the fact that business inventory investment fell quite heavily, between 1960, the first quarter and 1960, the second quarter. In replying to my basic question about a reversing process, I would like this particular cycle, this particular downturn reflected in the comments that are made.

Mr. PARADISO. I may want to start on this particular one because I think this is rather clear.

In 1959, you will notice the very substantial effect of the steel strike—105-day steel strike of that period.

Now, the steel industry quickly got underway in production. In fact, it amazed many producers that the industry could do so, and in the fourth quarter they were delivering steel and as a result, you see this accumulation of inventories in that fourth quarter.

Now, the question is what happened after that? I think part of the first quarter is again a reflection of trying to build up some inventories for that period.

But there is another factor that came in.

At that time we made a survey and asked businessmen what they expected their sales to be and their inventory, and these manufacturers expected the sales in 1960 to be substantially over the 1959 sales.

As a matter of fact, the number I remember is a 7-percent rise.

Now, in view of that they had built up a lot more inventories than was really needed because, in fact, the sales didn't turn out to be 7 percent up, but only 3 percent up.

So here is a combination of events, one at the beginning of the golden sixties, turning into the early period in 1960, business thought from here on out, the economy was going to be in an upward surge, they were very optimistic about sales for the year 1960, and so these inventory changes reflect that particular mood.

Secondly, you had some spillover of the accumulation needed as a result of the large liquidations through the strike period.

Now, I think in reply generally to your question, I don't think there is any question but that when purchases hold up pretty well, and we have had demonstrations of this during the postwar period, where personal income held up well because of transfer payments by the Government, because of built-in stabilizers and personal income held up very well, this resulted in the holding up of consumer purchasing.

At this point inventories began to look rather small in relation to the total purchases, and so later, afterwards, after the event, after we saw the strengthening of consumption, of buying, then the inventories turned around.

My thesis is that the inventories didn't start the turnaround and consequently initiated the reversal. But rather other factors, such as the Government unemployment compensation payments, the maintenance of dividend payments by corporations, other factors came in to hold up personal income, to hold up consumption which then made inventories look relatively small in relation to the total sales, and this required a turnaround and the buildup of inventory.

It is that kind of a sequence which I have in mind which is, I think, the way inventories operate in the economy rather than the inventories themselves looking small.

Now, the exception I make is in the case of a steel strike where the inventories are drawn down and they have to have more stocks and this initiates a buildup.

Mr. GAINSBRUGH. I would put my emphasis, as Mr. Paradiso has done, upon the strength of final demand as the reversal mechanism, and the contribution that strength of final demand makes in a period of contraction to the solving of the problem of excess inventories.

Ultimately, in the light of the continued strength of final demand, that demand has to be filled out of new orders rather than out of old production.

This starts the reversal; it leads to the lengthening of the workweek and all the different phenomena that accompany an upturn. The emphasis I place is thus the same as Lou's; it is upon the strength of the final demand, the contribution the cyclical snubbers and stabilizers make in maintaining final demand in a period of contraction and the resolution of the problem of excess inventories arising from the continuance of high final demand in a period of business contraction.

Mr. DARLING. May I just ask one question relative to what you just said?

Mr. GAINSBRUGH. Yes.

Mr. DARLING. Do you believe that one of the factors in our economy tending to snub the rise in final demand during expansion, might be those built-in automatic stabilizers in the budget which perhaps

cause a natural falloff in the rate of increase because of rising Federal surpluses and the action of the automatic stabilizers; that this, in turn, may slow down the growth of final demand, and I fully agree with your statement that final demand is the key thing here, and that in consequence the need to build up inventories tends to fall and this may be a factor in a situation and not necessarily the only factor. I am just looking for some systematic characteristics of our economy that might exist and work at times.

Mr. GAINSBRUGH. That is a rather involved question that I would have to study, I think, in terms of the basic hypothesis.

I believe the budget surplus contributes toward restraint. I would add monetary policy thereto in terms of the restraints that a tighter credit policy exercises as expansion nears its final phase.

I am reluctant, however, to accept an implied thesis if that is part of your question; namely, that we reach a point of equilibrium well before the full employment level solely or primarily because of our current tax rate. Many other factors are involved.

Mr. LEWIS. I would like to pick up this last question to Mr. Gainsbrugh, first.

I agree very much with the implication of your question. In fact, I would think this is a really much more important thing for the Joint Committee to be worrying about than inventories. I am one who does believe that the Federal budget has a surplus bias built into it secularly, and that unless you have periodic tax reduction with growth you do get the stabilizers, so-called, becoming snubbers, checking recovery short of full employment in a very serious fashion.

I think this fiscal policy thing is the most important phenomenom to worry about. But there are also some similar dangers in the realm of monetary policy.

So far as the inventories are concerned, I would put my position this way: I think there are self-reversing properties in the inventory mechanism as such in the sense that if we could imagine final demand moving along through time and in a perfectly stable way, and that for some reason inventories got pulled off away from the level that firms wanted to hold, then you would have a kind of cycle, a self-reversing cycle, started. This would stem simply from the fact that firms would for a while be buying and producing not only to meet sales but to build their inventories. Eventually they would get them built and then this increment in their purchases and production would be taken out as they tried simply to level their inventories. And at that point you would get a downward impact on sales and reversal a la the Metzler model.

But I think this is a fairly small sort of unstablizing phenomenon in the economy. I think it has become of diminishing importance in the postwar period. I think the most important thing to be said about it in the way of reassurance relates to the accrual during the postwar period of these various built-in stabilizers, some in the public sector and some that were in the private sector. We had very good luck in insulating final demand and particularly consumer demand from a cessation in inventory buying.

Consequently the overall picture I see is of an inventory cycle that plays itself around the downturn when we get it, and the immediate upturn. I think of the sort of typical business fluctuation in the postwar period as being a three-part phenomena. There is a down-

turn, there is a rather rapid recovery, and then there is a sort of third, along-the-trend, prosperity phase before we get into the next downturn, I think that the main thrust of these things is determined by the noninventory factors. And inventory reversal is rather more important in timing the upturns than the downturns.

The evidence seems to be that inventory investment peaks well before the next downturn. Thereupon, typically these other, nonrythmical, almost random demand factors come along to keep the thing going for a considerable time before the next downturn comes.

Mr. PARADISO. I would like to make a comment on your specific question.

We have had built-in stabilizers, of course, throughout the postwar period. After the 1953–54 recession we got back to what you might call a relatively full employment situation.

It happened in 1947–48, too, and in the 1953–54 cycle. We have had some problems since. The problem has been after 1957.

Now, I think this would be an exceedingly important question to examine; namely, what has happened to the structure of the economy since 1957 which has resulted in our failure to get a full employment situation and which appears that we had the 1960–61 truncated recovery, you might call it, and I don't know what is going to happen, say, a year from now.

But anyway, it seems to me that we have had built-in stabilizers before 1957 and yet we were able to achieve full employment, since 1957 three things have happened: (1) Plant equipment spending did not recover; (2) purchases of automobiles were not up to what you might call the full demand at the incomes prevailing; and (3) residential construction didn't move up in line to the prior postwar trend.

So to me, a study on these three basic demand factors of the economy particularly, since 1957, I don't mean we haven't studied it, we have done a great deal in examining the situation, but a more thorough study would be really exceedingly important.

Mr. LEWIS. Louis, it is interesting, however, that the last personal tax cut was in 1954. We are still living with the same personal tax structure we put into effect at that time.

Mr. GAINSBRUGH. I would say we have had the three phenomena to which Louis has referred and a fourth which may be closely related to all three.

Since 1955–57 we have had attrition, if not anemia, in the profit sector of American industry relating profits either to gross national product or to national income. This is particularly evident in the after tax rather than before tax position.

Mr. PARADISO. Would you consider the cash flow?

Mr. GAINSBRUGH. No. I would consider the cash flow as it relates to depreciation of existing assets and their replacement as distinct from the risk-taking new enterprise type of expansion that is primarily sparked by profits. I think all four factors are closely related. We ought to begin to explore intensively the cost aspects of Government as they relate to growth, in addition to the benefit aspects of Government spending, so frequently stressed.

I think for a long period of time particularly in the thirties, Government expenditures may conceivably have had a higher multiplier than investment in the private sector.

I believe today the investment multiplier in the private sector is higher than additional investment in the public sector, say for parks, recreation, and the like. If we are concerned about accelerated growth in the future, we might profitably examine the impact of high governmental costs and the financing of those costs upon private investment.

Representative REUSS. Let me just, in conclusion, explore this last point that Mr. Gainsbrugh is making about profit anemia.

To what extent might that profit anemia be due to the other three factors, namely, the fact that, taken together, they have resulted in a growth rate that dissatisfied many people?

If we had had a boom in these other three factors, wouldn't profits have been better?

Mr. GAINSBRUGH. Yes, but I think we could pretty well demonstrate that it has been the second, the lack of profit, that has held back investment currently rather than the lack of investment opportunities.

Mr. LEWIS. Mr. Chairman, I can't agree with this. It seems to me, of course, we are getting pretty far afield from inventories, but the overwhelming problem of this period since 1957 had been insufficient demand.

It seems to me that when you consider the operating rates of most corporations, the relation between production and their capacity, that profit performance has been remarkably good, if not good enough from the point of view of encouraging further investments. What has been hurting business is lack of sales, represented by the various deficiencies in demand that Mr. Paradiso has listed.

The issue is a sort of a chicken and egg thing, but it does seem to me that it is an inadequacy of aggregate demand which has been the problem in this period and that has been the explanation of our slowness of growth.

Representative REUSS. I was tired of the harmony which had prevailed here and I thought an argument should come up as we are approaching the witching hour.

But, Mr. Paradiso, do you have something to add?

Mr. PARADISO. Yes, sir, very briefly, a comment on this.

If we disregard the cyclical swings, corporate profits before taxes or after taxes as a ratio to GNP has been declining throughout the entire postwar period so it is not a phenomenon of the recent experience but it goes back before.

Mr. GAINSBRUGH. Nevertheless, if I may come back to your question, Mr. Chairman, a deep ideological rift exists between the business economist who places emphasis in his diagnosis upon the inadequacies of investment as distinct from the academician, many academicians and Government economists who place their emphasis upon lack of demand rather than upon the inadequacies of incentives for investments I believe this whole question that could profitably warrant a considerable investment of time and resources by this committee.

Representative REUSS. It surely could. It is the subject matter of a great debate which ought to be taking place about tomorrow, I should think.

I am very grateful to all of you gentlemen for the substantial contributions you have made. The subcommittee will now stand adjourned until 10 o'clock tomorrow morning at which time it will

reconvene in room 304 of the Old House Office Building, there to hear witnesses on the subject of the relation of inventory fluctuations to price level changes and rate of utilization of producer capacity.

I would also like to announce that the hearings both Thursday morning and Thursday afternoon will be held in room 304 of the Old House Office Building, but the hearing Friday morning will be held in this room here as originally scheduled.

Thank you all, and the subcommittee will now stand adjourned.

(Whereupon, at 12 noon, the subcommittee stood in recess, to reconvene at 10 a.m., Wednesday, July 11, 1962.)

INVENTORY FLUCTUATIONS AND ECONOMIC STABILIZATION

WEDNESDAY, JULY 11, 1962

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON ECONOMIC STABILIZATION,
AUTOMATION, AND ENERGY RESOURCES
OF THE JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee of the joint committee met, pursuant to recess, at 10 a.m., in room 305, Old House Office Building, Hon. Henry S. Reuss presiding.

Present: Representatives Reuss, Griffiths, and Senator Pell.

Also present: William Summers Johnson, executive director; John R. Stark, clerk; Paul G. Darling, economist; and H. D. Gewehr, research assistant.

Representative REUSS. Good morning.

The session of the Subcommittee on Economic Stabilization, Automation, and Energy Resources will be in order.

This is a continuation of our weeklong series on inventories and their effect on the economy.

I want to welcome Mr. Robertson, of the First National City Bank; Mr. Fred Holt, of the General Electric Co.; Mr. Charles Holt, of the University of Wisconsin; and Mr. Franco Modigliani, of MIT.

Before starting the discussion of this morning's subject, I will ask our economist, Dr. Paul Darling, if he would undertake to summarize the task force report entitled "Inventory Fluctuations, Price Level Changes, and Economic Growth," and dated July 6, 1962.

Dr. Darling, will you undertake to give us that summary?

Mr. DARLING. Thank you, Mr. Chairman.

We thought it would be well to have this summary to help focus up the material that we will want to discuss today.

In presenting this material I would like to make initially clear that the propositions to which this task force report is being addressed represent, I think it is fair to say, some tentative conclusions and findings, and the word "tentative" is to be given a certain amount of emphasis.

They are, however, of such importance that it seemed well worthwhile for us to consider them, and one of the purposes of this panel is to consider these propositions in all their aspects this morning.

Very briefly, I should, therefore, like to summarize the basic propositions with which the task force report deals and I shall refer to the three charts which are on this side of the room.

First, I wish to refer to chart 3, entitled "Comparison of Vendor Performance, Unfilled Orders of Manufacturers, Prices Paid by Purchasing Agents and Inventory Change" (which is shown on p. 22).

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I wish to address myself initially to the proposition that supply conditions in markets for materials and components needed by manufacturers in their production undergo rather large and substantial changes and that this is an influence on inventory positions of purchasing firms.

The first graph line here shows for the postwar period 1947–60 what is called vendor performance, and this line represents the percentage of reports turned in by purchasing agents who were reporting longer delivery periods by its suppliers minus the percentage of reports reporting shorter delivery periods.

In other words, this may be looked on as a net measure of whether the delivery periods are lengthening or falling.

When the net percentage is above the zero line it means that delivery periods are lengthening, and they lengthen in this period that I am pointing to which runs from the trough of the 1949 recession through approximately mid-1951.

The amplitude of the line above zero represents the speed at which delivery periods are lengthening. This peak at about mid-1950 represents a period of maximum rate of lenthening.

All right, now the first proposition to which I wish to address myself, is that this vendor performance measure of delivery period is associated and seems to influence the inventory positions of the buying firm, purchasing firm in these markets.

That is to say, when vendor performance and supply conditions are deteriorating and leadtimes are lengthening, this is a period when inventory accumulation, inventory investment, is increasing.

The argument, the rationale behind this is that when supply conditions are deteriorating the purchasing firm eventually finds itself in a situation of uncertainty with respect to the availability of supplies, and it raises its inventory objective, deciding that it needs a larger purchased materials inventory to get through this period of uncertainty in supply conditions.

The second panel of chart 3 shows the change in unfilled orders. Again, unfilled orders are rising over the period that I am pointing to, from the trough of the 1949 recession to about mid-1952.

They are increasing until we come to about mid-1952 when the change in unfilled orders comes back down to the zero line. That is all a period of increase.

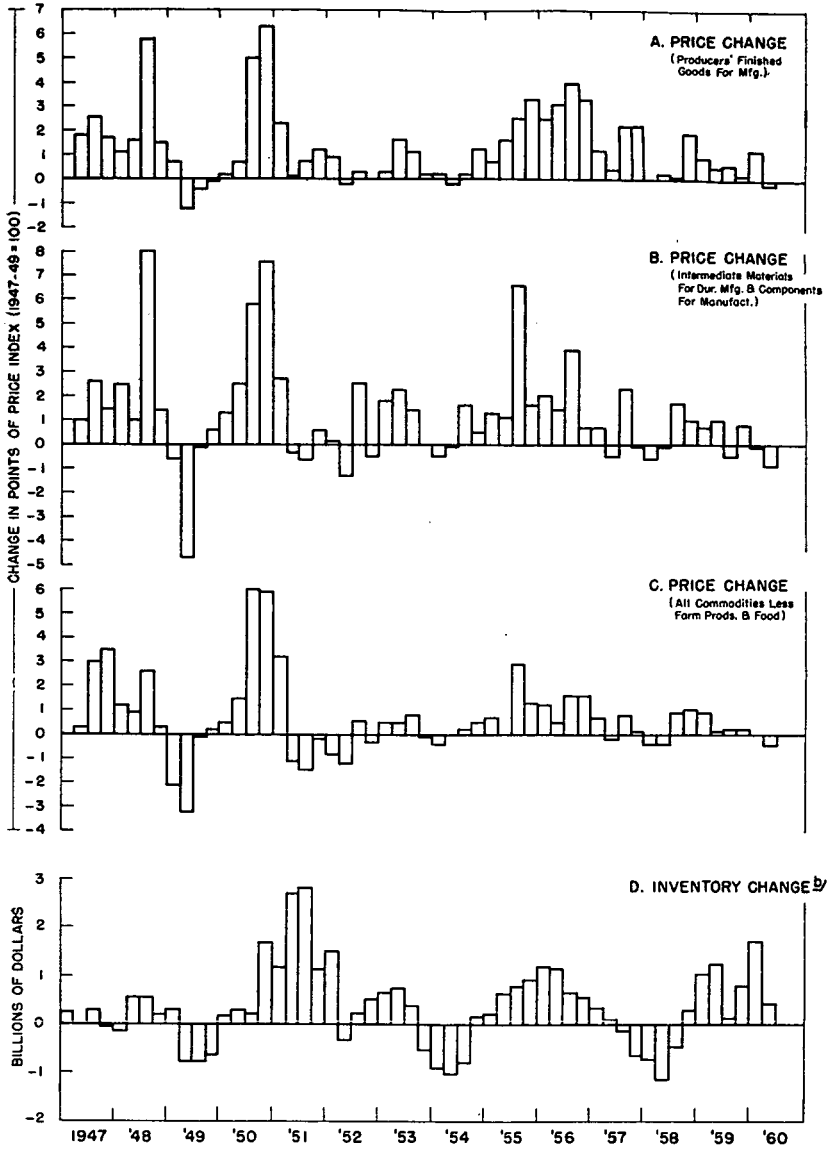
The peak in early 1951 represents the maximum rate of increase of backlog of orders. The backlog is clearly associated with the delivery period situation shown in panel 1. When delivery periods are lengthening, backlogs are rising, when delivery periods are rising their fastest, backlogs are increasing their fastest, and these two are associated with inventory change and the first proposition is that these supply conditions do affect the inventory objectives of firms purchasing in those markets.

The second proposition is that these periods of rising inventory investment and deteriorating supply conditions are also periods of rapid price increase in the cases that I wish to point to.

I refer now to chart 5, entitled "Changes in Selective Components of Wholesale Price Index and Change in Manufacturers' Inventories," which follows:

CHART 5

CHANGES IN SELECTED COMPONENTS OF WHOLESALE PRICE INDEX AND CHANGE IN MANUFACTURERS' INVENTORIES 1947 to Second Quarter of 1960[a/]



a. Quarterly price changes in points of Wholesale Price Index of Bureau of Labor Statistics (1947–49=100) measured from last month of one quarter to last month of succeeding quarter. Data for 1st quarter of 1947 not available.

b. Quarterly change in manufacturers' inventories after inventory valuation adjustment, seasonally adjusted in 1954 dollars.

Source: Department of Commerce.

At the bottom, panel D, manufacturers' inventory investment is shown, and you will see three main periods of rapidly increasing inventory investment: 1950–51, and late 1954 through 1955, and finally mid-1958 to mid-1959.

These are also periods when price changes are positive and relatively large. I draw your attention to the roughly parallel association between inventory investment and price change. The three panels of wholesale price components shown in chart 5 are producers' finished goods for manufacturing at the top; below it is price change for intermediate materials for durable manufacturing plus components for manufacturing; and in panel C is the price change for all wholesale commodities, excluding farm products and food.

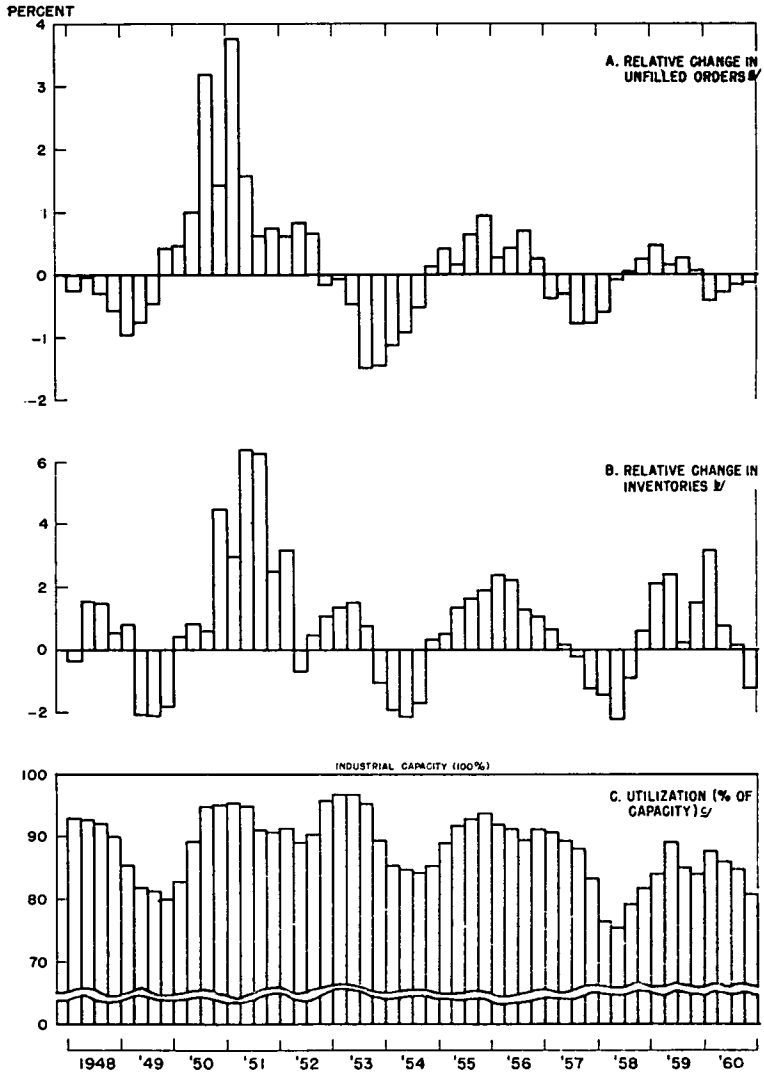
The height of those price change bars shows how fast prices went up, the extent of the price increase during each quarter, and you will see a rough parallel between the rate of price change and the rate of inventory investment.

Again, going back to chart 3 (see above, p. 22), down here in the third panel, we have prices paid by purchasing agents, the net percent expanding. When this line is above the zero line, we have prices rising, and the height of the line above the zero line shows how fast prices were rising during the particular period. This peak in late 1950, for example, is a period of maximum rate of price increase, and again you will see a rough parallel between supply conditions as measured by vendor performance and unfilled orders, and the rates of price increase and inventory investment.

The next proposition that the task force report devotes itself to is the relationship of capacity usage, capacity utilization, to the associations that have just been mentioned, and I next refer to chart No. 4, entitled "Comparison of Quarterly Changes in Manufacturers' Unfilled Orders and Inventories, as Percentages of Total Inventories, and Rate of Utilization of Industrial Capacity, 1948–1960," which follows:

CHART 4

COMPARISON OF QUARTERLY CHANGES IN MANUFACTURERS' UNFILLED ORDERS AND INVENTORIES, AS PERCENTAGES OF TOTAL INVENTORIES, AND RATE OF UTILIZATION OF INDUSTRIAL CAPACITY, 1948-1960



a. Change in unfilled orders in 1954 dollars as percentage of total inventories, all manufacturing. Source: Department of Commerce. (Price deflation by author.)

b. Change in inventories after inventory valuation adjustment, seasonally adjusted in 1954 dollars, as percentage of total inventories, all manufacturing. Source: Department of Commerce.

c. Capacity utilization data taken from the Joint Economic Committee publication, Inventory Fluctuations, Price Level Changes, and Economic Growth.

In the bottom panel are bars representing the estimates of the rate at which industrial capacity was being utilized quarter by quarter during the period.

For example, although I find it difficult to read exactly the figure, the rate of utilization of capacity in mid-1953 was approximately 96 percent of capacity, perhaps a little more, that being my estimate from the graph.

You will see that during the period following the Korean war successive business recoveries and expansions brought capacity utilization to maximum percentage rates which are successively lower.

During recent years capacity has become less fully utilized during successive business peaks, as you see from the chart.

Associated with this declining rate of capacity utilization in recent years, shown in chart 4, are the graphs of changes in inventories and unfilled orders shown in the upper two panels.

One would expect that when capacity is less fully utilized that during business recoveries supply conditions would not deteriorate so quickly nor to such an extent, that backlogs of unfilled orders would not rise so high nor so swiftly because of the existence of excess capacity.

The first panel shows the change in unfilled orders and although the Korean period, of course, is a major situation to be explained by war conditions, you will see, I think that during successive periods of recession and recovery, there seems to be a dampening of the fluctuation in change in unfilled orders, and the proposed partial explanation is that industrial capacity being less fully utilized has resulted in a lesser swing in this unfilled order situation because supply conditions do not deteriorate so quickly with excess capacity.

This middle panel of chart 4 shows the swing in inventory investment, and if one will make a mental adjustment for the steel strike in 1959, that is to say, inventory investment was dragged down during these two quarters that I am pointing to, third and fourth quarters of 1959, then there is a catch-up period following and if one can make a mental adjustment, so to speak, for the disturbance of the 1959 steel strike there is some evidence, I think, that the swings in inventory investment appear to be moderating somewhat in association with the lesser swing in unfilled order changes and increasing excess capacity.

These tentative propositions are advanced to suggest that if some way could be found to moderate swings in inventory investment the pressure on prices during periods of business recoveries, when supply conditions tend to deteriorate, if this could be moderated, it would permit the trend of gross national product to be lifted closer to a capacity ceiling without generating such rapid supply condition deterioration during short-run expansions and the result might be a smaller push on prices.

This would, in itself, increase the available output for the economy, and might produce a more rapid rate of economic growth.

If a higher rate of capacity utilization is a factor in encouraging expansion of plant and equipment, then through a proper use of fiscal policy it might be possible then to raise the rate of capacity utilization, and this through increased profits, and greater incentives to increase capacity might then raise the rate of economic growth.

Mr. Chairman, these are the main propositions which are advanced somewhat tentatively for discussion this morning.

Representative REUSS. Thank you, Dr. Darling.

We will now hear from the panel.

Mr. Robertson, would you be good enough to lead off? I don't know whether you have a prepared statement or not.

Does each of the panelists have a prepared statement?

Mr. FRED HOLT. Mine is not prepared but I would like to say a few words before we start.

Representative REUSS. Does Mr. Charles Holt have a paper?

Mr. CHARLES HOLT. Yes.

Representative REUSS. And Mr. Modigliani, do you have a paper?

Mr. MODIGLIANI. A few remarks.

Representative REUSS. Without objection, the prepared papers will be incorporated in the record, and I will then ask each one of you to proceed either by reading his paper, by summarizing it, or by any other method.

Mr. Robertson, will you start off, please?

Mr. ROBERTSON. May I read the statement or comment?

Representative REUSS. You may do both or proceed in any way you like. You may want to read or summarize your paper to comment on the summary that has been made.

STATEMENT OF NORMAN ROBERTSON, FIRST NATIONAL CITY BANK, NEW YORK CITY

Mr. ROBERTSON. Mr. Chairman, inventory policy is no longer decided in an atmosphere of supply shortages, rising prices, or low interest rates. The behavior of inventory demand, over the course of future business cycles may, therefore, bear little or no relationship to the pattern which has been established during the vigorous economic environment of the 1950's.

Aside from distortions which are caused by stockpiling in anticipation of labor disputes, the majority of inventory maladjustments are unplanned and stem primarily from imperfections in the art of forecasting.

As the sales forecast usually provides the basis for the control of inventories and the level of production, it follows that an unplanned depletion or accumulation of stocks will inevitably result if sales exceed or fall short of the forecast.

Inventory distortions which result from forecasting imponderables are likely to be further aggravated by difficulties which are associated with abrupt change in the level of output. For example, although excessive inventory may warrant a reduced rate of production, companies are often reluctant to curtail operations and incur the subsequent penalty of a rising level of fixed expenses which may be higher than the anticipated rise in inventory investment.

This factor coupled with a natural unwillingness on the part of management to concede that a decline in sales is anything except a temporary phenomenon is always reflected in inventory maladjustment following a peak in sales activity and also immediately following a trough.

I would judge there is a lag of between 60 and 90 days in both of these cases.

Accurate sales forecasting holds the key to more effective control of inventories, yet predictions of precise turning points in sales or

economic activity have proved to be elusive goals for the forecaster and are likely to remain so.

Even if new or improved techniques were to better the generally poor record of business cycle forecasting, business management would be hesitant to risk either a curtailment or an expansion of production until they were certain that business was improving or falling off.

In other words, this lagging response of production to a new sales rate means that stocks either accumulate or are depleted.

Although better methods of inventory control through the use of electronic computers and improved forecasting techniques may tend to moderate inventory fluctuations in the future, the uncontrolable and unforeseeable nature of sales changes for the majority of business companies strongly suggests that in a free economy such imbalances are not going to be entirely eliminated as a feature of aggregate business activity.

Policy, Mr. Chairman, is unlikely to have much success in controlling inventory fluctuations, as such movements tend to be an integral part of the free enterprise system. Under these circumstances I am extremely skeptical of those proposals which suggest that Government action can swiftly or easily rid us of these troublesome fluctuations.

For example, it is unlikely that the incentive of a tax concession would persuade many companies not to increase inventories when sales are rising. Likewise, in a period of declining sales would a tax concession really induce companies to hold excessive stocks in the hope that demand will improve at some undetermined date in the future? In much of the durable goods sector risks of product obsolescence would also add to the hazards of accumulating unwanted inventory.

I would also seriouslv doubt that changes in interest rates would have any appreciable effect on the holding of stocks. Experience in the United States and Western Europe has shown that the level of interest rates is not the dominant influence in business inventory policy.

Also, to operate a policy designed to smooth these inventory fluctuations would be an almost unmanagable administrative task, particularly as the cyclical pattern of sales tends to differ between industries and the availability of prompt and precise data on stock movements is seriously limited both in quantity and quality.

Finally, fluctuations in inventory are inimical to the best interests of business itself and I believe therefore that business has already sufficient incentive and motivation to control and mitigate these swings in stocks without further Government action in this field.

Thank you.

Representative REUSS. Thank you, Mr. Robertson.

Do you wish to comment on anything that was suggested by Dr. Darling's summary?

Mr. ROBERTSON. There is little doubt, Mr. Chairman, that the fluctuations shown on Dr. Darling's charts are symptomatic of the booming and inflationary economic environment of the last decade. Business sentiment during much of this time was buoyed by what appeared to be an almost endless demand for manufactured goods, which, in large measure, stemmed from a 16-year period of depression and war.

The principal concern of most companies was supply shortages accompanied by extended delivery dates and the consequent inability to meet customers requirements. In this expansionary business climate sales expectations were often excessively inflated and optimistic, inventory control procedures were limited in scope and application, and sales forecasting techniques were, in many instances, unsophisticated and assumed a sustained and uninterrupted period of rapid economic growth. Combine these management deficiencies with an economy operating close to its capacity ceiling and wide fluctuations in inventories were almost unavoidable.

The changed relationship of output to capacity since 1957–58 has gradually relegated supply problems to the background while caution rather than expansion has become the dominant theme for many companies. In this vastly changed business climate of the early sixties attention has been focused on the cost of carrying inventory which includes not only the interest charges on invested funds but storage costs and the risks of spoilage and obsolescence. Thus, although businessmen still balance the cost of inadequate stocks against the cost of holding excessive or unnecessary inventory the, remote possibility of any supply shortages has now placed heavy emphasis on the need to maintain the lowest level of inventory which will sustain production at the most economical manufacturing cost.

In many manufacturing enterprises, moreover, the basic yardstick which is used to measure the effectiveness of management performance is return on investment, which provides a strong incentive for the manager of the enterprise to cut costs and work existing investment harder, particularly at a time of weak selling prices and low profit margins.

These developments suggest to me that, even if this country were to experience tighter supply conditions than during the early sixties, the new techniques of inventory control and forecasting, coupled with a greater use of operations research, will tend to limit and moderate the degree of inventory fluctuation as compared with the postwar period.

Representative REUSS. Thank you, Mr. Robertson, very much.

Mr. Fred Holt, will you comment?

STATEMENT OF FRED H. HOLT, GENERAL MANAGER, HOUSEHOLD REFRIGERATOR DEPARTMENT, GENERAL ELECTRIC CO.

Mr. FRED HOLT. Mr. Chairman, I don't really have any formal statement to make but I would like to qualify my limitations as a witness here today.

Actually, as a manager of a consumer-product business, my experience and my knowledge and my background of this subject are not the same as some of these experts, I guess you would say, today, or at least economic men to this subject.

But I am very interested in the subject that the committee is trying to look into and trying to find a solution to it.

Actually, in our business, which is the appliance business, inventory is an extremely important subject to us, and in our case inventories are primarily determined by the consumer demand, demand that he has today for a product and what we anticipate that his demand may be down the road.

Now, of course, there are other factors involved in inventory. There is the fact that we try to smooth out seasonal changes in demand and employment that occur.

We always try to use an efficient production rate. I think that there are always short-term economic implications which are involved in inventory.

There have been times of critical material shortages such as the recent steel shortage and, actually, the fundamental that we look at quite often is this inventory-sales relationship.

The thing I would like to say, though, is that our business is really to serve the customer, and inventory is only, I think you would say, a means to an end, with us. We found over a pretty long period of time that our customers are pretty changeable people. I guess you would say they are living in a changeable environment in our country in these days and inventory is a risk to us.

If I don't manage my inventory right, then I am in real trouble as far as my business is concerned.

I read about inventory and I hear about it up here. It is a little bit different, it seems to me, to talk about inventory as aggregate number of dollars or some cold statistics, but in our particular case, inventory of specific appliances, refrigerators, ranges—and every one of these has a potential obsolescence.

If we don't find ways to get these products to the customers at the right time, the right place, and the right product, then we are in pretty serious trouble.

So, actually, what I want to say is we have no—I have no—incentive personally to speculate in inventory or purchase materials.

If my inventory ratios get out of line with traditional pattern, the chances are I will hear from my division manager, the man for whom I work.

Now, in unusual cases, such as when we had the recent steel problem, I may get suggestions that apply to company components that have the same kind of problems where we want to base our decisions on a uniform base, but, in general, I have the authority to spend the dollars that are required to put inventory in our distribution system to serve the customers adequately.

But you may ask: Well, how do you determine how you serve a customer adequately? I think we determine that primarily by our experience—what we found in different parts of the country.

We determine it by analyses that we are making all the time. But we have been doing a lot, and I think this is true in the whole appliance industry, although I can only speak for our company, in trying to improve our inventory management.

We have done such things as making our factories more flexible so we don't have to keep building the same model for a long period of time so if the customer changes demand we change the product that he wants.

We also have taken on financial responsibility for some of our distributors' inventory and a few of our retailers' inventory on a trial basis.

Our thought here is: This is going to relieve the distributor and the dealer of some of these inventory-oriented decisions they make when there is a time of changing demand, and that sometimes is amplified back on the factory.

Another thing we are trying to do and we are making real progress in doing it is improving our communications system so we will know about shifting demand that customers had for products.

Representative REUSS. How do you do that?

Mr. FRED HOLT. On communications?

Representative REUSS. Yes.

Mr. FRED HOLT. Well, actually what we have done is we have perfected, I shouldn't say perfected, we have improved our communications system by—we have several ways. First of all, we have a warranty card that comes in from our customer, and most all of you who have bought an appliance have found inside the appliance a warranty card which says, "Fill it out."

That comes back to us and about half the people who buy appliances send back a warranty card and we can equate the percentage that come back and so we can tell how many people are buying appliances in the marketplace.

Another thing, we have our distribution sent us on teletype so we will know on Monday morning how many of the models of appliances have been sold. These are some of the things we are doing to improve our communications system so we will know what customers are buying in the marketplace but there are several things inherent in any inventory like ours and that is the fact I think we are going to want to try to smooth out employment when there are changes in seasonal demand.

Many of our products are seasonal—air conditioners, dryers—and we try to smooth out so we build ahead for those periods of time.

Another thing is there are certain economic advantages to stabilize production in a mass production factory and these economic advantages have been and must continue to be passed on to the customer and that is a factor in inventory that will always be that way, I believe.

Then another factor, any time a customer changes his mind and customers can change their minds, it takes time to get different parts, if you plan you are going to build a certain model.

So that is a factor in inventory.

I think everybody knows that prices in appliances—I guess you might say that appliances are a very price sensitive product. I think there is probably some relationship between volume and prices and it has implications as far as inventory, but frankly I have to admit I don't know what those implications are.

I don't know that I understand the relationship of factory capacity and variations in inventory and actually I expect to learn a lot more today than to contribute but other than information that would be valuable to competitors I would be glad to tell you what I can.

Representative GRIFFITHS. May I ask, are you talking about inventory that you build to supply the customer as well as the products you are buying that create that inventory interchangeably?

Mr. FRED HOLT. To your point, Mrs. Griffiths, we have three inventories. We have an inventory of parts we buy to supply our factories so we can build the things customers want.

Then there is an inventory that in our business we have about 38 distributors, who are people who distribute our merchandise to the dealers, depending on which company, maybe 10,000 or 15,000 dealers.

So, the distributor has an inventory of products, and the dealer has an inventory. So we have our stock of raw material and parts in process in the factory.

We also have a factory stock of finished appliances with which we either serve the distributor direct or we serve the dealer direct.

In many cases the dealer buys from a distributor, in some cases we ship him directly from the factory even though he buys it from the distributor; in that way we cut inventory out of the system so he doesn't have to have an inventory to supply that.

So, to your point, I was talking primarily about the finished stock inventory, that is the thing that can change most often.

Representative REUSS. Thank you, Mr. Holt.

Mr. Charles Holt.

Mr. FRED HOLT. He is not my brother.

Mr. CHARLES HOLT. No collusion. [Laughter.]

STATEMENT OF CHARLES C. HOLT, PROFESSOR, UNIVERSITY OF WISCONSIN

Mr. CHARLES HOLT. On the basis of the statistics that Mr. Darling has presented it is quite clear that the American economy has a problem of economic fluctuation. Far from pursuing a nice steady growth trend the economy tends to run hot and cold, roughly every 3 years.

This, unfortunately is not a pattern of just the recent decade, but is the pattern which can be found in earlier periods of American history running back over the previous 50 years. The inventory dynamics associated with this short fluctuation is a very fundamental part of the American economy, and is a long-lasting problem.

The reason that this problem is now in sharper focus is that the larger economic fluctuations of the type that we had in the thirties, the really cataclysmic fluctuations, these have to some extent died down and so the smaller fluctuations are now more noticable.

I would like to comment in passing on Mr. Robertson's point, which is certainly a good one, that part of the problem is one of forecasting. If business firms knew what their sales were going to be they could better plan their inventories and they would be less often thrown off balance by finding that they have built up inventories in anticipation of sales which did not occur. Then they have undesirably large stocks of inventory to be worked off and this can only be done by decreasing orders to their suppliers and decreasing their own production rate. Even though the firm is trying to maintain a stable pattern of production, if they make these errors in forecasting, they are forced to fluctuate the production rate.

Unfortunately, some of the studies that have been made indicate that perfect forecasts would not altogether eliminate this problem. It would eliminate part of the problem, and allow business firms to plan their inventory better, but for reasons that I will try to make clear in a moment, there still would be a substantial problem associated with inventories.

I would like to step back a minute and try to characterize this problem by looking at an analogy. The American economy is like an automobile without shock absorbers that is driving down a rough road and is continually being subjected to shocks. Certainly the American

economy is being subjected to shocks; changes in international demand, the cold war running warmer and cooler, fluctuating military spending, fluctuations in capital investment decisions by business firms, and many other things that could be mentioned are continually stimulating or depressing the economy.

There is nothing, I think, that can be done that will protect an economy from this kind of continual disturbance, and the real question is what does the economy do when it receives one of these disturbances? When you get a steel strike that lasts 3 months and closes down a large sector of the economy, what is going to be the response of the economy?

You know what a car would do without shock absorbers—you would be continually banging against the axle at one extreme, and hitting your head on the ceiling at the other extreme.

There is an analogy in the economy. Bouncing against the axle would correspond to excessive unemployment, and if we get an excessively high aggregate demand this is going to lead to the problem of inflation.

So the problem in trying to improve the performance of the American economy is to try to avoid these fluctuations that occur when the economy is shocked. About the time you have gotten over the effect of one of these disturbances there will be another disturbance that comes along and starts the process all over again.

These shocks tie back into the forecasting problem. You can't really foresee their coming, they will happen and the economy will be disturbed. The key is: What can be done?

There has been a lot of talk in recent years of built-in stabilizers. When the national income falls certain things will happen automatically: unemployment compensation payments will rise, income tax collections will fall, and so on. You can think of these, if you will, as analogous to the springs of a car. If the car gets low, the springs push back harder and tend to restore the level of the car. But springs don't prevent the car from rising and falling in a continual oscillating pattern.

It is the shock absorbers in a car that prevent continued oscillation. When the car is rising the shock absorbers act against the increase in the level of the car, and when the car is falling, the shock absorbers turn around and act in the opposite direction.

We are talking about economic fluctuations lasting in the order of 2 or 3 years. If we are going to put something in the economy that performs the function of a shock absorber to damp out fluctuations, it will have to be fast acting. As we can see from reading the newspapers today there are very real difficulties in getting fast corrective action. There are long-term lags involved in the legislative process so we have a difficult problem when we face the question of what can be done about fluctuations that are associated with the inventory cycle.

To relate this discussion now to the inventory phenomena, I would suggest that the reason the American economy tends to be particularly vulnerable to shocks is that the inventory relationships act like negative shock absorbers.

When national income is rising, this tends through the behavior of inventories to stimulate the further rise in the economy. When the national income is falling this tends to stimulate its decline. Many

relationships are tied up with inventories that produce exactly the wrong results.

Specifically, when sales rise, Mr. Fred Holt will confirm, I think, that retailers feel they need a higher level of inventories to adequately serve their customers, the distributors want higher levels of inventories to serve the retailers and the manufacturers find that larger stocks of in-process inventory, purchase materials inventory, and finished goods inventory are necessary to maintain the higher production rate. Indeed, many business organizations try to keep a constant ratio between sales and inventory, so that if sales doubled there would be a tendency for the firms to want to have double their inventories.

Now, you can see that if sales rise in the economy, business firms increase production, not only to supply this new increased level of sales, but also to build up the stock of inventories.

This gives you the situation that when national income is rising for the economy as a whole, sales increase and inventories are increased. This leads to an exaggerated fluctuation of production, so that production tends to fluctuate more than final sales, and with the fluctuation of production, you get the increase in income payments which go to consumers, and in turn influence the fluctuations in sales.

I am sure these mechanisms have been thoroughly discussed in the hearings on previous days. They are certainly at the heart, I think, of the tendency toward instability in the American economy.

In addition to inventories fluctuating, business firms on seeing sales rise tend to go out and place orders on their suppliers, so that the backlog of orders also rises. At the same time that sales rise business firms find an increase in the stock of unfilled orders, and this supplies a further stimulus to production. When national income is rising the increase in the backlog of unfilled orders rises and this stimulates production. So when business is getting good there is further stimulus for business to get even better. This gives you a kind of negative shock absorber effect. The tendency toward fluctuation of the economy is increased.

My last point Mr. Fred Holt referred to in passing. Both of the things we have been talking about, the fluctuations of inventories and fluctuations of back orders, start off at the retail level and as sales increase at the retail level, the retailers build inventories, but in addition they increase their outstanding orders still further.

The distributors see the increase in orders coming to them. In trying to cover their sales and increase their inventories they pass orders back along to the manufacturers. They do the same thing, passing orders on to the raw material suppliers and other manufacturers.

You get a crack-the-whip effect here. A fairly small fluctuation in sales at the consumer level will lead in general to a larger fluctuation of sales at the distributor level, and perhaps a still larger fluctuation of orders at the manufacturer's level. When you get back to the raw material suppliers, they can really be subjected to very large whiplash effects. I would like to have Mr. Fred Holt's comments on this particular point.

There are, in addition to these basic mechanisms, quite a number of what might be called vicious circles that have been discussed in papers which have been prepared for the committee.

For example, when orders are increased, then the backlog of unfilled orders gets larger; this increases the leadtime the manufacturers have

to quote, and when the purchasers see lengthening leadtimes, they will want to order further into the future, which will force them to place new orders.

Now you have gone around a cycle. You started off with an increase in orders, increase in backlog, increase in leadtime, leading back to a further increase in new orders.

There are several other vicious cycles here, some in sales forecasting.

If business firms expect sales to rise they are apt to place orders to cover these rising sales, people observing rising sales leads to an expectation of further rises in sales.

So there are quite a number of mechanisms that operate in the inventory area which tend to make the American economy fluctuate fairly sharply. It is quite possible, for example, within a period of something like 6 months, for inventory accumulation to go from an accumulation at a $5 billion annual rate to a decumulation of inventory at the rate of $2 billion a year. Since this tends to be done just exactly at the wrong part of the business cycle, there is no question at all in my mind that this is a very strong contributing factor to the instability that we observe in the American economy.

The question as to what might be done about it is an extremely difficult one. I have some remarks to make along this line, but I don't want to talk too long at this particular point.

Representative REUSS. Why don't you tell us right now what you think should be done?

Mr. CHARLES HOLT. The first point I would like to make is that these relationships, as I have just indicated, are extremely important to the performance of the American economy.

The second point is that they have been studied all too little, and we need to learn a great deal more about them, particularly because their timing is important. For example, it is important to know how long it takes for an increase in sales to influence an increase in production. Mr. Robertson suggested that maybe 30 to 60 days would be required for business firms to change their forecasts. There are a lot of timelags involved in hiring and training people and getting raw materials and so on, to either increase or decrease a production rate.

It takes time for a disturbance on the economy to go around this loop from consumers to producers and back; we need to know a great deal more about how long it takes, how responsive various variables are and so on, and we can't really do an adequate job of suggesting what would improve the stability of the economy until we do a good deal more research in this area. The Government certainly has a very strong concern and interest in this area, but the research that is going on, directed specifically at this problem, is far short of what should be done considering its importance.

Look ahead at what might be done; take tax rates, for example. If we have a 2-year economic fluctuation, and if we choose to try to smooth this fluctuation out by changing tax rates, taxes would have to be increased for one year and then decreased the following year.

It is important how fast you can get this kind of legislation through Congress, and if we take too long it is quite obvious that we may end up having a tax cut at just exactly the wrong time.

We need to figure out ways in which we really can make corrective actions quickly and as automatically as possible. This is just not the kind of problem that is very well adapted to prolonged political debate, as to whether action needs to be taken.

There are things that business firms themselves are doing for their own profit position in terms of using operations research and computers and so on, to try to make their own operations more profitable.

In general, I think many of these will operate in the direction of improving the stability of the economy as a whole, but this is not obvious. A business firm may save money by making a faster response in correcting an inventory surplus that resulted from a forecast error, but it is not clear whether this fast response is going to make the economy more stable or less stable.

There are incentives that business firms now have not to fluctuate production and not to fluctuate inventory. One way that the Government might get business firms to pay more attention to these fluctuations would be to, let's say, give a tax credit to firms that resisted fluctuations in its production rate or tax credits for firms that resisted the temptation to fluctuate the placing of orders.

One of the key weaknesses in our present operation of the economy is in this area. Fluctuating sales are extremely costly for a business firm.

They can be absorbed by inventory fluctuations. But when inventory is high it ties up lots of working capital and storage costs are high. When inventory is low runout problems and bad customer service occurs, so wide fluctuations in inventory are undesirable for the business firm. One way to stop fluctuations in inventory is to have big fluctuations in production.

But big fluctuations in production are also expensive because of the hiring and firing, the overtime and idle time, and so on.

What is peculiar is that when it costs a business firm so much to respond to sales fluctuations that these costs are not taking into account in setting prices.

Business firms do not in general charge higher prices to customers that are capricious, and buy a large amount one day and nothing tomorrow. There are some possibilities that are certainly worth exploration for business firms themselves to try to give their customers an incentive to follow a more uniform purchasing policy that will make it easier for the supplier to operate his business on a more uniform basis. If this were done very broadly, I think not only would it stabilize the operations of individual firms, but it also would probably have healthy implications for the economy as a whole.

There is a large area for incentives that the Government might set up through tax credits that would try to stimulate business firms to operate their own production and inventory control policies in such ways that they contributed as little as possible to the amplification of fluctuations.

Just exactly what form these incentives might take would require a great deal of study. Business firms that did smooth their production might be rewarded for doing a good job, over and beyond the cost savings to the company directly. This reward would reflect the company's contribution to the general stability of business which would be beneficial to the community generally.

Then, of course, the other area is one that has been talked about a great deal, and that is direct action on the part of the Government influencing aggregate demand, changes in Government spending, changes in tax rates, changes in monetary policy, et cetera.

Now, changes in monetary policy can be quite fast, and they obviously have some influence in this inventory area. However, we don't know yet how influential the financial side is through working capital in influencing the inventory policies of business firms.

It is quite clear that there is a problem of changing Government spending fast so that you get the economic impact at the time you want it. If there are to be fast actions in the area of Government spending and taxation we clearly need to do some hard thinking about the delegation of power, how limited control over some of these things might be put in the hands of the Joint Economic Committee, let's say, which would be empowered to act fast. It is quite clear, I think, that the whole legislative machinery can't be expected to move fast enough and often enough. After all, Congress has lots of other business to take care of as well.

Thank you.

Representative REUSS. Thank you, Mr. Holt.

I know Mr. Fred Holt and Mr. Robertson probably have some comments to make.

But I would like to go on with the panel and ask Professor Modigliani to make his contribution.

STATEMENT OF FRANCO MODIGLIANI, PROFESSOR, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Mr. MODIGLIANI. Well, first of all, some of the things I wanted to say have been covered by Professor Holt which is not surprising since we have worked together a great deal so we know each others mind.

Under these conditions, the main thing I would like to do is to reiterate the importance of this problem area and the need for further research in this area, and therefore, also express my feeling that the committee has been doing a very useful thing in this last year by trying to collect and stimulate work in this area. I think the results of this effort have already paid some dividends although undoubtedly much more is needed.

I would like next to point out and stress even more than Mr. Darling perhaps has done, that the report of this task force on inventory fluctuations, price level changes, and economic growth which Mr. Darling summarized a little while ago is to be regarded indeed as extremely tentative, largely because this report deals with an area about which rather little thinking has been done so far; namely, the effect of inventory fluctuations on longrun growth and longrun behavior of the economy.

I think most economists have done a fair amount of thinking on the nature of inventory fluctuations, of which Professor Holt has just given a short summary account.

But not much has been done on the problem of inventory fluctuations in relation to longrun growth and price stability.

I think the task force report, therefore, ought to be seen as an explanatory document which is meant to stimulate thinking in this area and, perhaps challenge other economists so they will point out some of the errors we have made.

We do not necessarily believe that all that has been said here is right. I think we feel there is some plausibility to the argument, and

some evidence to support it, but by no means enough of either to use it at this point as a basis for policy, for instance.

I think many of the associations which are pointed out in the report, and exhibited in these various charts are really quite loose. Sometimes looking at charts like these can be somewhat misleading. You can see waves in each graph and it is very hard to tell whether the waves come at about the same time, whether one systematically leads the other, or whether it lags the other, whether there are any stable relations. These graphs in particular are dominated by the Korean war episode which imparts a very large bump common to all the series. This is because of the tremendous impact of the Korean war which is really an outside shock and ought to be treated as such.

If you look outside of that period you will find the associations which have been pointed out are not so striking, not so reliable, and not so systematic.

There is, of course, some plausibility to the argument that, on the whole, when we operate at a high level of utilization of capacity, then the superimposition of inventory fluctuations will tend to cause formation of backlogs; and increasing backlogs, which is an indication of demand in excess of supply, may tend to put pressure on prices.

However, I think it is interesting to observe that this association has not always occurred. There is in particular one period that always fascinates in the recent history of this country; namely, the period immediately following the first impact of the Korean war.

If you will look at what happened from the first quarter of 1951 through the peak of 1953, you will find that in that period we had very high rates of utilization of capacity. As you can see here, from panel C, utilization of capacity in this period has been as high as ever on the average, and extremely high in 1953.

Representative REUSS. You are indicating chart 4?

Mr. MODIGLIANI. Yes, chart 4 (which appears on p. 81).

Now, at the same time you observe that during this interval there were high backlogs and rising backlogs.

As long as these bars are positive it means the backlog is still rising, or getting larger. And yet if you look at what happened to prices in this chart, you will find——

Representative REUSS. You are now indicating chart 5 (which appears on p. 79).

Mr. MODIGLIANI. Yes. You will find this is a period in which price rises have been as small as almost anywhere in our recent experience. You see, this is the first quarter of 1951. Up to 1953 here, to the turn of 1953, this is a period of very small price rises in spite of the fact all the other conditions are present which the report says are usually associated with rising prices, namely, high capacity and large backlog and large accumulation of inventories. The accumulation was very large through 1952 and still fairly large in 1953.

So that indicates that there is no necessary association between these phenomena, and it is interesting to speculate why things worked out so well in that particular period, from, let's say, right after we digested the first impact of the Korean war, through 1953.

Perhaps it might be interesting to try to establish just what was special about that period, and how we managed that, and we might learn how to do similar things in the future.

Of course, there may be some special and nonrepetitive circumstances at work there.

The next point I would like to stress—and Mr. Holt has done this to some extent, in his reaction to Mr. Robertson and perhaps to Mr. Fred Holt's remarks—is that this problem of fluctuations in inventories really has nothing to do basically with capriciousness or perverseness of firms or their abusing their economic power.

It is really something which is built in, in a free enterprise system, if you like. It is one of the features that such an economy has. It is a consequence of the fact that you need to have inventories to support sales which means that whenever sales are rising there is a need for additional inventories. I believe Mr. Robertson is sort of sitting at a low level, the level of making decisions, so to speak. [Laughter.]

That is right; well, I think it is true. He is the operating person, he is the man who makes important decisions, and economists, on the other hand, sit on the top and make very unimportant decisions. [Laughter.]

Well, perhaps he sees mostly what affects his own private picture; he sees, of course, inventory accumulation and decumulation related to sales forecast errors. However, the important point is that many of the sales forecast errors do cancel out.

Some firms err in one direction, other firms in the other, but there are things that do not cancel out in the aggregate which we do see in this picture and that is why dealing with aggregates is important and relevant, you see that on the whole, after you cancel out individual errors you will still have the phenomenon that larger sales will require larger inventories. Therefore, you will have the additional need of production to fill additional inventory requirements which is superimposed on the change in final demand.

So this is essentially a mechanism which is built in, in a firm which is well-managed. As a matter of fact, the emphasis of the paper Professor Holt and I prepared for these hearings is precisely to stress the fact if you suppose the firm was managed very well, if the firm were minimizing costs which no one can object to, if they did that then even if they could forecast perfectly, they would still be led to this kind of accumulation and decumulation of inventories as their sales go up and down.

Now, given this circumstance, given the fact you know there is nothing perverse about this, this does make the problem of trying to smooth out these inventory cycles that much more difficult.

If it was a mean man doing it you might put him in jail. But this is no mean man, this is a perfectly natural response to a situation and, therefore, I believe the problem of smoothing these inventory cycles is really a very hard one, and I am not very optimistic that specific actions directed at this inventory cycle can be very successful.

It is certainly worth while to study the possibility of certain incentives. I think tax incentives may be a possibility. I think it is at least conceivable that tax incentives may help in inducing firms to carry more inventories in times of declining sales. It may be harder to dissuade them from building up inventories when they have additional sales and need this to service sales but they may be induced to carry more inventories at other times.

It should be observed that if you are going to stabilize production and income and employment this may require unstabilizing inventories to some extent. You see, if you want to maintain stable production in the face of a lull in sales what you have to do is build up inventories

and if you want to maintain stable production during a spurt of sales you have to draw down your inventory. Thus the most effective way of stabilizing production and employment would be to induce firms to fluctuate their inventories countercyclically, increasing them when demand is cyclically depressed and reducing them when demand is at its cyclical high. This goal may be hard to achieve. However, some improvement in stability could be obtained by merely reducing the present tendency of inventories to fluctuate cyclically in step with final demand. This would only require inducing firms to vary countercyclically their desired inventory-sales ratio. As suggested earlier, I think that appropriate tax incentives might be effective, at least in inducing firms to hold higher inventories in relation to sales at times of slack demand.

And if you succeed in getting them to willingly hold more inventories than they normally would in the down phase this will also serve to smooth out the up phase because you will have less need to accumulate inventories as sales rise to the extent that the inventories are already there. So, if you could work on one side, I think it could be to some extent effective on both sides.

Perhaps the last point I would like to make is not directly connected with this issue, it is connected with it because the title of our report speaks of the effect of fluctuations on economic growth.

I would like to indicate that I personally have serious reservations about all the great fuss made recently about increasing our rate of economic growth. I think there is really a great deal of confusion that can easily be generated between the justified concern with eliminating the present slack of the economy and the dubious concern with getting a more rapid rate of growth which presumably means getting the capacity ceiling of the economy to grow faster.

In other words, the level of activity and the rate of growth of income depend both on the extent to which the capacity of the economy increases, and the extent to which we utilize that capacity.

Now, I believe that in general our economic policy should concentrate on being sure that we utilize fully whatever capacity is available and not particularly worry about getting the ceiling to rise faster.

I believe there is very little that can be done, in fact, about changing the rate of growth, changing the slope of that capacity ceiling, and I do not particularly believe that smoothing inventory cycles would affect that. But it is, of course, true that if we can smooth out the inventory cycles we can stick closer to the capacity of the economy and, to this extent, we will just have more for everybody.

In other words, the important point is to utilize fully the manpower and facilities we have. This is really the important issue and I believe that we ought to have done more in recent years to do that. I think that our monetary policy has been quite weak in this respect and I think much of the blame for our having been so far away from the ceiling for the last 4 years falls on the monetary policy; that monetary policy is the first line of defense with fiscal policy coming in to the extent that monetary policy is not successful.

Well, I think this is my statement at the moment.

Representative REUSS. Thank you, Professor Modigliani.

Mrs. Griffiths?

Representative GRIFFITHS. I was just impressed with your suggestion that, the suggestion of both of you gentlemen, that we smooth out the inventory fluctuations by some type of Government action.

The thing that unnerved me was that we might substitute a manufacturers program for the farm program.

Mr. MODIGLIANI. Well, the kinds of things we are talking about in no way would involve price fixing, in no way would involve the Government buying things.

What we are thinking about are incentives to firms to hold larger inventories, for instance, in the form of tax concessions.

Some of these tax concessions can be so arranged that later on if the operation of the firm has been successful some of the loss of revenue can be recouped. The purpose of the concession is to reduce the risks, so if things go poorly the firm will not lose as much and if things go well then you can later on tap that revenue.

Representative GRIFFITHS. I would think that the effect would be that you would give a tax concession to hold a larger inventory, they would hold the inventory and they can't sell it and you would then have to buy the inventory, this would be the next thing and they would want the tax concession anyhow.

Mr. MODIGLIANI. I would hope we would not get into that position.

The purpose of the tax concession would be precisely to absorb a fair share of risk, but the risk is there and the residual risk is to be borne by the firm. The incentive, in other words, is to take somewhat of a chance. Presumably such tax incentive would be most operative on those firms for whom the risk of accumulation is relatively smaller. There are kinds of things which are sufficiently flexible, kinds of inputs which are sufficiently flexible, and with sufficiently wide use so you would not risk very much in accumulation and there is no great danger of obsolescence. So you can, therefore, by providing these incentives, induce this kind of accumulation where it hurts less, which is precisely the advantage of a general tax concession versus any specific measure.

Representative GRIFFITHS. But then you would have to limit the type of inventories you are talking about because when you start talking about the General Electric refrigerators, one refrigerator is not another.

Mr. MODIGLIANI. Absolutely, I would not think that you could, by this process, induce General Electric to hold more of the 1961 model of refrigerators; what I am thinking about is the possibility of holding larger stock of raw materials or goods in process.

I am thinking of intermediate producers who produce fairly standardized kinds of products.

I am quite aware as I indicated before, that, if you give this kind of tax concession you would expect different firms to take advantage of this to different extent.

Some firms could, I think, under small provocation be induced to hold larger inventories during a contraction, some other firms could not and I think you would just let firms decide whether the concession is sufficiently strong to induce them to do so.

Representative GRIFFITHS. Politically you would have the problem that you are helping, for instance, the steel companies, while you refuse to aid General Electric.

So that you would have some difficulties, I would think.

Mr. MODIGLIANI. May I just clarify this point?

The tax concession is general, it is only taking advantage of that that is up to the person.

Representative GRIFFITHS. Yes, but the tax concession would not be general on the inventory.

Mr. MODIGLIANI. Oh, yes. It would be general on the inventory.

Representative GRIFFITHS. We had just determined that you are not going to give it to General Electric for storing refrigerators.

Mr. MODIGLIANI. No; I am sorry. I think I have not made myself clear.

You give a general concession, for instance, in the form of writeoff of inventories which is available to anyone and I am saying if you are given this incentive some firms will find it desirable to take advantage of it and some firms will not, and I would think General Electric would not find it advantageous to take advantage of this with respect to the storage of very finished product styled goods, things which are dated.

Representative GRIFFITHS. Then I think you have the objection that they don't take advantage of it, and if they won't take advantage of it in reality it is not actually given for them.

I would think you would have great difficulties with such problems.

I would like to ask also, Mr. Holt, how do you react to the statement of Mr. Charles Holt on the cost of suddenly increasing the sales? How great is the cost?

Mr. FRED HOLT. The cost of increasing sales.

Representative GRIFFITHS. Increasing your manufacture of refrigerators.

Does this have an effect?

Mr. FRED HOLT. Well, there are inherent costs any time you change your production rate.

Normally, a reduction in production rate presents a greater problem—let me just outline some of the problems.

Any time you change your production rate it means you have to retrain people to do that job. You may have a less efficient balance of how their labor, their efforts are used.

If things are going down, well, any time you make a change it means a dislocation of your labor force which means because people operate on the basis of seniority they have to change jobs.

Therefore, you present two things which worries us a great deal, quality—in other words, the person is doing a different job than he did yesterday. This endangers the quality he produces. Then there are fixed costs. When you take people off, there are certain unemployment compensation liabilities that you incur, and if you change the production rate rapidly, you may have material that you have on firm order and there are cancellation charges, so there are costs of change and I think in a general way, the thing you could say is that if there were any way that we could keep our production steady and preferably upward and onward we would love that, but there are costs, to answer your question, and it is different on every line of products and we have to evaluate it based on rate of production.

Representative GRIFFITHS. If I may ask you if you are not giving away trade secrets, how do you determine what your production is going to be on a new item?

Mr. FRED HOLT. Well——

Representative GRIFFITHS. How do you estimate?

Mr. FRED HOLT. We have different ways of estimating it. It depends on the product. If it is a variation—quite often—let me

give you an example—we came out several years ago with a two-door refrigerator, you may recall, that had a freezer compartment up at the top. Prior to that time they had one-door refrigerators and from customer surveys we made, we went around, going to talk to housewives by having professionals go out and talk to them, it seemed interest was great in showing our dealers.

So we compared it with other new products we put out we thought had similar impact and we tried to estimate the rate at which those sales would increase on a weekly basis and then we made sure we set our production rates on that way, and, of course, I think on a new product you have to readjust the rate constantly until you get up to a proper rate.

Representative GRIFFITHS. Thank you.

Representative REUSS. Senator Pell?

Senator PELL. Professor Modigliani, I was wondering why a company would not take advantage of any of these tax benefits that they could have?

You said some would and some would not.

Mr. MODIGLIANI. Well, the reason is that the kind of tax incentive I am thinking about essentially amounts to reducing the direct cost of carrying inventories and possibly making that cost negative.

Now, however, we are dealing essentially with the cost of the money which is tied up in this form, the cost of storage, the cost of insurance. But there are other kinds of costs associated with holding inventories which may vary greatly, per dollars' worth of inventory, between different products, and particularly the cost of obsolescence.

In other words, you put in inventory something today which is today worth a hundred and which may tomorrow be worth 70 because it has gone out of fashion and you must sell it at a low price.

Under these conditions you have to take into account the obsolescence costs, which is partly in the nature of a risk—you are not quite sure how large it will be—in addition to the direct costs of carrying inventories.

If we make the direct cost of carrying inventories small or negative then those firms for which these other costs and risks are small may find it advantageous to require larger inventories. Those for which these other costs are large may not.

Furthermore, within the firm there will be different lines and some lines will be such that you would find it profitable to take advantage of it, while for other lines you would not.

Or you might want to take advantage of it in your raw material or in process inventory and not other inventory.

Senator PELL. In other words, it is a question of arithmetic?

Mr. MODIGLIANI. Profitability.

Senator PELL. That is right.

Mr. Robertson, I was wondering what your thought would be about the possibility of applying different credit controls where those companies having heavy inventories would find money more expensive, and those that had low inventories would find money cheaper.

Would such a program be possible or would it be, as Mrs. Griffiths pointed out, almost impossible to administer like a farm program or a manufacturing program?

Mr. ROBERTSON. Are you talking about different levels of interest rates?

Senator PELL. Right.

Mr. ROBERTSON. I don't think, sir, that would have any impact at all as interest charges are not the predominant feature in the decision to hold stocks. For example, the Radcliffe committee in England found little relationship between interest rates and investment in stocks.

Senator PELL. You don't think if General Electric had to pay, well, they wouldn't, but smaller companies, if they had to pay 7 percent and another company had to pay 4 percent that the one who had to pay 4 percent might produce more goods and produce larger inventories?

Mr. ROBERTSON. I don't think so. Low interest charges would not induce a company to build stocks unless business conditions warranted it.

Senator PELL. There would be no relationship?

Mr. ROBERTSON. The level of interest rates is not an important factor in the holding of stocks. The anticipated rate of sales is a much more vital consideration in inventory policy.

Mr. CHARLES HOLT. The cost of holding inventory is something in the order of 30 or 40 percent a year so the changes in interest rate are relatively unimportant which is not to say they don't have some influence.

Senator PELL. Thank you very much.

That is all.

Representative REUSS. Mr. Robertson, would you agree with the following statement which I think stems from what you said before: If the Congress and the executive branch and the Nation as a whole did their duty under the Employment Act of 1946 and we had maximum employment, maximum growth, and maximum dollar stability, the inventory problem would tend to take care of itself. With better communications, electronic data processing, and other modern inventions inventories would tend to be about what they needed to be in order to carry their level of production, and they would not require any special attention.

Would you agree with what I have just said?

Mr. ROBERTSON. Stocks will always fluctuate because, as I indicated in my opening statement, output is rarely adjusted immediately to a changed rate of sales. Thus while the use of new forecasting techniques and the application of electronic computers should tend to mitigate inventory fluctuations such movements are inherent in the system and are unlikely to be entirely eliminated. I would certainly agree with you, however, that this is a problem which should be allowed to take care of itself as any corrective action may prove to be extremely difficult and unnecessary.

Representative REUSS. Would those moderate fluctuations you are describing, even under full employment conditions, represent a danger to the economy?

Mr. ROBERTSON. No, sir. There is probably a greater danger to the economy in trying to correct or eliminate the inventory mechanism which in any event is self-correcting as stocks are not accumulated or liquidated for an indefinite period of time. I would also like to suggest that these postwar waves of inventory changes have been relatively minor when viewed against the background of the rapid economic growth rate during much of the 1950's. The early sixties moreover,

bear little resemblance to the last decade and not only is it likely that inventory behavior will be very different from the postwar experience. But we may have to face economic problems other than inventory fluctuations.

Mr. CHARLES HOLT. You are saying then, you expect these types of inventory fluctuations to continue, it is just they are relatively unimportant?

You don't expect them to fade away?

Mr. ROBERTSON. No, I don't expect them to fade away.

Representative REUSS. I would like, perhaps, to ask the panel generally, whether they think a Government policy of trying to level out inventories is fruitful in the present state of the art, and whether we agree to concentrate on the general goals of maximum employment, growth, and purchasing power. To what extent, in short, are excessive inventory fluctuations a symptom rather than a cause of the economy's not moving forward as fast as the Employment Act of 1946 would like to see it move?

Mr. Charles Holt and Mr. Modigliani, for example, suggested some ad hoc remedies for inventory fluctuations. I would like an evaluation of whether that really is as fruitful an approach as tackling the basic causes of the economic cycle?

Mr. CHARLES HOLT. Let me say that I think there are two mechanisms that contribute most to the instability of the American economy.

One is the so-called capital goods accelerator and the other is the inventory accelerator.

Both of these, I think, are problem areas but it is the inventory accelerator that tends to make the economy fluctuate with these fairly sharp and fast fluctuations of the order of 2 or 3 years. I agree that these constitute a relatively mild problem. However, we are still talking about many billions of dollars that the American economy is losing by not doing something about this type of fluctuation. I think the sets of relationships that we have been discussing this morning are extremely important in causing the American economy to have a low degree of stability so that when a disturbance does occur the economy tends to have an exaggerated and amplified response to it.

The knowledge we have in this area is quite small. I would like to review the list of all the papers that have been prepared for this committee, but I am almost willing to bet that all of the research that was reported here, none of these papers have really gotten around even to studying the question of policy; that is, what the Government ought to do.

In other words, we are still at the stage of trying to find out what the relationships are, and we need much more research on that area, and I think it is a shame that none of the research that has gone on in this area has been actually pushed by the Government. We need more knowledge, the Government needs more knowledge, and the Government really hasn't been pushing us as economists to get the job done nor has the Government financed any significant part of the research that has been done.

I think that the reason we can't give Mrs. Griffiths very good answers—she puts her finger very accurately on a political problem, if we offer an incentive scheme that appealed only to some industries

and not to all, this is obviously difficult to get passed. One of the criteria that we ought to take into account in trying to devise a workable tax incentive scheme is that it should have some general applicability and broad appeal—is that we just have not done anywhere near the study that needs to be done in order to give good answers to policy questions.

I would end by saying, I think there is a problem and we ought to do a lot more about it than we have been doing.

Representative REUSS. You have mentioned two factors which you consider important in the business cycle (1) the rate of capital investment, and (2) the rate of inventory accumulation or liquidation.

Certainly most of the people in this room, I think, would agree that the first, namely the rate of capital investment, is not only a result of the business cycle but it is also, in part, a cause of the business cycle. If interest rates are high or if the tax policy is such as not to favor investment, businessmen invest less and this may contribute to a recession. The opposite phenomenon is also true.

I think there would be general agreement that capital investment is both a result and a cause of the cycle.

However, I still need to be convinced that inventories are not just a result of the business cycle, and that they are a cause of cyclical fluctuations in any very important measure. This then raises the question whether you can do very much on inventory accumulation and liquidation directly.

I would like to hear your comments on this.

Mr. FRED HOLT. I think there is a tendency to oversimplify inventories and inventory problems.

I think that is something we do in our business on a day-by-day basis. We get people together and say, your inventories are not right, they are this, that, or the other. Actually I think inventories are made up in every place of a great number of models and we have to look at the models that are involved to make sure we are taking care of our inventories, the ability to serve our customers. I think as you tend to look at the inventories on a national basis and attempt to find some way that you could solve the problem, and I assume the problem we are talking about is recession kind of thing, then you have got to take into account that you are looking at aggregate figures here of inventories when a lot of them get out of line, and then you have a recession.

Now, if you come up with an inventory kind of solution, you have got to keep in mind that quite often what we think of as a recession is displaced from what the country thinks of as a recession, and I think the people in our plant think of a recession when they are involved, not when the country is involved.

So one of the big problems that faces you, I don't know what the answer is, if you try to work out any solution that encourages people to build inventories when they have too many, you have got to take into account that it will be varying years for varying kinds of manufacturers and it presents some rather serious problems.

Of course, we would have no inventory problem if our demand stayed steady, because I, like you, think it is a result, and I can't deny that any time we have a change in demand, inventories do have some amplification effect.

But I think if you would look at any other elements of business with the good, we have some bad, and it is a question of whether the good offsets the bad.

Representative GRIFFITHS. Wouldn't the building of an inventory, for instance, of refrigerators, have the tendency to depress the market in the future?

Mr. FRED HOLT. We have a very depressed market at the moment. Yes; in general, in our particular case, the price of refrigerators has gone down continually for a long number of years.

In fact, I recall seeing the other day some Department of Commerce statistics, I think, showing what people bought in their lifetime and it showed the price of refrigerators having gone down 25.8 percent since 1955.

In 1955–61, and I think the only other things that have gone down that people have bought were eggs, 15 percent, so I guess we are right there with the chicken.

So the price, if you get too many in stock, in fact I recall back in the 1957–58 period, in 1958 the sale of refrigerators dropped off a little bit and what we found was if we would have kept building them, the customers changed what they wanted, they decided they wanted a two-door instead of a single-door refrigerator, I think you have to be careful what you build because if you build the customer has to pay for it.

Representative GRIFFITHS. When you are using this, therefore, in building up your inventory, you have really been entrapped in hurting your own market.

So the only thing you can do is come in and ask us to buy the refrigerators and it will be like the wheat.

Mr. FRED HOLT. Yes. [Laughter.]

Senator PELL. What will be the cost of storing these refrigerators, the estimate was given of 30 or 40 percent.

Mr. FRED HOLT. A typical refrigerator is 2 feet wide and 2 feet deep, 6 feet tall and weighs about 250 pounds, and I can't just tell you the exact figure.

Senator PELL. Roughly what do you figure in General Electric would be the cost of storing refrigerators, keeping them in inventory per annum?

Mr. FRED HOLT. I have to be careful how I answer that question because there is the simple thing like the cost of the floorspace and the cost of moving it, maybe it costs us 50 cents every time we pick it up and move it from place to place and depending on the cost of the structure we put it in depends on how much it costs us but the real problem that scares us is what it would cost if somebody started building a different model or maybe the Europeans, as an example, started coming out with a strange and exotic model, then it could easily run 30 or 40 percent. I am not trying to evade it but you see the problem.

Senator PELL. Yes.

You don't have a rough rule of thumb which your company uses?

Mr. FRED HOLT. When we do it on a short-term basis we can determine what it is but we don't attempt to say every one we put in stock has a 30-percent risk on it.

I think if it runs beyond a certain period of time, so it becomes a dangerous one, in other words, if it runs over our normal inventory-

sales relationships then we know the risk is very great, and the price of an excess stock could easily be 20 percent overnight, it could drop that quick in value, and, of course, it can drop to the other figure he spoke of, but that is the kind of risk, it depends on the model.

Senator PELL. Thank you.

Mr. MODIGLIANI. Could I perhaps answer your question on the relevance of inventory cycles, and on the desirability of concentrating on them?

Representative REUSS. Yes.

Mr. MODIGLIANI. Let me first summarize what I want to say; namely, that I think in fact inventory fluctuations are a very important source of fluctuation in our economy, are now and have been for a long time. I think the reference of Mr. Robertson to the effect that we had a worse depression in the 1930's is true. But that was a sporadic and unique event. If you left out this period, you would find that fluctuations which looks like the postwar ones and seem, to be connected with inventories, go way back in our history.

I think it is true that in the postwar period inventory investment has been the most volatile element in our aggregate demand.

You referred to a comparison of inventories, investments in inventories with investments in fixed capital. I have some figures here that I jotted down that indicate in every year from 1946 to 1961, with the possible exception of one, the change in inventory investment was as large or larger—and sometimes dramatically larger—than the change in investment in fixed capital.

So I think it is fair to say that more fluctuations have come in fact from inventory investment than from fixed capital.

Furthermore, I think it is important to realize that the nature of inventory investments is such they do not only contribute to pushing things up when they are going up but they also have built in themselves, in their own nature, a turning point.

Perhaps I may refer you to a figure 4 in the paper that Professor Holt and myself have prepared for this hearing, it is in part 2, and the figure is on page 27, where we show the response of production to a one-time change in sales.

Suppose sales change just once, and then ask what happens to production. You will find production will describe a cycle in response to a single step, re increase, in sales. Even though sales do not have a cycle, but just go up once, the response of production is first up and then down. And the reason is simple. When the sales have gone up, in addition to increasing production, to supply the larger sales you must also temporarily increase production to provide additional inventories. But that is only needed as long as you are accumulating the inventories for a larger level of sales, once you have produced enough inventory you can turn off that production and then production will fall. So you have a cyclical response.

So, my feeling is that the inventory cycle has been a very important causative element in our economy, and that it would be indeed worthwhile to consider actions related to it specifically.

Now, the only reason I am not pushing this very hard is because I believe it is an extremely hard thing to do. It is in a sense easier to deal with other aspects of economic instability. The problem of being away from the capacity ceiling, can in principle be handled in

an easier way than it is possible to devise policies to deal specifically with the inventory cycle.

For this reason I say I think it is worthwhile to pursue the study of this possibility although I am not very optimistic that anything concrete will come out of it.

Representative REUSS. Thank you.

Dr. Darling, do you have any questions?

Mr. DARLING. I have just one question I would like to ask.

Suppose we were able, through better management of fiscal policy, to raise the average rate of utilization of capacity. In that case, would fluctuations of inventory investment be larger and would we be back to a severer problem, maybe more like the problem we had during the middle fifties? Does any panelist wish to comment on the proposition that pushing the economy up back closer to a capacity ceiling would induce wider swings in inventory investment.

Mr. FRED HOLT. I don't know what your history by industries shows as to statistics on capacity, but I would imagine that in a growing economy like ours we are going to constantly be taking our capacity up anyway, I am sure from what you say, the closer you get to capacity, if you had long leadtimes in your business.

Mr. DARLING. That is what I am trying to get at. Supply deterioration during expansions would tend to be more extensive and more severe, wouldn't it?

At least that is a proposition I am asking you to comment on. When you get up close to capacity and then wherever you do get an upswing you will have this leadtime running out, delivery periods extending, and, therefore, a higher inventory objective. I am not talking about refrigerators but talking about the intermediate goods that go into production, especially those that come from the durable sectors of the economy which is a point I should have stressed earlier this morning.

Mr. MODIGLIANI. Well, I guess my comment would be that this is plausible but I don't think that the evidence is at the present very clear on this point.

In terms of the chart which is there labeled 4, I would say that it is not clear to me that the last swing in inventory, the latest one, 1958–60, is really different in character from the previous one, even though the rate of utilization of capacity is lower.

So it is true, of course, that the building up and building down of backlog will be smaller. This you would definitely expect to happen, and as is very clear from the picture, did happen. But I am not convinced this implies a moderation of the accumulation and decumulation of inventories.

Representative REUSS. Thank you.

Mr. CHARLES HOLT. I would like to comment on the question that you raised as to whether inventories are really a cause or an effect in terms of economic fluctuation.

This is, as you know, a very difficult question, and——

Representative REUSS. They certainly are an effect. The question is to what extent are they also a cause?

Mr. CHARLES HOLT. That is right.

The availability of electronic computers gives us a chance to study this sort of question. If this were a problem in laboratory experimentation what we would do is cut the nerve and then see what

happened; in other words, we would hold inventories constant and then we would let the economy run and see what fluctuations would occur.

But since we can't do that in the American economy, we set up a mathematical model of the economy on an electronic computer and see how the economic model behaves.

Experiments on such economic models can be extremely illuminating but, of course, the question is always whether the model is behaving as the economy would. Therefore, we have to do a lot more study before we can be quite confident of it.

Representative REUSS. Thank you.

Any further questions?

Thank you very much, gentlemen, we appreciate the significant contributions you have made.

We will now stand adjourned until 10 o'clock tomorrow morning in this place where the subcommittee will hear from Assistant Secretary of Defense Hitch and from Mr. Wiedenbaum, of the Boeing Co.

The subcommittee will now stand adjourned.

(Whereupon, at 11:50 a.m., the subcommittee stood in recess, to reconvene at 10 a.m., Thursday, July 12, 1962.)

INVENTORY FLUCTUATIONS AND ECONOMIC STABILIZATION

THURSDAY, JULY 12, 1962

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON ECONOMIC STABILIZATION,
AUTOMATION, AND ENERGY RESOURCES
OF THE JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee of the joint committee met, pursuant to recess, at 10 a.m., in room 304, Old House Office Building, Hon. Henry S. Reuss presiding.

Present: Representatives Reuss, Griffiths, Widnall, and Senator Pell.

Also present: William Summers Johnson, executive director; John R. Stark, clerk; Paul G. Darling, economist; and H. D. Gewehr, research assistant.

Representative REUSS. The Subcommittee on Economic Stabilization, Automation, and Energy Resources of the Joint Economic Committee will be in order.

We are privileged to have with us this morning Assistant Secretary of Defense Charles Hitch who, in response to our request, has prepared a paper with accompanying data on the subject of inventories.

Mr. Hitch, we are very glad to have you here, and would you proceed either to read your statement or in any other way that you would like.

STATEMENT OF HON. CHARLES J. HITCH, ASSISTANT SECRETARY OF DEFENSE

Mr. HITCH. Mr. Chairman and members of the committee, I will proceed to read my statement, and I would be happy to have you interrupt with questions at any time.

Representative REUSS. I think since there are considerable supporting documents which you obviously are not going to read in full, perhaps we had better receive into evidence your entire statement, without objection, and have you proceed as you wish.

Mr. HITCH. Yes, sir.

In your letter inviting me to appear here today you asked me to discuss:

First, the possible connection between variations in defense inventories and rates of activity in the private sector of the economy.

Second, the effects of variations in Defense Department procurement on inventories held by defense contractors and inventory policies.

Third, the feasibility of devising a flexible Defense Department inventory policy which would harmonize with the goal of economic stability.

Accordingly, I have divided my statement into two principal parts, the first dealing with inventories held by the Defense Department and the second with inventories held by defense contractors. The question of policy can best be discussed in the context of the pertinent data in each of these parts.

Attached to this statement is a set of tables and charts which presents the available data which I believe would be useful to your inquiry. I will be referring to them by number as I proceed through my statement.

In Professor Darling's memorandum attached to the letter it was suggested that an analysis of quarterly changes in Department of Defense inventories, over the last 10 years or so, would be helpful in tracing past policies and in suggesting future policies. Unfortunately, such data are not available. As the members of this committee may know, defensewide reporting of inventories in monetary terms is a rather recent achievement. Although the Department of the Navy had been accounting for its inventories in dollars since 1908, the Army and Air Force did not start until 1953, except for relatively small amounts of inventories held in the stock funds. The Air Force instituted its first stock fund in 1950 and the Army in 1951, but these were quite small, and even in the Navy, financial accounting for property, other than in stock funds, was greatly in arrears and quite incomplete.

The Army and Air Force as well as the Navy, of course, did maintain inventory stock records, but only in physical terms, by item. Item data are essential for many functions, including requirements determination, development of procurement programs, distribution and redistribution of stocks, et cetera. But management at the higher levels cannot deal with the literally millions of items held in Defense Department inventories unless they are classified and summarized in meaningful categories, including functional ones, and valued in dollars. Only then can general overages and shortages be detected and the necessary corrective actions taken by the higher levels of management.

This need was well recognized by the authors of the 1949 amendments to the National Security Act of 1947, which added title IV to that act. Among the many provisions dealing with the establishment of uniform budgeting and fiscal procedures and organization in the Department of Defense, title IV, in section 410, also required that—

> The Secretary of Defense shall cause property records to be maintained in the three military departments, so far as practicable, on both a quantitative and monetary basis, under regulations which he shall prescribe. Such property records shall include the fixed property, installations, and major items of equipment as well as the supplies, materials, and equipment held in store by the armed services. The Secretary shall report annually thereon to the President and the Congress.

However, it was not until 1955 that the first report, presenting data as of December 31, 1954, was submitted. This, incidentally, was the first time a comprehensive inventory of real property, even in physical terms, had ever been taken by the Defense Department. The development of a defensewide system of monetary accounting

for real and personal property inventories was begun soon after the enactment of title IV, but the Korean war intervened and it was only after the conflict ended that real progress was made in instituting the new system.

This progress was no doubt accelerated by the House resolution, adopted in January 1955, which proposed a special committee of the Congress to investigate public property and to make an inventory and appraisal of all properties owned by the U.S. Government. The work was immediately undertaken by the House Committee on Government Operations, on which I note Mr. Reuss has served since that time.

To meet the requirements of the Government Operations Committee, a number of modifications were made in the Defense Department's report. These changes were mostly of a type to facilitate the consolidation of the Defense Department's report with that of the other departments and agencies of the Government. Thus, the Defense Department's second report, on inventories as of June 30, 1955, became part of the Government Operations Committee's first annual report on the real and personal property holdings of the U.S. Government, which was published in March 1956. The committee has published an annual report every year since.

The Department of Defense for a time also published a semiannual inventory report as of December 31 of each year. Because of the heavy workload involved it was decided to drop the semiannual report. Thus, comprehensive data on inventories are available only annually for the period beginning June 30, 1955, with but a few exceptions which I will point out later, as I go along.

Chart 1 of the set of charts attached to my statement, presents a summary of the property holdings of the Department of Defense at the end of each fiscal year, 1955 through 1961. The growth in inventories from 1955 through 1957 reflects in part more complete coverage; for example, the value of construction in progress was not reflected in the inventory until 1957. As can be seen from this chart, real property holdings have increased steadily over the years as new acquisitions exceeded the value of property disposed.

Chart 2 presents a more detailed picture of our personal property holdings. Here, too, refinements have been made over the years. For example, the plant equipment category in 1955 included only the value of machine tools. Other production equipment was added in 1956, and other plant equipment in 1961. The increase of $1.9 billion in plant equipment in 1961 is simply the result of a reclassification of plant equipment at Navy shore installations from the "equipment in use" category to the "plant equipment" category. Also, in 1961, for the first time, Government-owned inventories held by Air Force contractors under cost-reimbursement contracts were included in the personal property inventory, as shown in chart 2. We have yet to add such inventories held by Army and Navy contractors, although we propose to do so next year. Beginning in 1958, excess inventories have been reported separately.

While supply system inventories have been steadily declining since 1957, inventories of weapons and other equipment in use continue to grow. This is shown in greater detail in chart 3, Weapons and Other Military Equipment in Use. The apparent drop in the total for 1961 is, as I mentioned earlier, a result of reclassification of certain

Navy equipment. On a comparable basis, the 1961 total would be about $1.3 billion higher than 1960. The sharp drop in Navy ships from 1955 to 1956 reflects the exclusion from the inventory accounts of ships lost in World War II, the value of which up to that time had been included in the inventory figures.

It is apparent from this chart that the bulk of the weapons and other military equipment in use consists of ships, aircraft, and missiles. Although the number of ships and aircraft in the inventory has been declining for many years, the cost per unit has increased even faster with the result that the total value of the inventory has risen.

However, because the amount of equipment in use is primarily associated with the size and composition of the military forces, the inventory category of principal interest to this inquiry is, of course, the supply system inventories. Chart 4 shows a breakdown of these inventories by purpose or, as we call it in the Defense Department, by inventory strata. The unstratified stocks, shown at the top of each bar, represent inventories which have not yet been classified. This unclassified residual has been gradually reduced over the years and now amounts to about $1.8 billion. The claimant stocks, shown for the period 1955 through 1959, simply represent inventories held by one service on behalf of another service. This class was eliminated in 1960 and such stocks are now recorded as part of the inventories of the owning service. The next stratum is excess stocks. These are inventories which have been declared surplus by one of the military departments and which are awaiting disposition. The next stratum is contingency retention stocks. These are inventories excess to our present requirements but which are deemed worth holding against unforeseen contingencies. The economic retention stocks represent inventories in long supply but which are more economical to hold than to replace at a later time. The stratum, mobilization reserve stocks, is self-explanatory. These are the inventories that we would use to support combat operations in the first few months of a war. This brings us to the last category or stratum, peacetime operating stocks, which are the inventories required to support the forces in peacetime. For example, peacetime training ammunition is included in the peacetime operating stocks while ammunition required for combat is included in the mobilization reserve stocks. Since current procurement is made against mobilization reserve and peacetime operating inventory requirements, these two strata are particularly germane to the committee's interest.

For internal management purposes, our objective is, of course, to reduce the peacetime operating stocks to the lowest possible level consistent with the adequate support of our forces. Thus there is constant pressure on the inventory managers to cleanse their peacetime operating stocks of all excesses. The sharp drop in this category from 1957 to 1958 was in large part the direct result of the austerity measures adopted by the Defense Department in the summer of 1957 in connection with its efforts to reduce military expenditures. I will discuss these efforts more fully in connection with the contractor inventories. But the immediate effect on inventories held directly by the Defense Department was the reclassification of billions of dollars of peacetime inventories to the excess category, as shown on chart 4, as well as a reduction in new procurement.

The full effect of this shift is not reflected in chart 4 since the disposition of excess property in 1958 was also increased, as shown on chart 5. The rate of disposal increased markedly in 1959, thus sharply reducing excess stocks by the end of that year and again in 1960.

Table 5A shows the beginning and ending inventories of worldwide excess and surplus stock for the entire Department of Defense together with the gross dispositions for the years 1957 through 1962.

Peacetime operating stocks gradually increased from 1958 through 1960 and declined in 1961. Data are not yet available for 1962 so that we do not know the effect of the force buildup during the last fiscal year on the supply system inventories. Mobilization reserve stocks have remained fairly constant since 1956. But we still have considerable holdings of economic retention stocks. There is, of course, a constant shift of stocks from one stratum to another as new weapons and equipment enter the inventories and old weapons and equipment are eliminated.

The supply system inventories include weapons and military equipment as well as spare parts and other consumables, such as ammunition, medical supplies, et cetera. Most of these stocks are subject to fairly rapid technical obsolescence and therefore do not lend themselves very readily to a flexible inventory policy.

A portion of the supply system inventory, however, consists of general supply items such as automotive spares, food, clothing, lumber, petroleum products, et cetera. These items, for the most part, are financed in the stock funds of the four military services.

The stock funds, as you know, are revolving funds designed to finance the acquisition and storage of general supply items. Chart 6 depicts the trend of stock fund inventories from 1955 through 1961. As can be seen from this chart, after the initial buildup resulting from the expansion in coverage of the stock fund, stock fund inventories have been reduced from a peak of almost $11 billion in 1957 to less than $6½ billion at the end of 1961. Thus, the stock fund inventories now constitute less than one-sixth of the total supply system inventories.

These inventories are also classified by inventory strata. The peacetime operating inventories, as you see from the chart, have been fairly stable since 1958. The reductions have been made in the other strata, including the mobilization reserves which have been more closely tailored to the requirements. Excess stocks and economic retention stocks have been greatly reduced since 1957. Indeed, one of the virtues of the stock fund is that it exerts a strong supply discipline on the inventory managers to reduce inventories to the minimum required levels.

Unfortunately, quarterly stock fund data are readily available only for the Navy and the Marine Corps in the 1955–61 period. As shown on the next chart, No. 7, where we have the Navy stock fund on top and the Marine Corps on the bottom, the sharp increases in Navy stock fund inventories, in 1956–57 and in 1959, both reflect expansions in coverage of the stock fund. But aside from the increases in coverage, there has been a steady decrease throughout this entire period in Navy stock fund inventories. This trend is in accord with our supply objective—to maintain the minimum stocks commensurate with the adequate support of the forces. The record of the Marine Corps stock fund is quite similar—a gradual increase in coverage is offset by a decrease in stock levels.

Included in the stock funds are the commodity single manager programs now consolidated in the new Defense Supply Agency. These programs encompass for the most part common items of supply at wholesale level, notably food, clothing, and medical supplies, as shown on chart 8. More recently, in 1961, industrial and general supplies were added to the single manager program, and in 1962 construction supplies and packaged petroleum products were brought into the program.

Chart 9 shows subsistence inventories by strata for the years 1957 through 1962. The rise in 1962 is caused by the increase in forces during that fiscal year. Chart 10 shows the same information for medical supplies. Here, you will note that mobilization reserve stocks have been more closely tailored to the requirements and total inventories have been steadily reduced since 1957. The largest category of single manager stocks is clothing and textiles, shown on chart 11. Here, too, there has been a steady reduction in inventories. You will note in particular, economic retentions stocks have been pretty well worked off.

The next three charts, 12, 13, and 14, provide inventory data by quarters for subsistence, medical, and clothing and textiles. The fluctuations in subsistence inventory shown in chart 12 are caused by seasonal factors. It is built up beginning in fall and it works down beginning in the spring of each year. The unusually large increase in 1962 is, as I mentioned earlier, the result of the force buildup. The quarterly data for medical supplies, on the next chart, show a steady downward trend, as do the data for clothing and textiles, on the next chart. The leveling of textile inventories in 1962 is, again, related to the force buildup which commenced in the fall of 1961.

As in the case of the annual data, the quarterly data for subsistence, medical supplies, and clothing and textiles show no relationship to the business cycle and no effect of the actions taken in late 1957 and early 1958 and in 1961 to accelerate Defense Department procurement. In fact, none of the available inventory data I have reviewed show any visible effects of the procurement accelerations. Any increases which may have resulted from those actions have been more than offset by the long-term effort to reduce inventories.

The question still remains: Would it be feasible to adopt a flexible inventory policy which could be harmonized with the goal of economic stability?

As we have seen, such a policy would be applicable only to a small part of the total Department of Defense inventory aggregating some $158 billion. It would not be applicable to real property, construction in progress, weapons and other equipment in use, or plant equipment which together account for more than two-thirds of the total. These inventories are mostly long leadtime items or are closely dependent on the force requirements.

A large part of the supply system inventory is composed of weapons, ammunition, and equipment which must be closely geared to military requirements, equipping schedules, maintenance of the production bases, and of spare parts and components which are subject to rapid technical obsolescence.

This leaves an area of general supplies, particularly such common items as food, clothing, medical, and automotive supplies, et cetera, generally managed in the stock funds. Thus, we are talking at most

about $6½ billion worth of inventories. But, even these inventories have not yet been brought down, in our opinion, to their proper levels in relation to requirements. As Secretary McNamara announced last week, we are now engaged in a major effort to achieve this objective within the next few years. Until this is done, we should think very seriously about the consequences of introducing new criteria unrelated to the management needs of the Department, as desirable as they might be from a broader economic point of view.

But even if a flexible inventory policy were deemed desirable later on, its contribution to economic stabilization would, of necessity, be rather modest. For example, a 10-percent increase in all stock fund inventories would mean a one-time increase in procurement of about $650 million. Furthermore, special funds would have to be provided by the Congress to finance the extra inventory, and this would require a thorough understanding and approval of the policy by the Congress. It would also complicate the problem of timing, unless the Congress were to provide a special contingency fund for that purpose, because our budgets are made up a long time in advance of the year in which the funds are spent.

I would now like to turn to the second part of my statement, the effect of variations in Defense Department procurement on inventories held by defense contractors and the policies related thereto.

Obviously, the industry segment most affected by defense procurement is the durable goods industries. Accordingly, it may be well to start this part of the discussion with a look at inventories in the durable goods industries. Shown on chart 15 are the seasonally unadjusted figures for the end of each quarter from 1953 through the first quarter of 1962. This is the dotted line at the top of the chart, durable goods industries inventories in the whole economy.

Unfortunately, there is no existing body of data which adequately describes "defense" industry as such. However, the aircraft and parts industry, because it is so heavily engaged in production for the Government, could well be used to characterize defense industry in general. Accordingly, we have shown on chart 15 inventories in the aircraft and parts industry. I just call your attention to the fact, the scales are completely different. For the durable goods industry the scale is on the left and for aircraft and parts the scale is on the right. The scale of aircraft and parts is about one-tenth that of the durable goods industry. You will note that in 1953 the increase in durable goods inventories was accompanied by an increase in aircraft and parts inventories. But in 1954, when durable goods inventories declined sharply, aircraft and parts inventories remained fairly stable. Durable goods inventories began to rise at the end of 1954 but it was not until the end of 1955 that aircraft and parts inventories resumed their rise.

It is interesting to note that the decline in durable goods inventories in 1957, a very steep decline, preceded the decline in aircraft and parts inventories. In the last quarter of 1958 both the durable goods and aircraft and parts industries' inventories began to rise, but, as the recovery continued into 1959, the rise in the durable goods inventories became much more rapid. Both durable goods and aircraft and parts inventories declined during the second half of 1960 through the first half of 1961. However, the most recent rise in durable goods inventories was not accompanied by a rise in aircraft and parts in-

ventories, and I think the reason was there were not enough aircraft in the accelerated procurement program of the Defense Department last year to offset the bomber models going out of production.

About three-quarters of the inventory held by the aircraft and parts industry is in the form of "goods in process." Accordingly, we may expect that changes in employment would precede changes in inventory and this relationship is shown on chart 16, which shows employment and inventories in the industry in relation to each other. The diverse trends in 1953 reflect the results of the Korean war buildup in the aircraft industry when the accumulation of inventories lagged behind employment. While employment was falling with the cutback of defense procurement at the end of the Korean war, inventories were only leveling.

The rise from 1955 to 1957 and the decline through 1958 were led by employment. Thereafter, the changes in inventory lagged considerably behind changes in employment. Based on the sustained rise in employment from the middle of 1960 to the first quarter of 1962, we would expect inventories in the aircraft and parts industry to begin to rise, as indeed they have in the first quarter of 1962. The widened gap between inventories and employment in the 1960–61 period was probably due to the lengthening production time on new weapons, particularly missiles and space work. But this is an area which deserves much closer study than we have been able to devote to it up to this time.

The sharp drop in aircraft and parts inventories from the third quarter of 1957 to the third quarter of 1958 was, in part, the result of a deliberate Defense Department policy. I think this is a particularly interesting example to this committee. Defense contractor inventories held under cost-reimbursement contracts are wholly owned by the Government and are therefore sensitive to changes in Defense Department policy. But even in the case of the larger fixed-price contracts, the Government finances a substantial part of defense contractors' inventories through progress payments.

As I mentioned earlier, in the summer and fall of 1957 the Defense Department undertook a series of measures to reduce expenditures. Two of these measures had a direct bearing on inventories held by defense contractors. The first had to do with cost-reimbursement contracts. Up to the fall of 1957, the Defense Department had followed the policy of reimbursing defense contractors for 100 percent of the allowable costs incurred. In order to effect a one-time reduction in expenditures and encourage a reduction in defense contractor inventories, a new cost-reimbursement policy was adopted on November 1, 1957. Under this policy, contractors were reimbursed for only 80 percent of the costs incurred; the remaining 20 percent was released as deliveries were made or specified increments of work were completed. Since the defense contractors were thus forced to share the cost of carrying inventories, they were given a very strong incentive to reduce them.

At the same time, the Defense Department reduced the amount of progress payments made against work put in place under fixed-price contracts—from 75 to 70 percent on all costs and from 90 to 85 percent on the cost of direct labor and materials alone. This action also increased the incentive for defense contractors to hold inventories to the lowest possible level.

Chart 17 shows the total Department of Defense progress payments outstanding, the greatest share of which is to firms in the aircraft and parts industry. Progress payments outstanding were sharply reduced from over $4 billion in the third quarter of 1957 to less than $2¾ billion by the end of 1958, while inventories in the aircraft industry declined from about $4¼ to $3½ billion. Progress payments outstanding continued to decline through 1959, to about $2¼ billion, while aircraft inventories rose again to about $3¾ billion. The rise in progress payments in the 1960–61 period is not necessarily related to the aircraft industry. Much of the increase is associated with the larger shipbuilding program of recent years. During the first quarter of 1962 both progress payments and inventories have risen. The 80–20 policy on cost reimbursements was abandoned last year and we are now again paying 100 percent of costs incurred. No change has been made in the progress payment formulas adopted in 1957.

Part of the sharp drop in progress payments outstanding is related to the declining proportion of fixed-price contracts during that period. As shown on chart 18, fixed-price contracts in 1955 constituted 76 percent of the total, but by 1960 they had declined to about 57 percent of the total.

While changes in inventory consistently lag changes in employment in the aircraft and parts industry, changes in employment generally lag changes in unfilled orders, as shown on chart 19. This relationship between employment and unfilled orders is very close for the whole period except 1960–61. The explanation for this divergence may lie in the shift to research and development work where "level of effort" type contracts are generally utilized.

Representative REUSS. What does that phrase mean?

Mr. HITCH. That means that you are paying in effect for employing a certain number of engineers and scientists to work on a research and development project funded at a predetermined level instead of specifying some specific product in advance which will be produced by them by a certain time.

Although the relationship between employment and unfilled orders is very close in the durable goods industries as a whole, as shown on chart 20, unfilled orders seem to lead on the downturns while employment seems to lead on the upturns. This phenomenon may be explained by the fact that sales in the durable goods industries lag well behind new orders. Thus, even when new orders turn up, with the resultant rise in employment, unfilled orders continue to decline for a period of time.

Shown on chart 21 are new orders and inventories in the durable goods industries. It is clear from this chart that changes in new orders precede changes in inventories. Here is the connecting link between inventories in the durable goods industries and defense procurement. This relationship between new orders received by the durable goods industries and military prime contracts awarded by the Defense Department is shown on the last chart, chart 22, where we have new orders in the durable goods industries at the top and military prime contract awards on the bottom.

And I again call your attention to the difference in scales, the new orders in the durable goods industries are the left-hand scale and defense prime contract awards, the right-hand scale, and the scale for the top series is about six times that for the bottom.

Because random and seasonal fluctuations in the quarterly data somewhat obscure the cyclical fluctuations, we have also plotted on this bottom line, as asterisks, the averages for the first and fourth quarters and the second and third quarters; that is, the last quarter in the calendar year and the first quarter in the new calendar year as an average and the second and third quarters as an average. As you can see, there is a rather close relationship between these two series in the years 1953 through 1958. The post-Korean war cutback in defense contract awards clearly had an important effect on orders received by the durable goods industries, and the subsequent increase in defense contract awards during the first half of 1954 helped the rise in new orders to the durable goods industries. Similarly, the buildup in defense ordering during the 1955–56 period stimulated the durable goods industries.

The Defense Department effort to reduce expenditures in 1957 is clearly depicted on this chart. This is the only year shown on the chart in which there is no seasonal peak of contract placements in the second quarter of the year. The increase in defense ordering during the second half of 1957 and the first half of 1958 precedes the upturn of new orders received by the durable goods industries. From the middle of 1958 to the middle of 1961 changes in the rate of contract awards did not seem to bear any relationship to changes in new orders received by the durable goods industries. But the increase in the defense program initiated by the new administration last spring is clearly evident in the rise of contract awards which has taken place since the middle of 1961.

The last asterisk, for the middle of 1962, I should caution, is an estimate, since only partial data are now available for the second quarter and none at all for the third. On the basis of our planned obligations for fiscal year 1963, I would anticipate a further rise in military prime contract awards over the next few quarters to an average level of perhaps $7½ to $8 billion per quarter. Thus, while new orders received by the durable goods industries appear to be leveling off, military prime contract awards continue to increase.

I believe it is clear from the data before us, to the extent defense activities have an influence on inventories in the durable goods industries, that influence is exerted originally through changes in the rate of contract placements. Changes in defense contractor inventories are in the main derivative of changes in the rate of contract placements. Thus, a defense policy designed to harmonize with the goal of economic stability would have to be aimed primarily at the rate of contract awards rather than directly at defense contractor inventories.

While it would certainly be possible to vary defense contractor inventories with different phases of the business cycle, the degree of flexibility available is quite limited. The bulk of the inventories held by defense contractors is in the form of work in process. And the level of work in process is directly related to the production flow and the production schedules. Variation in production schedules, of course, would simply mean variations in the rate of procurement. In defense industries, inventories of finished products are very small and any variation in such inventories would have little effect on the totals.

This leaves the third category, inventories of purchased materials, which, if the aircraft and parts industry is typical, accounts for less than a fifth of the total inventories held by defense contractors. In the case of the aircraft inventory, they would amount to about $600 million and even a rise of 50 percent would increase these inventories by only $300 million, a very small amount in relation to the gross national product or even total inventories in the durable goods industries.

But quite aside from the magnitudes involved, such a policy would raise very difficult administrative problems. The cost of carrying the excess inventories would have to be borne by the Government and contractual provisions would have to be made to allow the payment of such cost. Considering the great effort we are now making to increase efficiency in defense production, it is hard to see how both this objective and the stabilization objective can be achieved at the same time. A flexible policy on defense contractor inventories would be particularly difficult to incorporate into incentive contracts, which pay higher profits for good performance and penalize poor performance. Under such contracts it is entirely up to the contractor to determine the most efficient level of inventories. In fact, under any type of contract it is extremely difficult for anyone except the contractor to determine precisely the proper level of inventories required to perform a particular contract.

But this still leaves us with the broader question of whether a defense procurement policy could be devised which would be more in harmony with the goal of economic stability. Certainly, within very narrow limits, both in time and magnitude, the Defense Department has some degree of flexibility in the rate at which contracts are placed. As we have seen, the former administration on at least two occasions, 1954 and 1957–58, sought to accelerate contract placements with but a limited effect. Unless the overall level of procurement is raised, such a policy simply means ordering certain items earlier than we otherwise would. Its contribution to general economic stabilization, however, is limited by the fact that most defense contractors are highly specialized and cannot readily shift back and forth from military to civilian production, or in and out of civilian markets.

A similar effort was also made last spring by the present administration, but its effects were greatly overshadowed by the defense buildup which was undertaken in the spring and summer of 1961. Thus the current upward trend in defense contract placements reflects the increase in the overall defense program. And this increase is related not to economic objectives but to military objectives.

The defense program by its very nature must be highly responsible to changes in the international situation and in military technology. The possibilities of varying the pace of the defense program in a countercyclical manner are, therefore, quite limited. As I pointed out to the Joint Economic Committee last year—

> Most of our programs are closely interrelated and are geared to specific military requirements and time-phased schedules. It is not easy, nor would it be desirable, to accelerate such programs on any basis other than military needs.

(The charts referred to and supplemental tables later submitted for the record follow:)

CHART 1

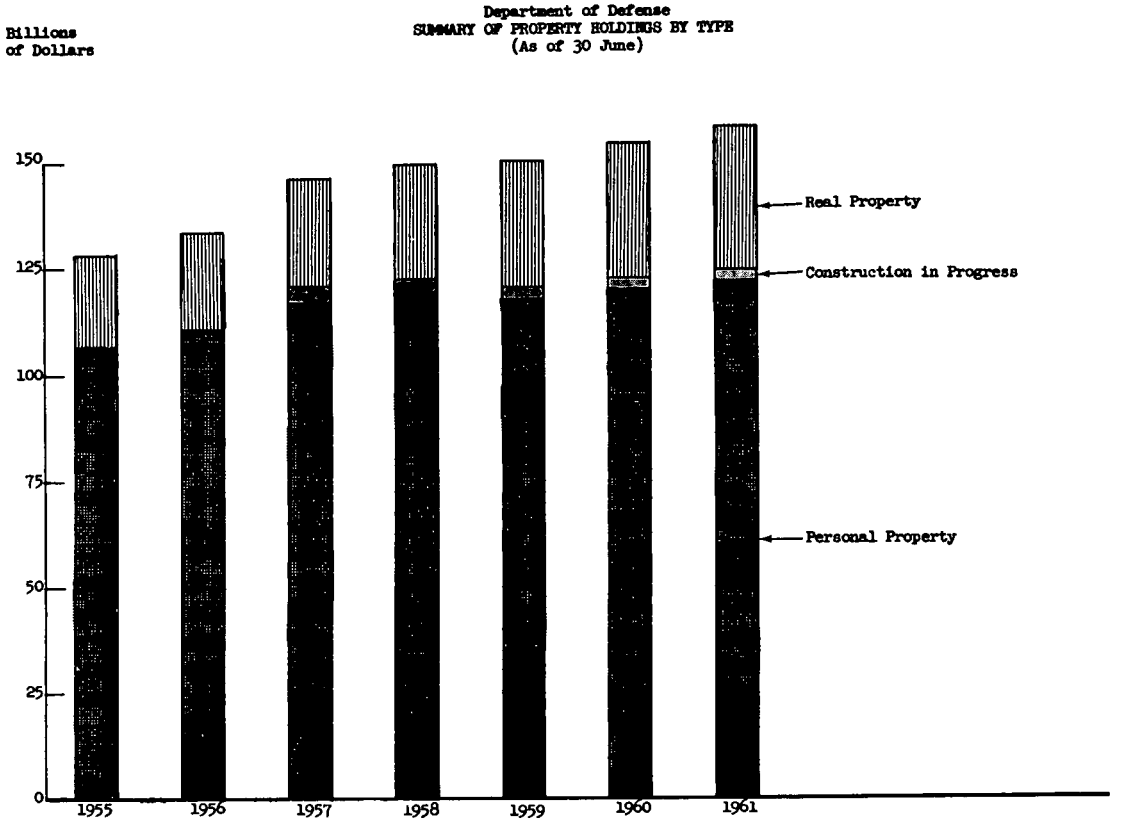

Department of Defense
SUMMARY OF PROPERTY HOLDINGS BY TYPE
(As of 30 June)
Billions of Dollars
150
125
100
75
50
25
0
1955
1956
1957
1958
1959
1960
1961
Real Property
Construction in Progress
Personal Property

CHART 2

Department of Defense
PERSONAL PROPERTY INVENTORY BY CLASS
(As of 30 June)

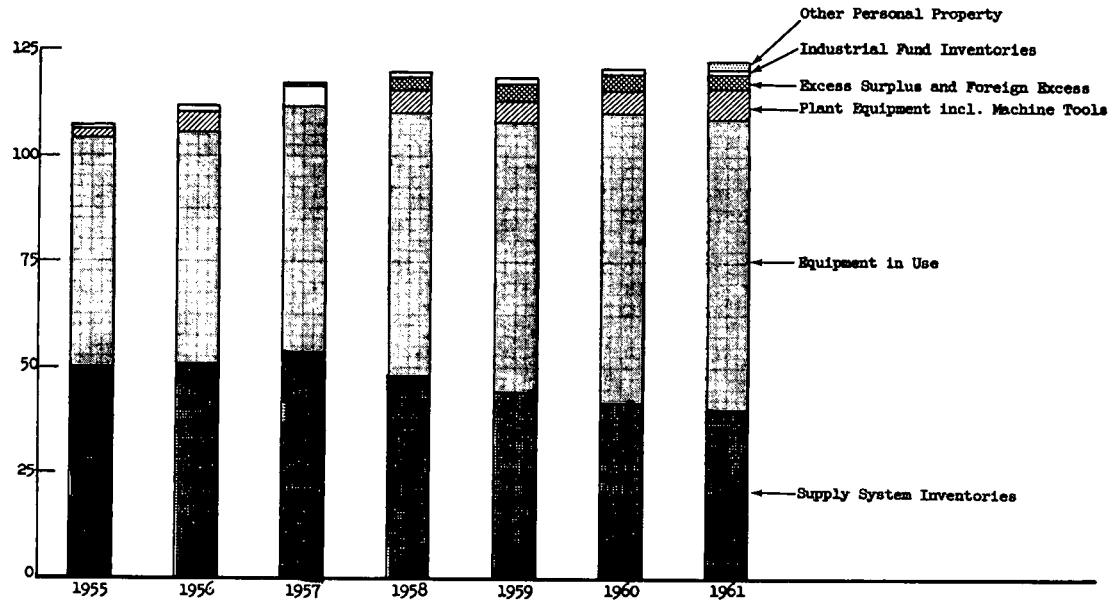


CHART 3

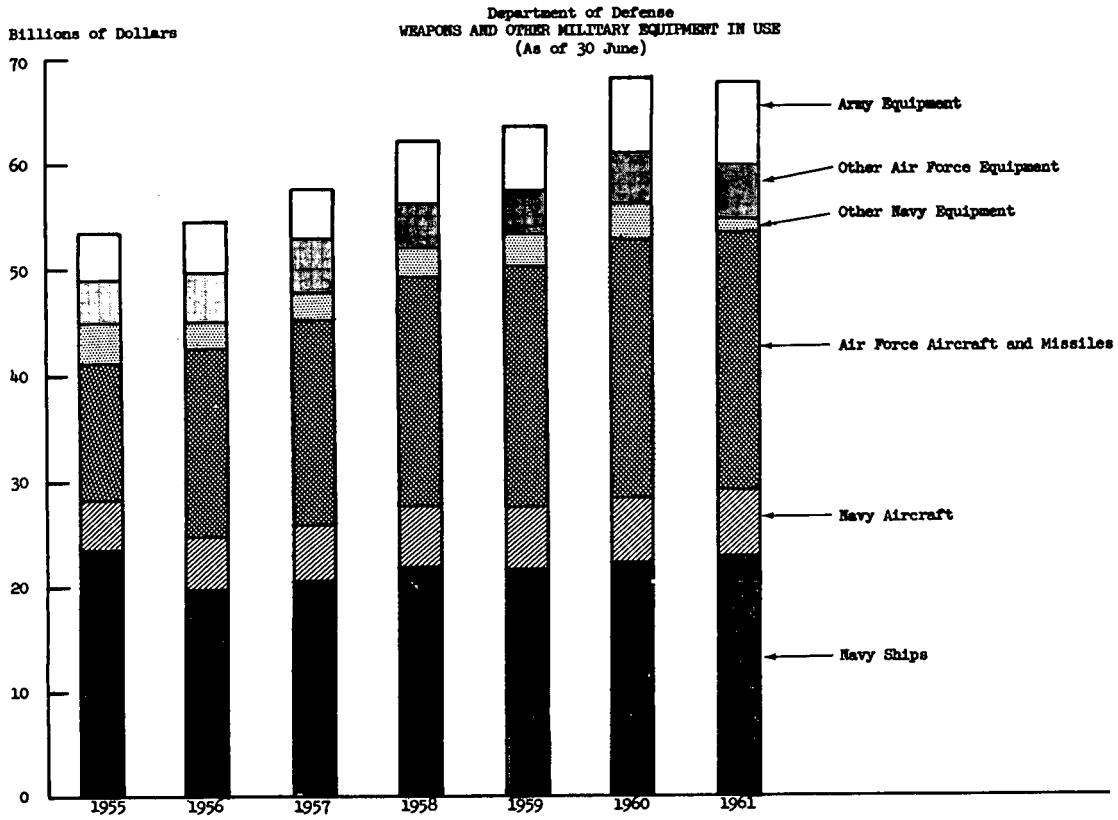

Department of Defense
WEAPONS AND OTHER MILITARY EQUIPMENT IN USE
(As of 30 June)
Billions of Dollars
70
60
50
40
30
20
10
0
1955
1956
1957
1958
1959
1960
1961
Army Equipment
Other Air Force Equipment
Other Navy Equipment
Air Force Aircraft and Missiles
Navy Aircraft
Navy Ships

CHART 4

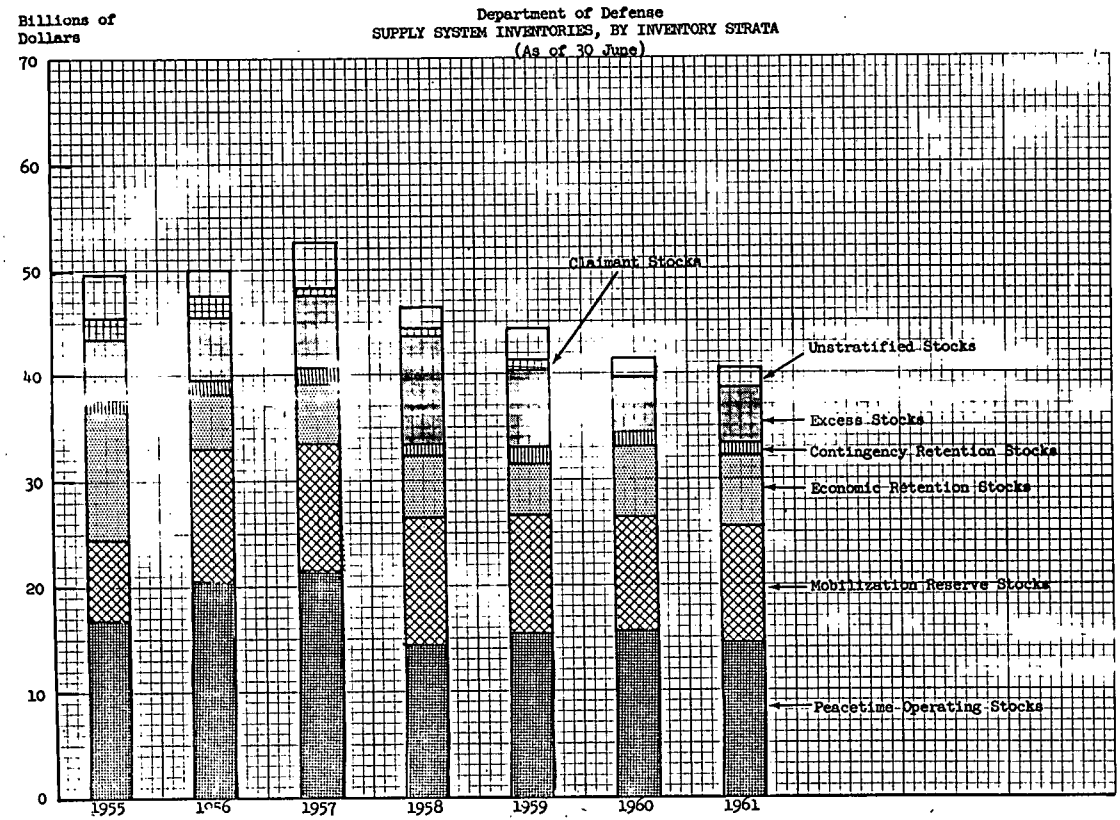

Billions of Dollars
Department of Defense
SUPPLY SYSTEM INVENTORIES, BY INVENTORY STRATA
(As of 30 June)
70
60
50
40
30
20
10
0
Claimant Stocks
Unstratified Stocks
Excess Stocks
Contingency Retention Stocks
Economic Retention Stocks
Mobilization Reserve Stocks
Peacetime Operating Stocks
1955
1956
1957
1958
1959
1960
1961

CHART 5

Department of Defense
EXCESS, SURPLUS AND FOREIGN EXCESS PERSONAL PROPERTY
GROSS DISPOSITIONS, BY TYPE OF DISPOSITIONS

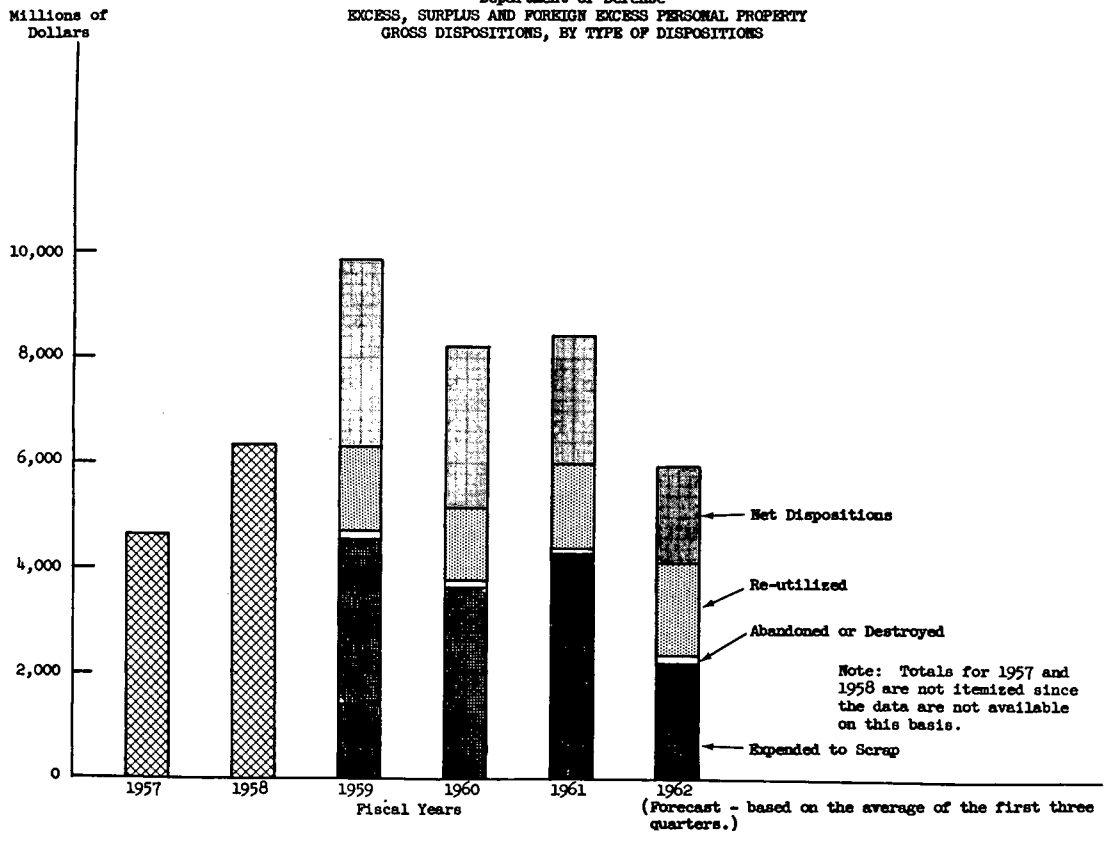


CHART 5A

Department of Defense

WORLD-WIDE DISPOSAL PROGRAM, FISCAL YEARS 1957-1962

(Millions of Dollars)

1.	Excess and Surplus Inventory, Begin FY 1957	1,564.9
2.	Plus: Gross Generations during FY 1957 a/	5,445.1
3.	Less: Gross Dispositions during FY 1957	-4,626.5
4.	Excess and Surplus Inventory, End FY 1957	2,383.5
5.	Plus: Gross Generations during FY 1958 a/	8,106.8
6.	Less: Gross Dispositions during FY 1958	-6,314.9
7.	Excess and Surplus Inventory, End FY 1958	4,175.4
8.	Plus: Gross Generations during FY 1959 a/	9,721.3
9.	Less: Gross Dispositions during FY 1959	-9,869.6
10.	Excess and Surplus Inventory, End FY 1959	4,027.1
11.	Plus: Gross Generations during FY 1960 a/	8,707.9
12.	Less: Gross Dispositions during FY 1960	-8,208.3
13.	Excess and Surplus Inventory, End FY 1960	4,526.7
14.	Plus: Gross Generations during FY 1961 a/	7,430.7
15.	Less: Gross Dispositions during FY 1961	-8,443.2
16.	Excess and Surplus Inventory, End FY 1961	3,514.2
17.	Plus: Gross Generations during first 9 months FY 1962 a/	3,835.2
18.	Less: Gross Dispositions during first 9 months FY 1962	-4,443.7
19.	Excess and Surplus Inventory, March 31, 1962	2,905.7

a/ Gross Generations reflect an inventory valuation adjustment made to the preceding inventory.

Source: Directorate for Statistical Services
Office of the Secretary of Defense

CHART 6

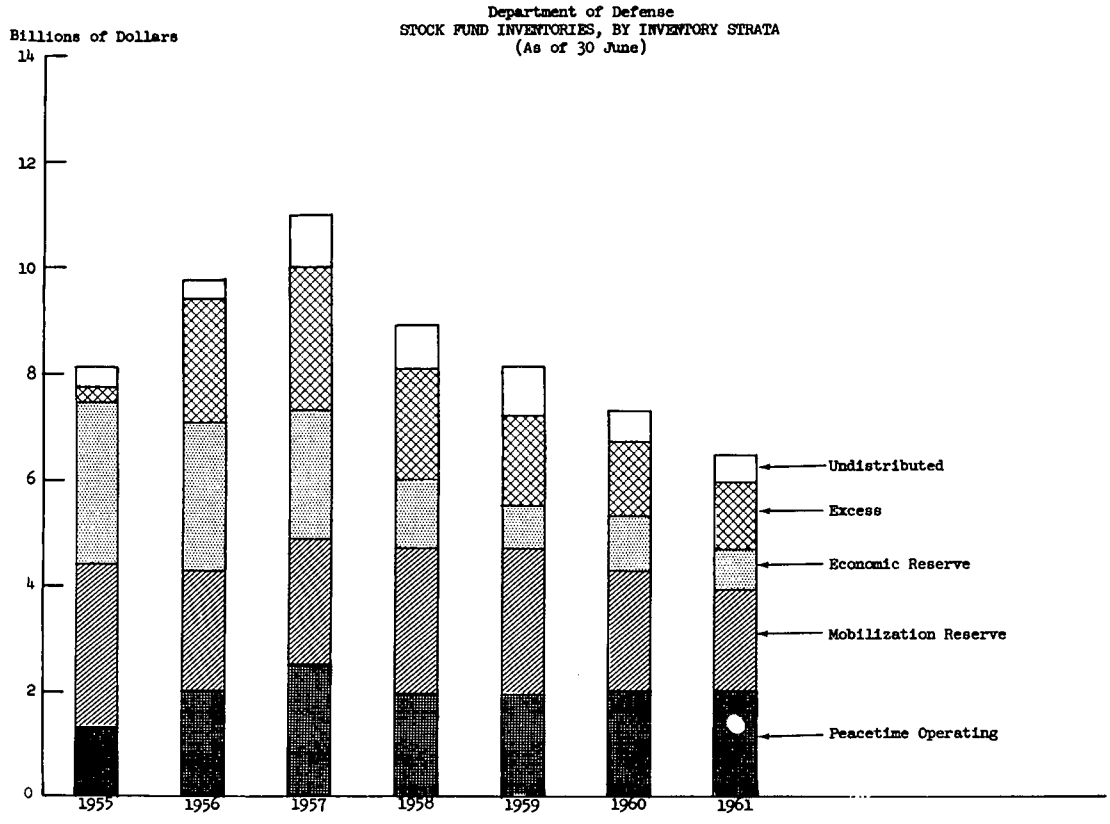

Department of Defense
STOCK FUND INVENTORIES, BY INVENTORY STRATA
(As of 30 June)
Billions of Dollars
14
12
10
8
6
4
2
0
1955
1956
1957
1958
1959
1960
1961
Undistributed
Excess
Economic Reserve
Mobilization Reserve
Peacetime Operating

CHART 7

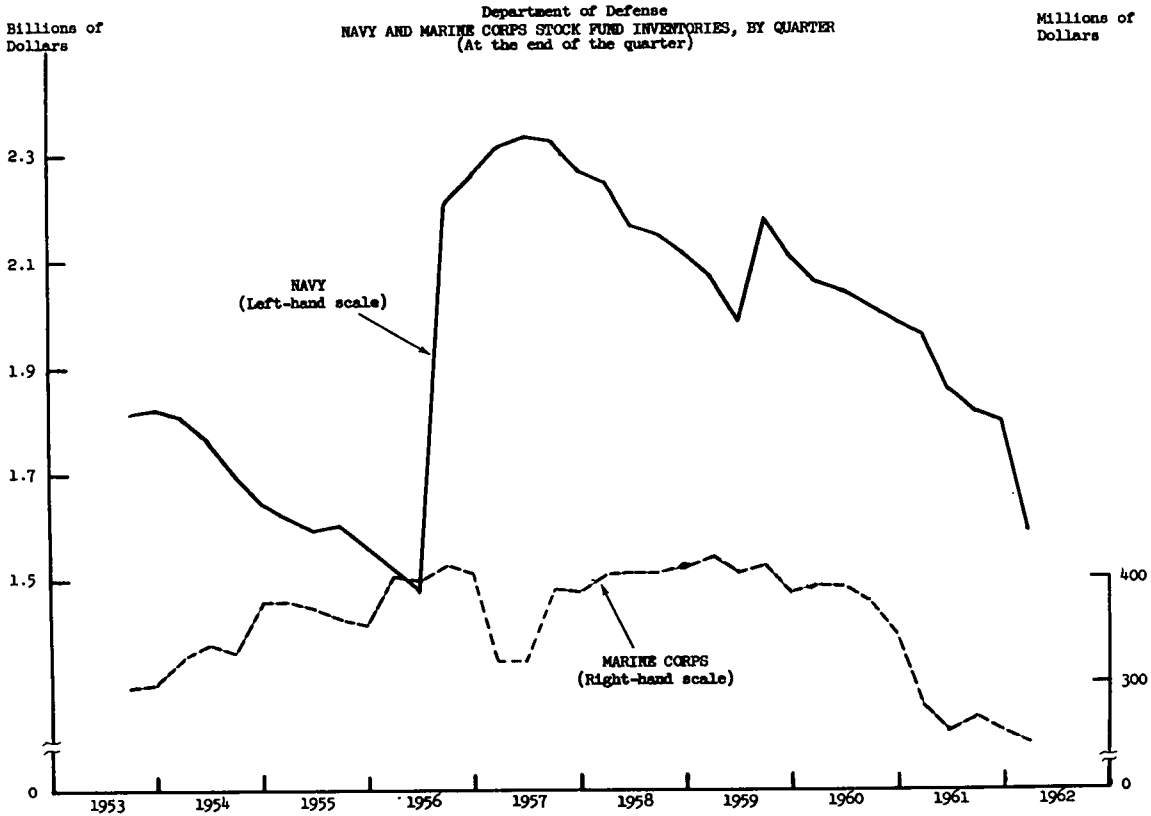


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CHART 8

Department of Defense
COMMODITY SINGLE MANAGER PROGRAM, NET INVESTMENT IN INVENTORIES
(As of 30 June)

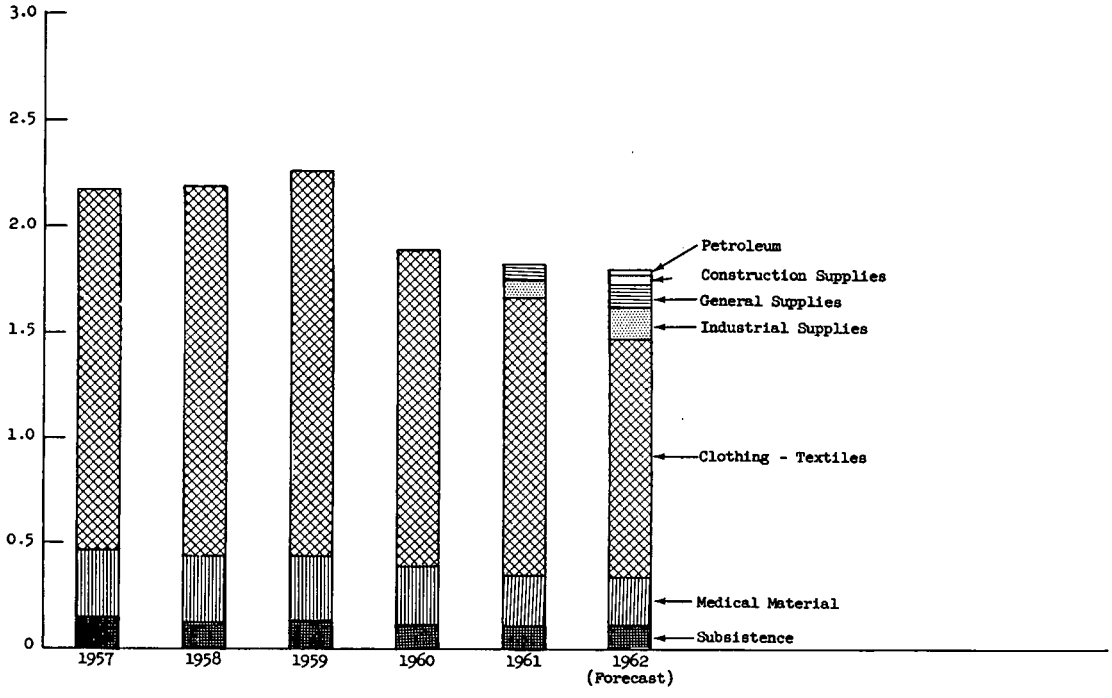


CHART 9

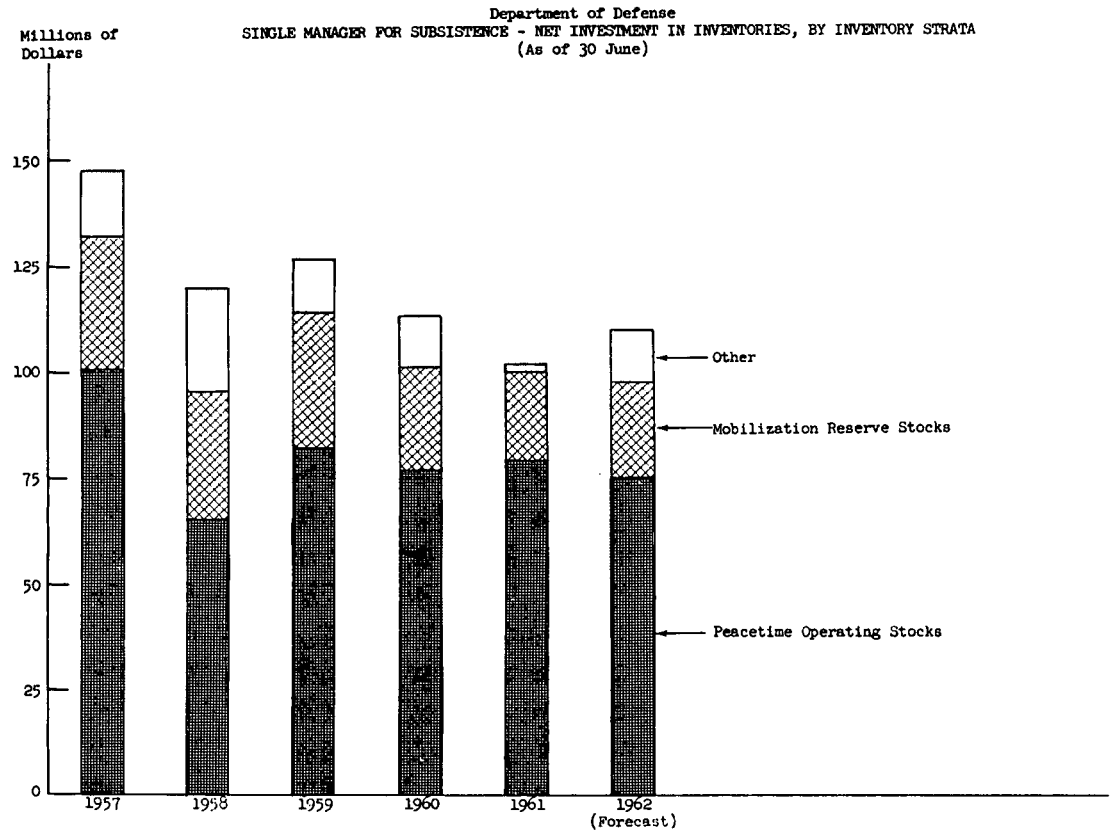

Department of Defense
SINGLE MANAGER FOR SUBSISTENCE - NET INVESTMENT IN INVENTORIES, BY INVENTORY STRATA
(As of 30 June)
Millions of Dollars
150
125
100
75
50
25
0
1957
1958
1959
1960
1961
1962
(Forecast)
Other
Mobilization Reserve Stocks
Peacetime Operating Stocks

CHART 10

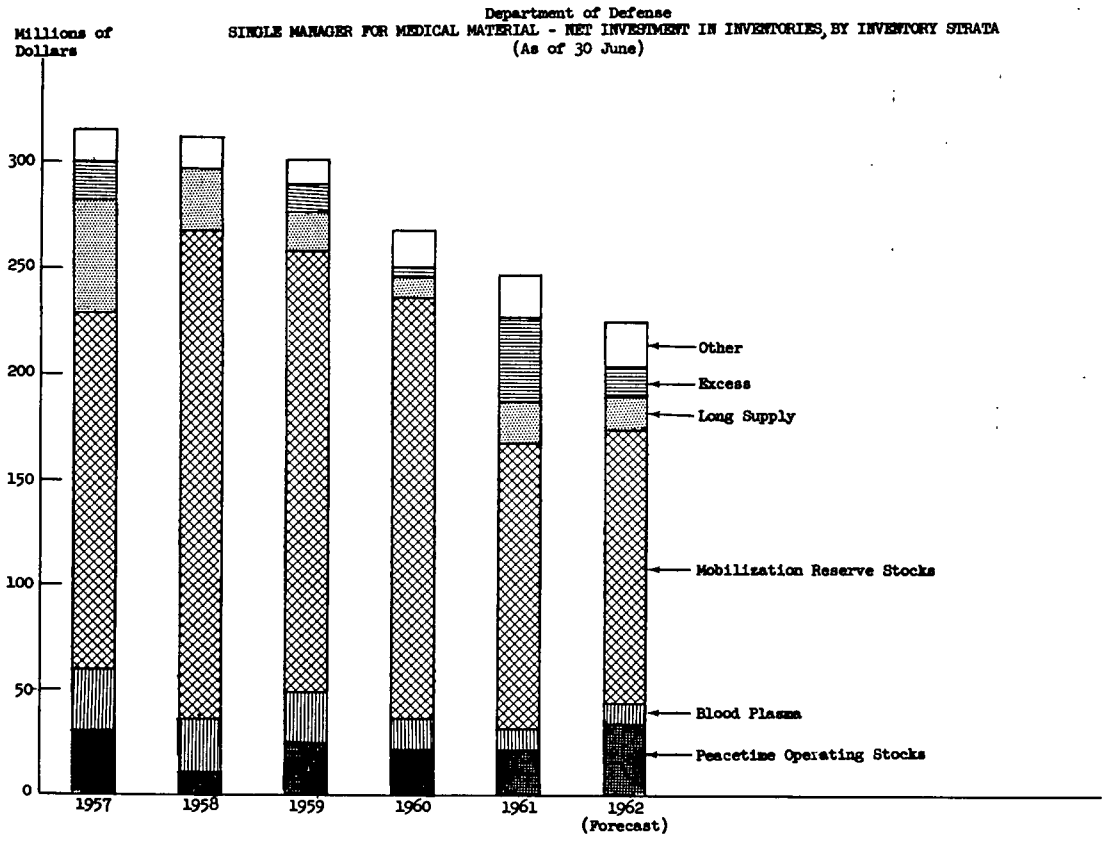

Department of Defense
SINGLE MANAGER FOR MEDICAL MATERIAL - NET INVESTMENT IN INVENTORIES, BY INVENTORY STRATA
(As of 30 June)
Millions of Dollars
300
250
200
150
100
50
0
1957
1958
1959
1960
1961
1962
(Forecast)
Other
Excess
Long Supply
Mobilization Reserve Stocks
Blood Plasma
Peacetime Operating Stocks

CHART 11

Department of Defense
SINGLE MANAGER FOR CLOTHING AND TEXTILES - NET INVESTMENT IN INVENTORIES, BY INVENTORY STRATA
(As of 30 June)

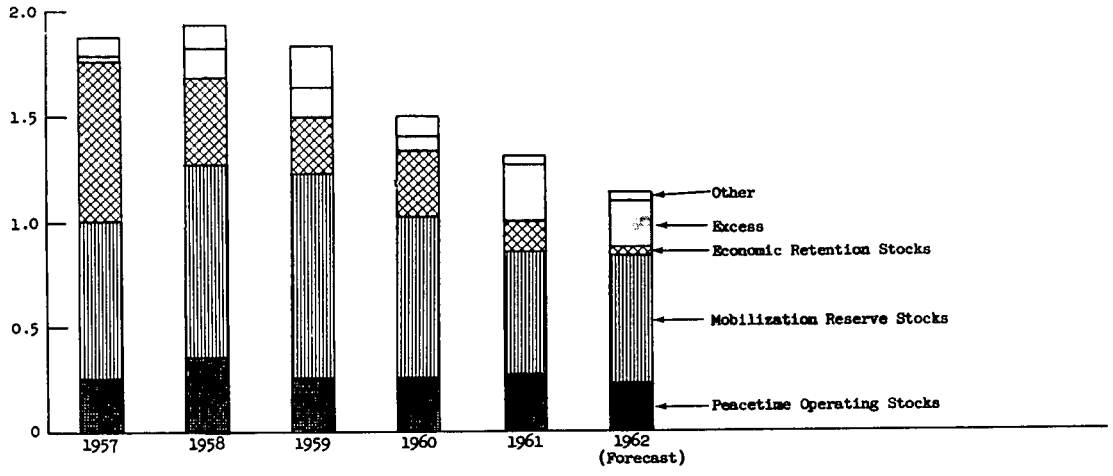


CHART 12

Department of Defense
SINGLE MANAGER FOR SUBSISTENCE - NET INVESTMENT IN INVENTORIES, BY QUARTER
(As of the end of the period)

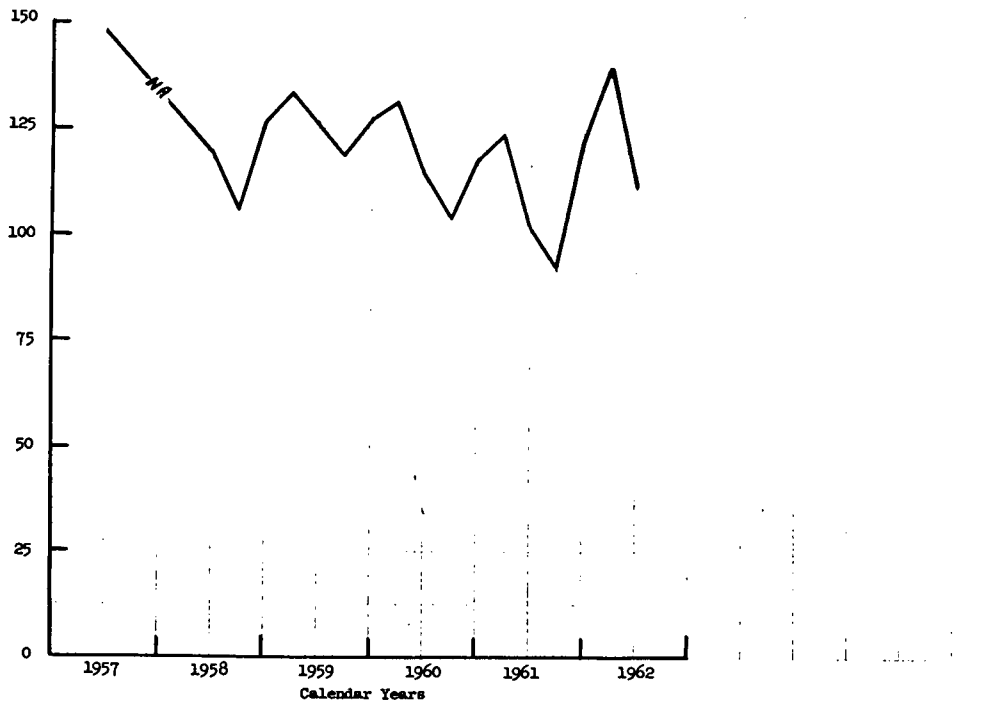


CHART 13

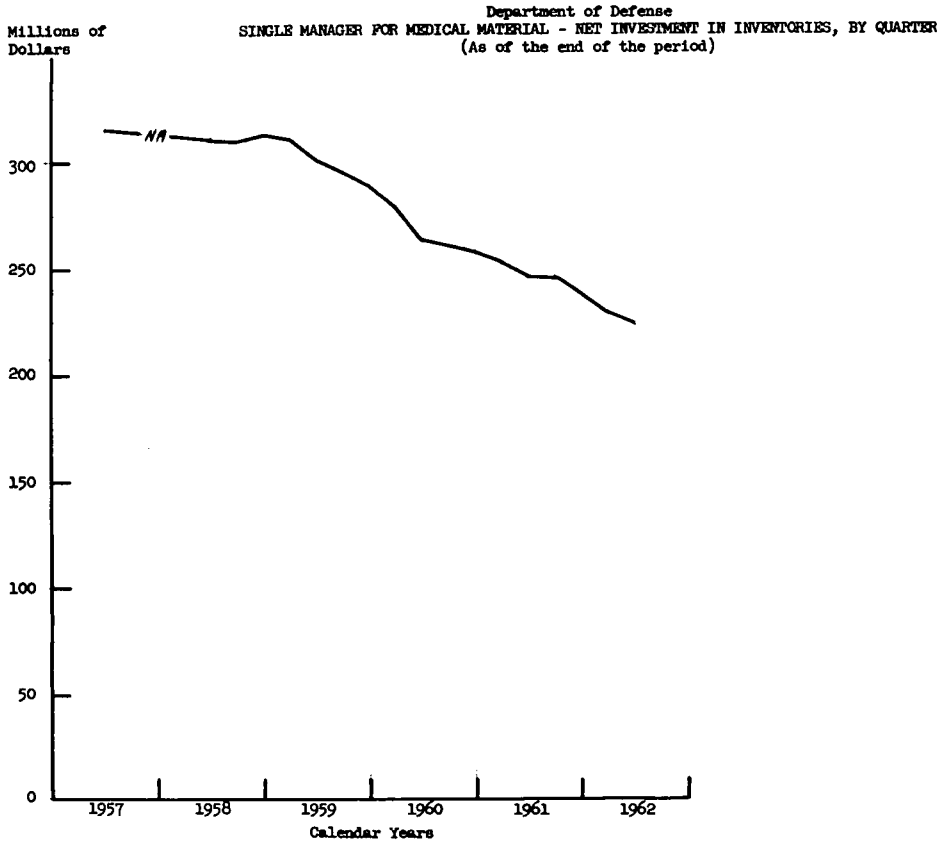

Department of Defense
SINGLE MANAGER FOR MEDICAL MATERIAL - NET INVESTMENT IN INVENTORIES, BY QUARTER
(As of the end of the period)
Millions of Dollars
NA
300
250
200
150
100
50
0
1957
1958
1959
1960
1961
1962
Calendar Years

CHART 14

Department of Defense
SINGLE MANAGER FOR CLOTHING AND TEXTILES - NET INVESTMENT IN INVENTORIES, BY QUARTER
(As of the end of the Period)

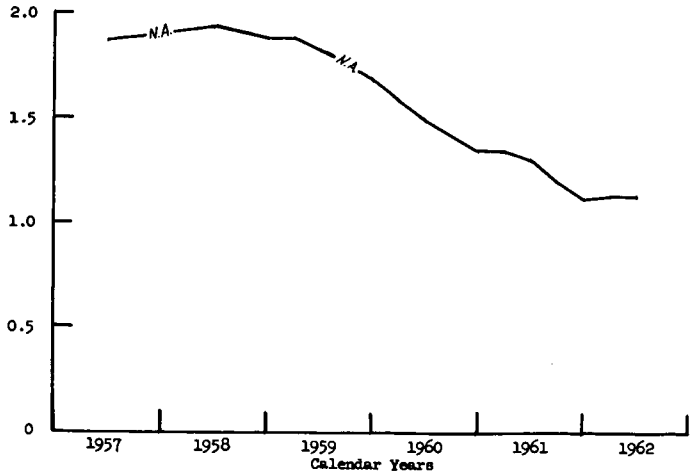


CHART 15

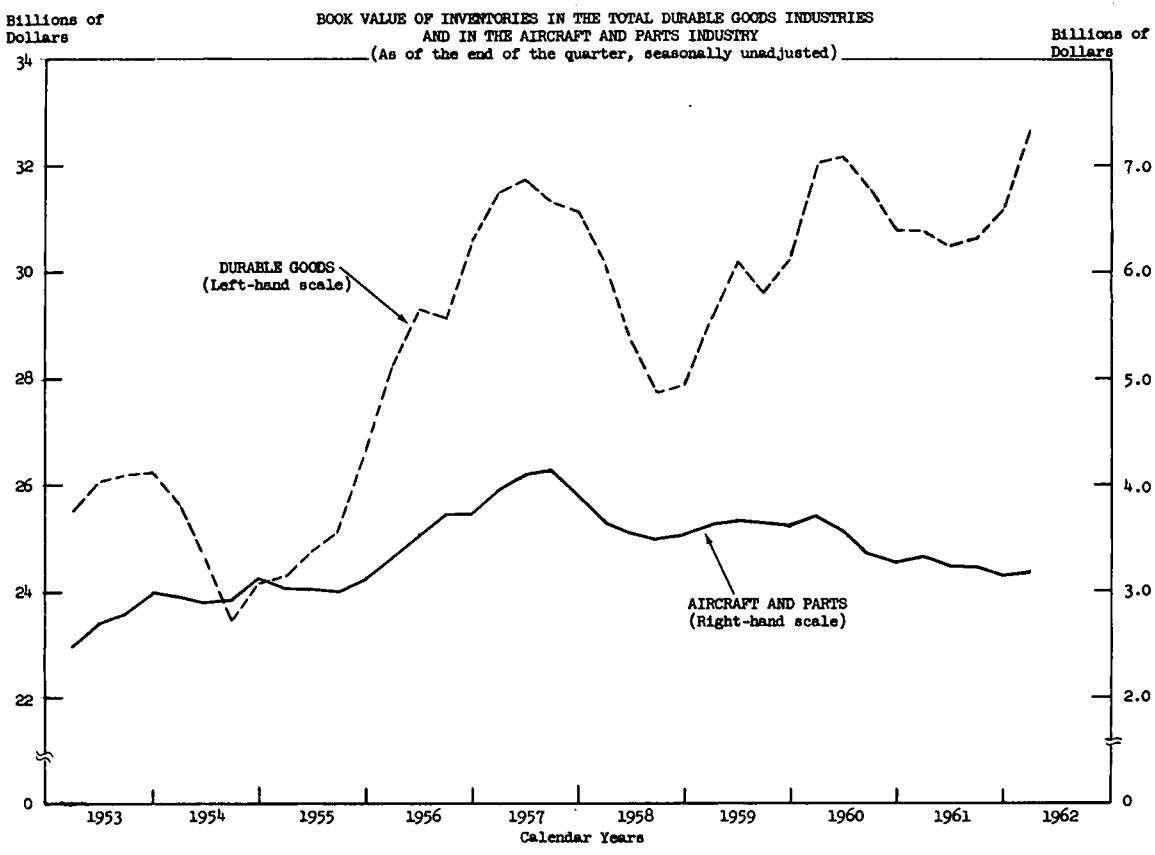

BOOK VALUE OF INVENTORIES IN THE TOTAL DURABLE GOODS INDUSTRIES
AND IN THE AIRCRAFT AND PARTS INDUSTRY
(As of the end of the quarter, seasonally unadjusted)
Billions of Dollars
Billions of Dollars
34
32
30
28
26
24
22
0
7.0
6.0
5.0
4.0
3.0
2.0
0
DURABLE GOODS
(Left-hand scale)
AIRCRAFT AND PARTS
(Right-hand scale)
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
Calendar Years

CHART 16

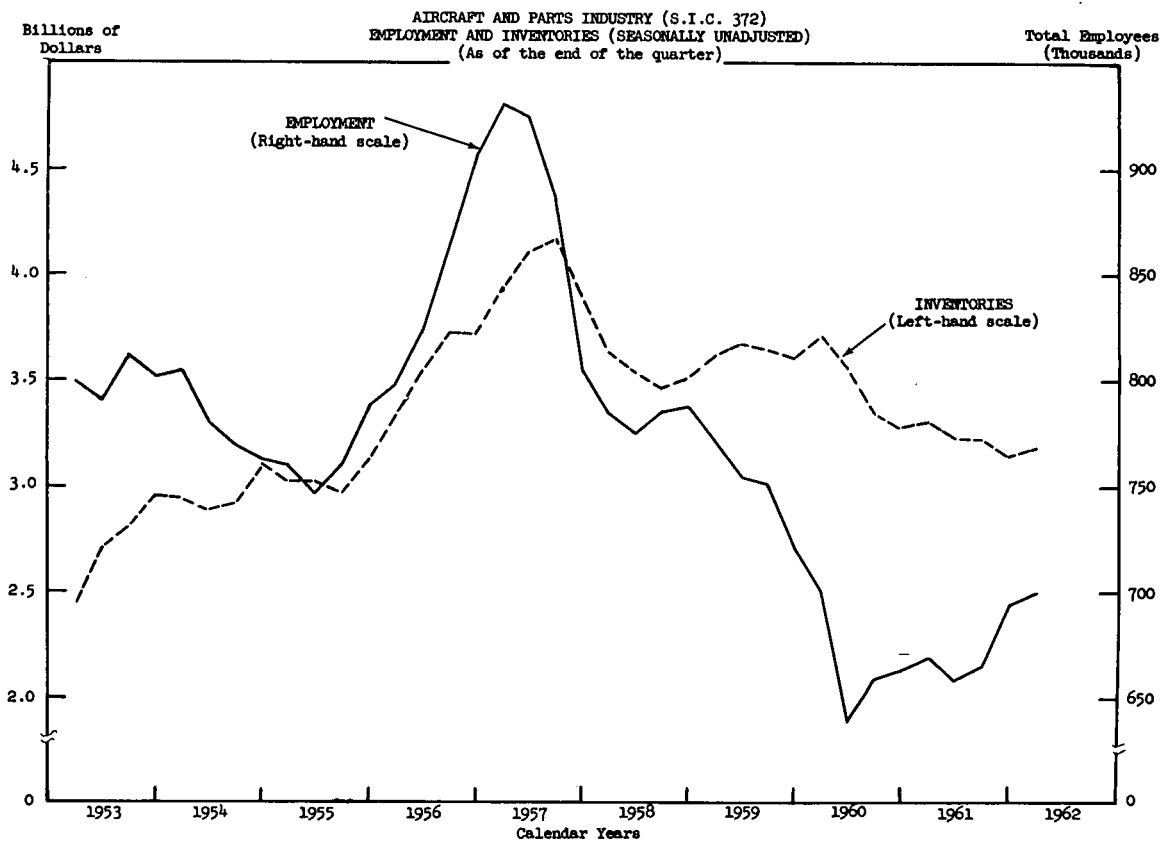

AIRCRAFT AND PARTS INDUSTRY (S.I.C. 372)
EMPLOYMENT AND INVENTORIES (SEASONALLY UNADJUSTED)
(As of the end of the quarter)
Billions of Dollars
Total Employees (Thousands)
EMPLOYMENT (Right-hand scale)
INVENTORIES (Left-hand scale)
4.5
4.0
3.5
3.0
2.5
2.0
0
900
850
800
750
700
650
0
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
Calendar Years

CHART 17

INVENTORIES IN THE AIRCRAFT AND PARTS INDUSTRY (SEASONALLY UNADJUSTED)
AND DEPARTMENT OF DEFENSE PROGRESS PAYMENTS OUTSTANDING
(As of the end of the quarter)

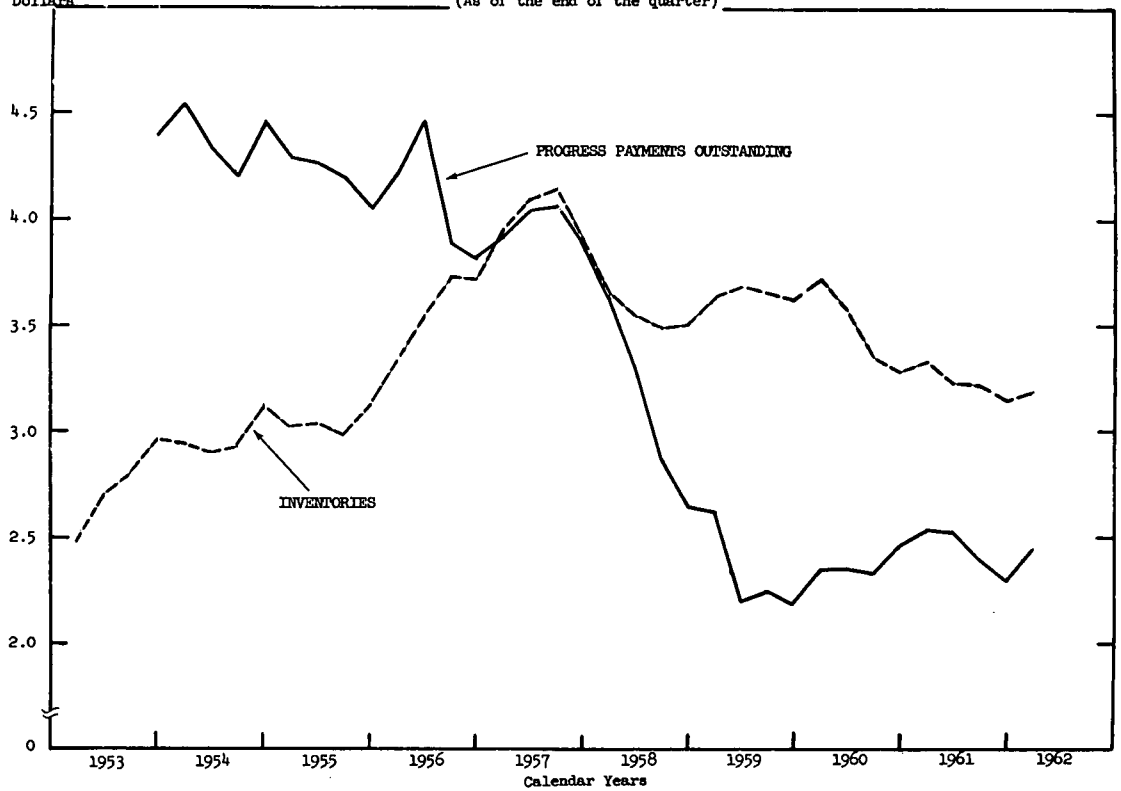


CHART 18

Department of Defense
FIXED PRICE TYPE CONTRACTS AND COST REIMBURSEMENT TYPE CONTRACTS
AS A PROPORTION OF TOTAL CONTRACT AWARDS

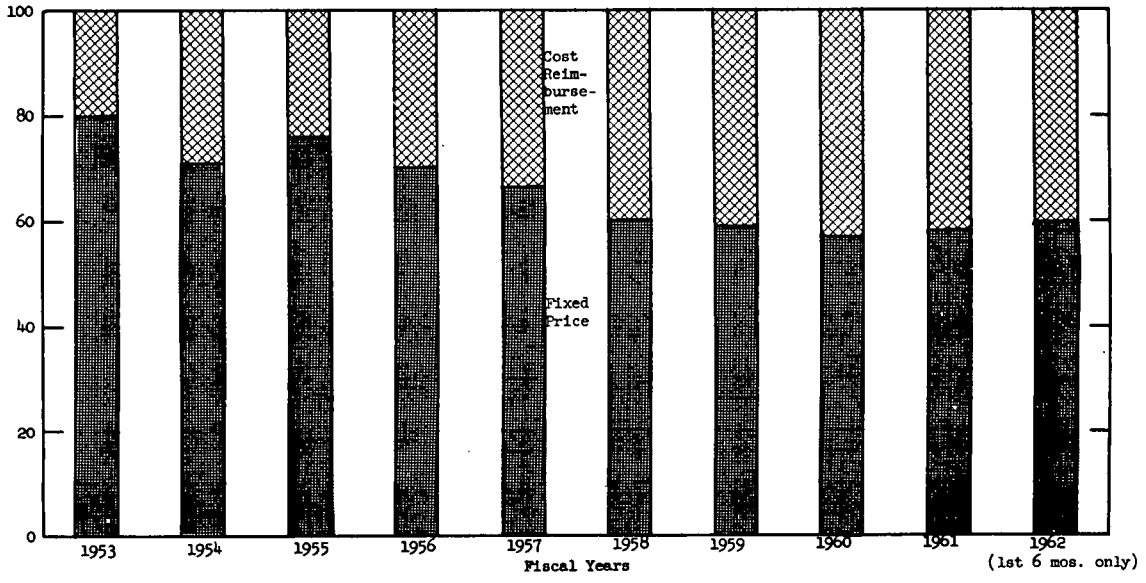


CHART 19

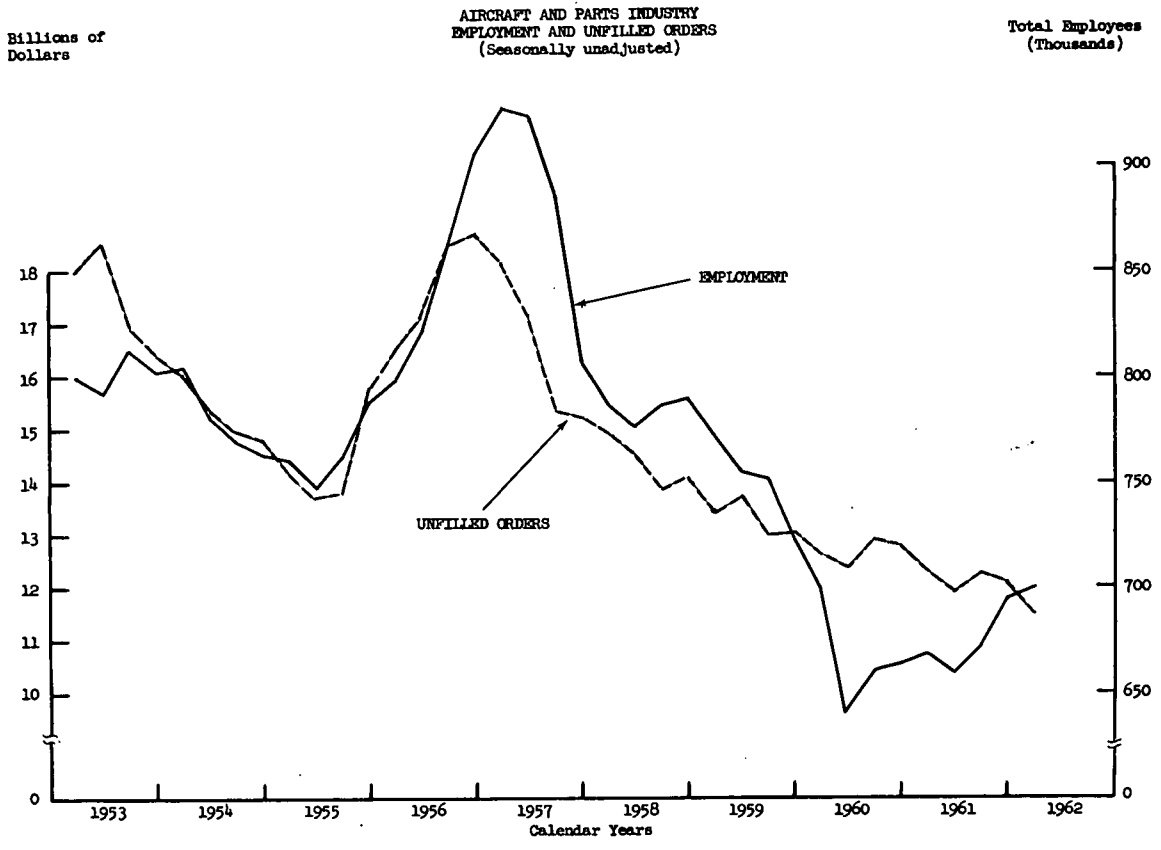

AIRCRAFT AND PARTS INDUSTRY
EMPLOYMENT AND UNFILLED ORDERS
(Seasonally unadjusted)
Billions of Dollars
Total Employees (Thousands)
EMPLOYMENT
UNFILLED ORDERS
18
17
16
15
14
13
12
11
10
0
900
850
800
750
700
650
0
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
Calendar Years

CHART 20

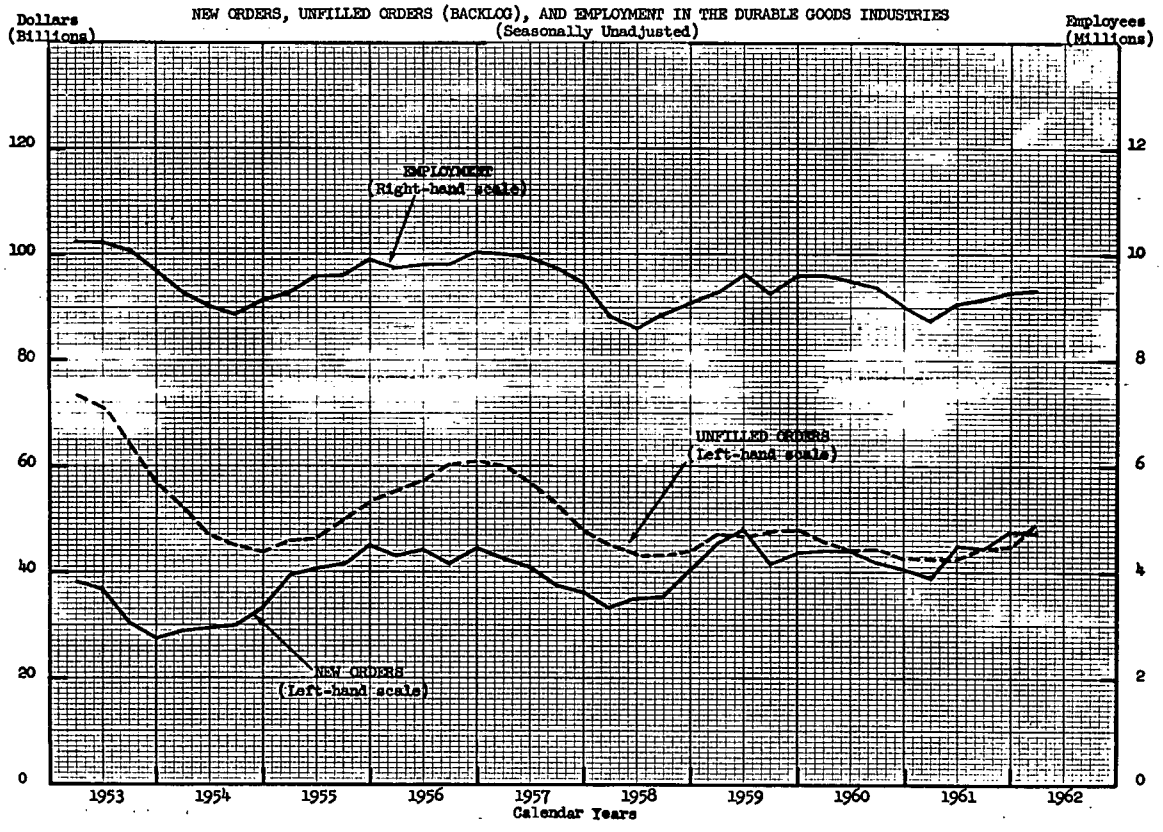

NEW ORDERS, UNFILLED ORDERS (BACKLOG), AND EMPLOYMENT IN THE DURABLE GOODS INDUSTRIES
(Seasonally Unadjusted)
Dollars (Billions)
Employees (Millions)
120
100
80
60
40
20
0
12
10
8
6
4
2
0
EMPLOYMENT (Right-hand scale)
UNFILLED ORDERS (Left-hand scale)
NEW ORDERS (Left-hand scale)
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
Calendar Years

CHART 21

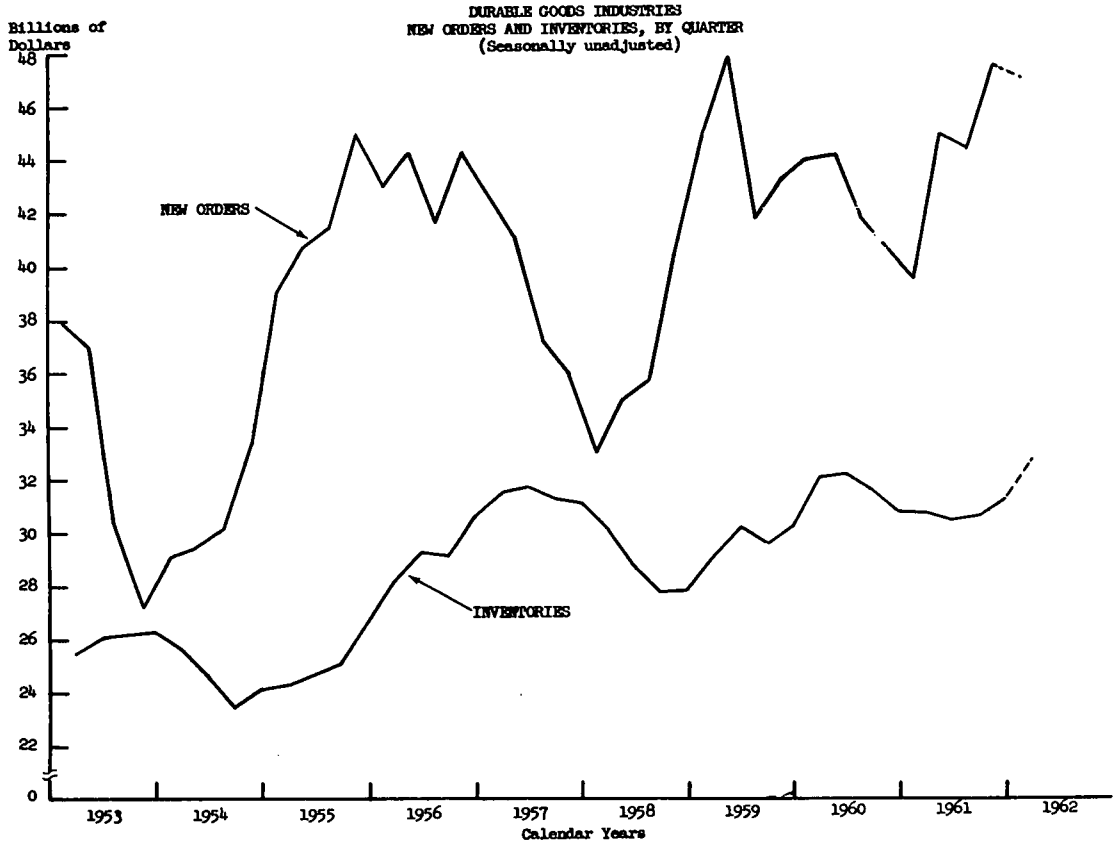

DURABLE GOODS INDUSTRIES
NEW ORDERS AND INVENTORIES, BY QUARTER
(Seasonally unadjusted)
Billions of Dollars
48
46
44
42
40
38
36
34
32
30
28
26
24
22
0
NEW ORDERS
INVENTORIES
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
Calendar Years

CHART 22

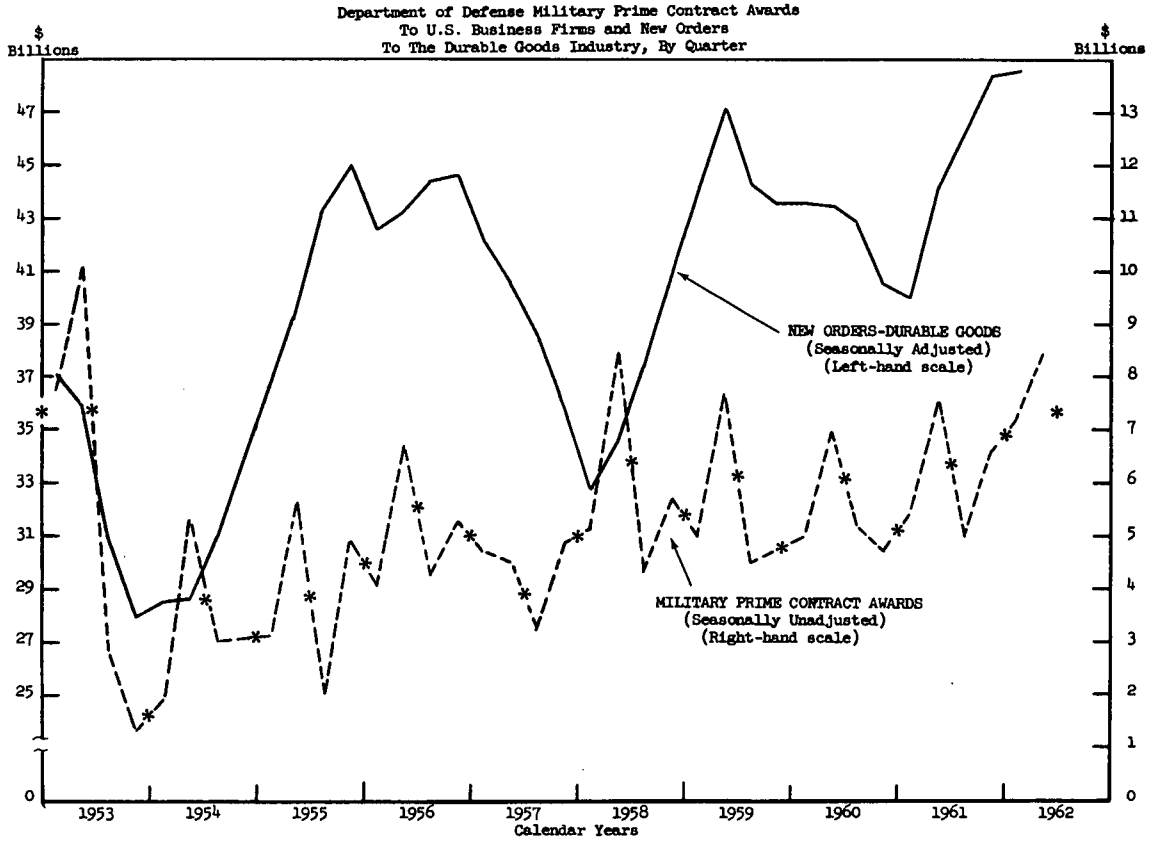

Department of Defense Military Prime Contract Awards
To U.S. Business Firms and New Orders
To The Durable Goods Industry, By Quarter
$ Billions
$ Billions
47
45
43
41
39
37
35
33
31
29
27
25
0
13
12
11
10
9
8
7
6
5
4
3
2
1
0
NEW ORDERS-DURABLE GOODS
(Seasonally Adjusted)
(Left-hand scale)
MILITARY PRIME CONTRACT AWARDS
(Seasonally Unadjusted)
(Right-hand scale)
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
Calendar Years

TABLE 1.—*Department of Defense—Summary of property holdings*

[Millions of dollars]

	June 30, 1955	June 30, 1956	June 30, 1957	June 30, 1958	June 30, 1959	June 30, 1960	June 30, 1961
Total	128,694	134,082	146,021	149,465	150,660	154,617	158,508
Real property	21,343	22,918	24,892	26,891	29,689	31,997	34,038
Construction in progress			3,790	2,822	3,255	2,417	2,434
Personal property [1]	107,351	111,164	117,339	119,752	117,716	120,203	122,036
Supply system inventories	50,780	50,974	[2] 54,127	47,652	44,467	42,002	40,838
Other personal property	56,571	60,190	63,212	72,100	73,249	78,201	[3] 81,194
Equipment in use	53,363		[3] 57,607	62,064	63,573	[4] 68,111	
Weapons and other military equipment in use		54,570					[4] 67,564
Plant equipment							[5] 7,607
Production equipment		5,308	5,300	5,509	5,278	5,233	
Machine tools [5]	2,928						
Industrial fund inventories	280	312	305	352	371	330	1,040
Excess, surplus, and foreign excess				4,175	4,027	4,527	3,514

[1] Includes personal property of the Office of the Secretary of Defense.
[2] Includes Air Force personal property in hands of property disposal officers.
[3] Includes $1,470,000,000 Air Force property provided contractors.
[4] Includes Fleet Marine Force organic property, $500,000,000.
[5] Inventory dates differ slightly.
[6] Reflects reclassification of $1,900,000,000 of plant equipment in Navy shore installations from "Weapons and Other Equipment in Use" to "Plant Equipment."

Source and coverage: These data represent a consolidation of supply system (including stock fund) inventories as reported by the Army, Navy, Air Force, and Marine Corps, and published in "Real and Personal Property of the Department of Defense." Stratification by each service in each year is responsive to the differing requirements of each service at that time. In addition, inventory reporting has improved as supply management techniques improve, and therefore year-to-year comparisons may not be completely valid.

TABLE 2.—*Department of Defense—Weapons and other military equipment in use (as of June 30)*

[Billions of dollars]

	1955	1956	1957	1958	1959	1960	1961
Total	53.3	54.5	57.6	62.1	63.6	68.1	[1] 67.5
Navy ships [2]	23.6	[3] 19.8	20.5	21.8	21.5	22.1	22.6
Navy aircraft [4]	4.6	5.0	5.3	5.9	6.1	6.1	6.4
Air Force aircraft and missiles [5]	13.1	17.8	19.3	21.5	22.7	24.6	24.3
Other Navy equipment [6]	3.7	2.5	2.8	2.8	2.8	3.4	1.3
Other Air Force equipment	4.0	4.6	5.1	4.1	4.3	4.7	5.0
Army equipment [7]	4.3	4.8	4.6	6.0	6.2	7.2	7.9

[1] Reflects reclassification of $1,900,000,000 of plant equipment in Navy shore installations from "Weapons and Other Equipment in Use" to "Plant Equipment."
[2] Navy ships does not include a roughly constant $1,000,000,000 in harbor tugs, minesweeping boats, etc.
[3] This $3,800,000,000 drop is due primarily to the exclusion from accumulated financial accounts of ships lost in World War II.
[4] Navy aircraft does not include missiles.
[5] Air Force aircraft includes guided missiles, but not guided rockets.
[6] Other Navy does not include Marine forces until fiscal year 1960. The Marine component in fiscal year 1960 is $500,000,000, in fiscal year 1961, $457,000,000.
[7] Army equipment includes all combat and support material in the possession of Army and National Guard units, such as artillery, small arms, tanks, aircraft, and missiles.

Source: Department of Defense, Office of the Comptroller, "Real and Personal Property of the Department of Defense."

TABLE 3.—*Department of Defense—Supply system inventories (including stock funds), by inventory strata, as of dates shown*

[Millions of dollars]

	June 30, 1955	June 30, 1956	June 30, 1957	June 30, 1958	June 30, 1959	June 30, 1960	June 30, 1961
Total stocks [1]	[2] 49,886	50,026	52,746	46,585	44,203	41,727	40,537
Unstratified stocks	2,318	2,608	[3] 4,738	2,440	3,056	2,083	1,819
Stratified stocks, total	45,770	47,418	48,008	44,145	41,147	39,644	38,718
Peacetime operating	[4] 16,921	[4] 20,759	[4] 21,410	14,538	15,306	15,657	14,722
Mobilization reserve	7,805	12,338	12,236	12,134	11,531	10,893	11,030
Economic retention	11,611	5,052	5,394	5,593	4,703	6,618	6,343
Contingency retention	1,447	1,323	1,742	1,050	1,611	1,361	1,246
Excess stocks	[5] 5,661	[6] 6,202	6,691	10,419	7,146	5,115	5,377
Claimant	2,325	1,744	535	411	850	----------	----------

[1] Excludes Navy shipboard supplies and spare aircraft engines, as follows:

	Shipboard supplies	Spare aircraft engines
	Million	*Million*
June 1955	$190	$704
June 1956	174	774
June 1957	205	848
June 1958	226	841
June 1959	264	----------
June 1960	276	----------
June 1961	301	----------

[2] Includes $1,799,000,000 Marine Corps stocks not stratified.
[3] Includes $1,294,000,000 Marine Corps appropriations stores account stocks not stratified.
[4] Includes Air Force and Marine Corps retention stocks.
[5] Includes Navy and Air Force stocks earmarked for mutual defense assistance program.
[6] Includes Army "unserviceable" stocks later stratified as peacetime operating stocks, and economic retention stocks.

Source and coverage: These data represent a consolidation of supply system (including stock fund) inventories as reported by the Army, Navy, Air Force, and Marine Corps, and published in "Real and Personal Property of the Department of Defense." Stratification by each service in each year is responsive to the differing requirements of each service at that time. In addition, inventory reporting has improved as supply management techniques improve, and therefore year-to-year comparisons may not be completely valid.

TABLE 4.—*Department of Defense—Excess, surplus and foreign excess personal property, gross dispositions, by type of dispositions*

[Millions of dollars]

	Fiscal years—					
	1957 [1]	1958 [1]	1959	1960	1961	1962 [2]
Total	4,626.5	6,314.9	9,869.6	8,208.3	8,443.2	5,924.9
Net dispositions	----------	----------	3,580.5	3,057.0	2,415.6	1,846.8
Reutilized	----------	----------	1,613.7	1,406.6	1,652.2	1,829.3
Abandoned or destroyed	----------	----------	98.6	117.8	43.6	46.5
Expended to scrap	----------	----------	4,576.8	3,626.9	4,331.8	2,202.3

[1] Totals for 1957 and 1958 are not itemized since the data are not available on this basis.
[2] Forecast based on the average of the 1st three-quarters.

TABLE 5.—*Department of Defense—Stock fund inventories, by inventory strata (as of 30 June)*

[Billions of dollars]

	Peacetime operating	Mobilization reserve	Economic reserve	Excess	Undistributed [1]	Total
1955	1.28	3.11	3.06	0.30	0.40	8.15
1956	2.03	2.22	2.83	2.31	.38	9.77
1957	2.50	2.38	2.49	2.65	.95	10.97
1958	1.95	2.76	1.25	2.16	.79	8.91
1959	1.93	2.75	.80	1.71	.97	8.16
1960	1.98	2.28	1.07	1.35	.63	7.31
1961	1.96	1.90	.81	1.28	.49	6.44

[1] Includes contingency reserve and claimant stocks when they exist.

Source: Department of Defense, Office of the Comptroller, "Working Capital Funds of the Department of Defense, 1961."

TABLE 6.—*Department of Defense—Navy and Marine Corps stock fund inventories by quarter (at the end of the quarter)*

Calendar year and quarter	Navy stock fund	Marine Corps stock fund	Calendar year and quarter	Navy stock fund	Marine Corps stock fund
1953:	(*Billions*)	(*Millions*)	1958:	(*Billions*)	(*Millions*)
3d quarter	$1.813	$297.2	1st quarter	$2.250	$403.9
4th quarter	1.821	301.2	2d quarter	2.166	405.2
1954:			3d quarter	2.149	405.5
1st quarter	1.809	325.4	4th quarter	2.115	410.4
2d quarter	1.767	338.8	1959:		
3d quarter	1.697	330.6	1st quarter	2.071	420.2
4th quarter	1.642	377.4	2d quarter	1.987	406.6
1955:			3d quarter	2.184	413.7
1st quarter	1.617	378.7	4th quarter	2.109	385.7
2d quarter	1.594	373.0	1960:		
3d quarter	1.601	362.1	1st quarter	2.059	393.6
4th quarter	1.560	356.5	2d quarter	2.043	393.2
1956:			3d quarter	2.015	379.3
1st quarter	1.520	403.0	4th quarter	1.988	346.6
2d quarter	1.478	399.1	1961:		
3d quarter	2.206	413.5	1st quarter	1.961	279.6
4th quarter	2.261	406.0	2d quarter	1.855	256.8
1957:			3d quarter	1.813	269.0
1st quarter	2.315	323.2	4th quarter	1.795	256.4
2d quarter	2.334	322.5	1962:		
3d quarter	2.325	390.4	1st quarter	1.592	246.8
4th quarter	2.270	388.2			

Source: Department of Defense OASD (Comptroller), "Working Capital Funds of the Department of Defense."

TABLE 7.—*Department of Defense—Commodity single manager program, net investment in inventories*

[Millions of dollars]

As of 30 June—	1957	1958	1959	1960	1961	1962 (forecast)
Total	2,323.9	2,360.8	2,253.9	1,874.0	1,819.1	1,787.8
Subsistence	147.5	119.5	126.4	114.2	102.0	110.9
Medical	315.8	311.4	301.1	267.7	246.1	224.6
Clothing-textiles	1,860.6	1,929.9	1,826.4	1,492.1	1,305.7	1,134.0
Industrial supplies	----------	----------	----------	----------	84.0	149.3
General supplies	----------	----------	----------	----------	81.3	109.6
Construction supplies	----------	----------	----------	----------	----------	44.5
Petroleum (packaged products)	----------	----------	----------	----------	----------	14.9

TABLE 8.—*Department of Defense—Single manager for subsistence, net investment in inventories by inventory strata*

[Millions of dollars]

As of June 30—	1957	1958	1959	1960	1961	1962 (forecast)
Total	147.5	119.5	126.4	114.2	102.0	110.9
Peacetime operating stocks	100.7	65.5	82.4	77.1	78.8	75.6
Mobilization reserve stocks	31.3	30.0	32.2	24.3	21.8	22.2
Other [1]	15.5	24.0	11.8	12.8	1.4	13.1

[1] Includes intransit, stocks in hand of contractors, and unapplied issues, etc.

TABLE 9.—*Department of Defense—Single manager for medical material, net investment in inventories by inventory strata*

[In millions of dollars]

As of June 30—	1957	1958	1959	1960	1961	1962 (forecast)
Total	315.8	311.4	301.1	267.7	246.1	224.6
Peacetime operating stocks	30.9	10.7	23.4	21.1	21.9	33.4
Blood plasma	28.7	24.8	24.9	14.6	9.1	10.1
Mobilization reserve stocks	168.6	231.8	208.8	199.9	135.2	130.2
Long supply [1]	53.0	29.6	18.9	9.8	20.7	15.0
Excess	18.1		13.3	4.6	[2] 40.0	14.7
Other [3]	16.5	14.5	11.8	17.7	19.2	21.2

[1] Includes economic and contingency retention stocks.
[2] Starting with fiscal year 1961, property in the hands of disposal officers no longer included.
[3] Includes in transit, stocks in hand of contractors, unserviceable, etc.

TABLE 10.—*Department of Defense—Single manager for clothing and textiles net investment in inventories* [1] *by inventory strata*

[Millions of dollars]

As of June 30	1957	1958	1959	1960	1961	1962 (forecast)
Total	1,860.6	1,929.9	1,826.4	1,492.1	1,305.7	1,134.0
Peacetime operating stocks	251.6	354.9	252.5	250.9	268.4	225.7
Mobilization reserve stocks	753.8	909.9	973.6	769.0	586.6	606.8
Economic retention stocks	753.7	407.9	270.6	315.0	138.0	35.0
Excess	5.0	143.2	135.0	67.5	270.5	227.7
Other [2]	96.5	114.0	194.7	89.7	42.2	38.8

[1] Prior to 1962, stocks in hands of property disposal officers were carried in the stock fund until disposed; beginning in 1962 such stocks are dropped as soon as transferred to property disposal officers. The amount in 1961 was $14,400,000.
[2] Includes in transit, stocks in hand of contractors, unserviceable, in process of assembly, etc.

TABLE 11.—*Department of Defense commodity single manager program—Net investment in inventories, by quarter*

[In millions of dollars]

Date	Subsistence	Clothing and textiles	Medical material	General supplies	Industrial supplies [1]	Total
June 30, 1957	147.5	1,860.6	315.8	[2]	[2]	2,323.9
Sept. 30, 1957	[3]	[3]	[3]	[2]	[2]	
Dec. 31, 1957	[3]	[3]	[3]	[2]	[2]	
Mar. 31, 1958	[3]	[3]	[3]	[2]	[2]	
June 30, 1958	119.5	1,929.9	311.4	[2]	[2]	2,360.8
Sept. 30, 1958	106.1	[3]	310.4	[2]	[2]	
Dec. 31, 1958	126.3	1,893.1	313.2	[2]	[2]	2,332.6
Mar. 31, 1959	133.3	1,896.4	311.3	[2]	[2]	2,341.0
June 30, 1959	126.4	1,826.4	301.1	[2]	[2]	2,253.9
Sept. 30, 1959	118.5	[3]	295.9	[2]	[2]	
Dec. 31, 1959	127.3	1,673.5	289.6	[2]	[2]	2,090.4
Mar. 31, 1960	131.6	1,584.0	279.6	[2]	[2]	1,995.2
June 30, 1960	114.2	1,492.1	267.7	[2]	[2]	1,874.0
Sept. 30, 1960	103.6	1,419.7	261.7	[2]	[2]	1,785.0
Dec. 31, 1960	117.5	1,349.0	257.7	[2]	30.6	1,754.8
Mar. 31, 1961	123.4	1,349.6	253.7	79.0	87.9	1,893.6
June 30, 1961	102.0	1,305.7	246.1	81.3	84.0	1,819.1
Sept. 30, 1961	92.0	1,201.6	246.0	100.3	128.0	1,767.9
Dec. 31, 1961	122.0	1,117.8	237.4	109.1	136.0	1,722.3
Mar. 31, 1962	139.3	1,134.3	229.7	135.3	121.2	1,759.8
June 30, 1962 (estimated)	110.9	1,134.0	224.6	109.6	149.3	[4] 1,787.8

[1] Not fully implemented.
[2] Not implemented.
[3] Not available.
[4] Includes $44,500,000 of inventory for the single manager for construction supplies and $14,900,000 inventory for the single manager for petroleum (packaged products).

Source: Directorate for Statistical Services, Office of the Secretary of Defense.

TABLE 12.—*Manufacturers inventories, new orders, and unfilled orders and employment in the durable goods industries (seasonally unadjusted)*

Calendar year and quarter	Inventories, end of period (billions of dollars)	New orders (billions of dollars)	Unfilled orders, end of period (billions of dollars)	Employment, last month of period (thousands of employees)
1953:				
1st quarter	25.46	37.89	73.58	10,272
2d quarter	26.08	37.01	71.24	10,289
3d quarter	26.19	30.24	64.68	10,107
4th quarter	26.27	27.25	57.06	9,763
1954:				
1st quarter	25.63	29.13	52.14	9,329
2d quarter	24.61	29.48	46.94	9,077
3d quarter	23.45	30.15	45.00	8,898
4th quarter	24.13	33.11	44.08	9,146
1955:				
1st quarter	24.27	39.02	46.09	9,322
2d quarter	24.76	40.75	46.62	9,616
3d quarter	25.10	41.52	49.66	9,648
4th quarter	26.66	44.95	53.37	9,910
1956:				
1st quarter	28.20	43.04	55.65	9,771
2d quarter	29.30	44.34	57.33	9,811
3d quarter	29.15	41.63	60.49	9,837
4th quarter	30.59	44.34	61.02	10,085
1957:				
1st quarter	31.51	42.70	60.34	9,996
2d quarter	31.75	41.01	57.16	9,945
3d quarter	31.31	37.25	53.18	9,780
4th quarter	31.14	36.06	48.13	9,531
1958:				
1st quarter	30.16	32.97	45.06	8,825
2d quarter	28.76	35.09	43.69	8,632
3d quarter	27.75	35.78	43.58	8,885
4th quarter	27.87	40.64	44.01	9,100
1959:				
1st quarter	29.12	45.11	47.24	9,296
2d quarter	30.22	47.93	46.98	9,666
3d quarter	29.60	41.83	47.85	9,285
4th quarter	30.26	43.35	48.13	9,632
1960:				
1st quarter	32.06	44.07	46.28	9,635
2d quarter	32.18	44.21	44.50	9,522
3d quarter	31.57	41.90	44.68	9,408
4th quarter	30.81	40.72	42.85	9,036
1961:				
1st quarter	30.77	39.62	42.72	8,775
2d quarter	30.49	44.98	42.79	9,106
3d quarter	30.65	44.50	44.30	9,189
4th quarter	31.23	47.80	45.20	9,297
1962: 1st quarter (preliminary)	32.68	47.20	49.45	9,339

Source: (*a*) Department of Commerce: Survey of Current Business; (*b*) Department of Labor: Employment and Earnings Statistics.

TABLE 13.—*Manufacturers inventories, new orders and unfilled orders and employment in the aircraft and parts industry (seasonally unadjusted)*

Calendar year and quarter	Inventories, end of period (billions of dollars)	New orders (billions of dollars)	Unfilled orders, end of period (billions of dollars)	Employment, last month of period (thousands of employees)
1953:				
1st quarter	2.48	3.35	17.99	799.5
2d quarter	2.70	2.96	18.56	792.3
3d quarter	2.80	.60	16.93	812.7
4th quarter	2.96	1.81	16.44	802.0
1954:				
1st quarter	2.94	1.81	16.07	805.1
2d quarter	2.90	1.53	15.32	781.0
3d quarter	2.93	1.78	14.99	769.4
4th quarter	3.12	2.11	14.84	763.5
1955:				
1st quarter	3.02	1.63	14.20	759.7
2d quarter	3.03	1.90	13.71	748.0
3d quarter	2.98	2.32	13.81	761.0
4th quarter	3.12	4.21	15.80	788.2
1956:				
1st quarter	3.33	2.83	16.49	797.9
2d quarter	3.54	3.16	17.07	822.4
3d quarter	3.73	3.92	18.44	863.1
4th quarter	3.72	3.33	18.72	905.9
1957:				
1st quarter	3.95	2.30	18.14	927.9
2d quarter	4.09	2.13	17.16	924.1
3d quarter	4.14	1.20	15.36	886.0
4th quarter	3.90	3.11	15.24	806.5
1958:				
1st quarter	3.64	2.50	14.89	786.4
2d quarter	3.55	2.49	14.52	776.5
3d quarter	3.48	2.03	13.84	786.9
4th quarter	3.52	3.18	14.06	788.2
1959:				
1st quarter	3.63	2.25	13.43	772.6
2d quarter	3.68	3.57	13.74	755.5
3d quarter	3.65	2.60	13.02	751.0
4th quarter	3.62	3.53	13.06	723.2
1960:				
1st quarter	3.72	2.76	12.66	699.6
2d quarter	3.57	2.88	12.36	640.3
3d quarter	3.35	3.47	12.91	660.9
4th quarter	3.28	3.12	12.82	663.7
1961:				
1st quarter	3.33	2.60	12.29	668.0
2d quarter	3.23	3.34	11.93	659.9
3d quarter	3.22	3.43	12.27	671.9
4th quarter	3.15	3.06	12.07	694.2
1962: 1st quarter (preliminary)	3.19	2.86	11.49	699.7

Source: (*a*) Department of Commerce: Survey of Current Business; (*b*) Department of Labor: Employment and Earnings Statistics.

TABLE 14.—*Department of Defense—unliquidated balances of progress payments*

[Millions of dollars]

Dec. 31, 1953	4,392.0	Mar. 31, 1958	3,625.2
Mar. 31, 1954	4,547.2	June 30, 1958	3,297.4
June 30, 1954	4,347.4	Sept. 30, 1958	2,860.9
Sept. 30, 1954	4,207.4	Dec. 31, 1958	2,640.9
Dec. 31, 1954	4,437.7	Mar. 31, 1959	2,625.5
Mar. 31, 1955	4,282.9	June 30, 1959	2,200.5
June 30, 1955	4,265.3	Sept. 30, 1959	2,256.6
Sept. 30, 1955	4,192.1	Dec. 31, 1959	2,188.9
Dec. 31, 1955	4,055.1	Mar. 31, 1960	2,343.2
Mar. 31, 1956	4,221.5	June 30, 1960	2,357.6
June 30, 1956	4,469.6	Sept. 30, 1960	2,334.6
Sept. 30, 1956	3,888.8	Dec. 31, 1960	2,462.2
Dec. 31, 1956	3,816.8	Mar. 31, 1961	2,534.2
Mar. 31, 1957	3,915.8	June 30, 1961	2,528.8
June 30, 1957	4,045.5	Sept. 30, 1961	2,390.9
Sept. 30, 1957	4,070.4	Dec. 31, 1961	2,344.3
Dec. 31, 1957	3,897.0	Mar. 31, 1962	2,440.8

Prepared by the Office of the Economic Adviser, OASD (Comp.), July 4, 1962.

TABLE 15.—*Department of Defense—Fixed price type contracts and cost reimbursement type contracts as a proportion of total contract awards*

[In percent]

Fiscal years	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
Fixed price type	79.8	70.5	75.9	69.7	66.6	60.4	59.1	57.4	57.9	59.8
Cost reimbursement type	20.2	29.5	24.1	30.3	33.4	39.6	40.9	42.6	42.1	40.2

Source: Department of Defense, OASD (Installations and Logistics), Military Prime Contract Awards and Subcontract Payments.

TABLE 16.—*Department of Defense—Military prime contract awards to U.S. business firms (seasonally unadjusted) and new orders to the durable goods industries, seasonally adjusted, by quarter*

[In billions of dollars]

Quarter	Military prime contract awards to U.S. business firms, seasonally unadjusted [1]	New orders, durable goods industries, seasonally adjusted	Quarter	Military prime contract awards to U.S. business firms, seasonally unadjusted [1]	New orders, durable goods industries, seasonally adjusted
1953:			1958:		
1st quarter	7.75	37.16	1st quarter	5.19	32.88
2d quarter	10.10	35.89	2d quarter	8.53	34.50
3d quarter	2.84	31.28	3d quarter	4.34	37.55
4th quarter	1.34	27.97	4th quarter	5.71	40.78
1954:			1959:		
1st quarter	1.91	28.47	1st quarter	4.96	44.14
2d quarter	5.36	28.70	2d quarter	7.72	47.17
3d quarter	3.06	31.03	3d quarter	4.51	44.21
4th quarter	3.09	33.74	4th quarter	4.78	43.59
1955:			1960:		
1st quarter	3.12	36.57	1st quarter	5.01	43.63
2d quarter	5.67	39.50	2d quarter	7.00	43.49
3d quarter	2.04	43.40	3d quarter	5.18	42.87
4th quarter	4.93	45.05	4th quarter	4.72	40.56
1956:			1961:		
1st quarter	4.08	42.59	1st quarter	5.52	40.06
2d quarter	6.70	43.22	2d quarter	7.57	44.07
3d quarter	4.25	44.47	3d quarter	4.98	46.39
4th quarter	5.62	44.63	4th quarter	6.55	48.41
1957:			1962:		
1st quarter	4.73	42.13	1st quarter	7.26	48.62
2d quarter	4.54	40.60	2d quarter	[2] 8.50	
3d quarter	3.25	38.68			
4th quarter	4.86	35.92			

[1] Prior to fiscal year 1957 includes educational and nonprofit institutions.
[2] Estimated.

Source: Military prime contract awards: Office of Statistical Services of the Department of Defense; new orders, durable goods: Department of Commerce.

TABLE 17.—*Department of Defense—Order of magnitude data on comparative new obligational authority by functional title as if fiscal year 1963 budget structure had been adopted circa 1948, fiscal year 1953–63*

[Millions of dollars]

	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
Military personnel	12,502	11,968	11,442	11,534	11,539	11,572	11,993	12,026	12,144	13,488	13,675
Active Forces	11,921	11,266	10,650	10,526	10,411	10,398	10,709	10,637	10,695	11,898	11,948
Reserve Forces	224	315	369	512	613	607	644	674	660	670	668
Retired pay	357	387	424	495	515	567	640	715	790	920	1,059
Operation and maintenance	10,258	9,462	8,276	8,768	9,734	10,221	10,187	10,317	10,702	11,870	11,609
Procurement	21,117	10,588	7,420	9,795	11,294	10,983	14,304	11,701	11,716	15,893	16,445
Aircraft	13,948	5,041	4,922	6,923	6,559	5,945	6,167	5,929	4,998	5,795	5,488
Missiles	685	569	234	764	2,135	2,090	3,966	2,030	2,078	3,256	4,011
Ships	623	759	1,150	1,274	1,335	1,723	1,943	1,140	2,246	2,938	2,982
Astronautics											
Ordnance, vehicles, and related equipment	3,849	2,990	527	405	247	90	545	703	1,034	1,830	2,004
Electronics and communications	591	395	327	215	469	549	982	1,179	935	1,375	1,211
Other procurement	1,421	835	260	214	549	586	701	720	425	697	749
Research, development, test, and evaluation	2,426	2,165	1,708	1,828	2,185	2,345	3,777	5,620	6,033	6,283	6,843
Military construction	2,335	308	882	2,012	1,915	2,085	1,385	1,364	1,061	959	1,318
Civil defense										255	695
Revolving and management funds	360	100	1,119		75	130	57	30	30		
Total, new obligational availability	48,997	34,590	30,847	33,937	36,742	37,337	41,703	41,058	41,686	48,748	50,585
Transfers from prior year balances	−80		−60	−750	−487	−590	−535	−430	−366	−470	−445
Total, new obligational authority	48,916	34,590	30,787	33,187	36,255	36,747	41,168	40,628	41,321	48,278	50,140

NOTE.—Amounts include estimated comparability adjustments not supportable by accounting records.

TABLE 18.—*Department of Defense—Direct budget plan (TOA), new obligational authority, direct obligations and expenditures, fiscal year 1961–63*

[Millions of dollars]

	Direct budget plan (TOA)			New obligational authority			Direct obligations			Expenditures		
	1961	1962	1963	1961	1962 [1]	1963 [1]	1961	1962	1963	1961	1962	1963
Military functions:												
Military personnel	12,143	13,488	13,675	[2] 12,144	[2] 13,488	[2] 13,675	12,143	13,488	13,675	12,085	13,250	13,415
Active Forces	10,706	11,898	11,948	10,695	11,898	11,948	10,706	11,898	11,948	10,651	11,725	11,715
Reserve Forces	649	670	668	660	670	668	649	670	668	648	625	658
Retired pay	788	920	1,059	790	920	1,059	788	920	1,059	786	900	1,042
Operation and maintenance	10,671	11,870	11,609	10,702	11,870	11,609	10,671	11,870	11,609	10,611	11,595	11,511
Procurement	14,238	17,036	17,928	11,716	15,893	16,445	13,336	17,310	17,574	13,095	14,836	15,356
Aircraft	6,139	6,282	6,658	4,998	5,795	5,488	6,045	6,770	6,428	5,898	6,449	5,568
Missiles	2,954	3,653	4,075	2,078	3,256	4,011	2,456	3,898	4,094	2,972	3,523	3,899
Ships	2,281	2,938	2,982	2,246	2,938	2,982	2,207	2,410	2,866	1,801	2,049	2,308
Other	2,864	4,163	4,214	2,394	3,903	3,964	2,627	4,232	4,186	2,423	2,814	3,581
Research, development, test, and evaluation	6,366	6,300	7,147	6,033	6,283	6,843	6,165	6,389	7,045	6,131	6,039	6,650
Military construction	1,115	987	1,323	1,061	959	1,318	1,312	1,280	1,280	1,605	1,250	1,189
Active Forces	1,057	919	1,277	1,006	893	1,277	1,255	1,206	1,222	1,543	1,190	1,120
Reserve Forces	58	68	46	55	66	41	56	74	58	62	60	69
Civil defense		256	695		255	695		256	670		140	350
Revolving and management funds				30						−300	−260	−171
Subtotal	44,533	49,937	52,377	[2] 41,686	[2] 48,748	[2] 50,585	43,627	50,593	51,852	43,227	46,850	48,300
Available by transfer from working capital funds				−366	−470	−445						
Total, military functions	44,533	49,937	52,377	41,321	48,278	50,140	43,627	50,593	51,852	43,227	46,850	48,300
Military assistance	1,543	1,600	1,500	1,785	1,600	1,500	1,543	1,720	1,450	1,449	1,400	1,400
Grand total, DOD—Military (military functions and military assistance)	46,077	51,537	53,877	43,106	49,878	51,640	45,170	52,313	53,302	44,676	48,250	49,700

[1] Includes amounts proposed for separate transmittal: Fiscal year 1962, $353,000,000 under existing legislation; fiscal year 1963, $220,000,000 under proposed legislation.

[2] New obligational availability, including transfers from working capital funds.

NOTE.—Data are adjusted to reflect comparability with fiscal year 1963 appropriation structure.

TABLE 19.—*Department of Defense—Direct budget plan (TOA), new obligational authority, direct obligations, and expenditures, fiscal years 1961–63*

[Millions of dollars]

	Direct budget plan (TOA)			New obligational authority			Direct obligations			Expenditures		
	1961	1962	1963	1961	1962	1963	1961	1962	1963	1961	1962	1963
Department of the Army	10,527	12,904	12,320	10,174	[1] 12,750	12,196	10,446	12,905	12,324	10,130	11,494	12,035
Department of the Navy	12,820	15,074	15,863	12,506	14,810	15,527	12,904	14,979	15,736	12,214	13,460	14,089
Department of the Air Force	20,098	20,373	21,159	17,914	19,656	19,828	19,196	21,117	20,793	19,785	20,500	19,914
Defense agencies	1,088	1,331	2,120	1,092	1,277	2,120	1,081	1,337	2,110	1,098	1,256	1,741
Civil defense		256	695		255	695		256	670		140	350
Proposed for separate transmittal (under proposed legislation)			220			220			220			171
Subtotal	44,533	49,937	52,377	[2] 41,686	[2] 48,748	[2] 50,585	43,627	50,593	51,852	43,227	46,850	48,300
Available by transfer from working capital funds				−366	−470	−445						
Army				−260	−340	−350						
Navy				−76	−66	−25						
Air Force				−30	−64	−70						
Total, military functions	44,533	49,937	52,377	41,321	48,278	50,140	43,627	50,593	51,852	43,227	46,850	48,300
Military assistance	1,543	1,600	1,500	1,785	1,600	1,500	1,543	1,720	1,450	1,449	1,400	1,400
Grand total, DOD military (military functions and military assistance)	46,077	51,537	53,877	43,106	49,878	51,640	45,170	52,313	53,302	44,676	48,250	49,700

[1] Includes $353,000,000 proposed for separate transmittal under existing legislation.

[2] New obligational availability, including transfers from working capital funds.

TABLE 20.—*Department of Defense net expenditures for procurement and research, development, test, and evaluation, compared with sales, changes in unfilled orders, and inventories in the durable goods industries*

[Billions of dollars]

Fiscal year	Department of Defense net expenditures for procurement, research, development, test, and evaluation	Durable goods industries		
		Sales	Quarterly changes in unfilled orders	Quarterly changes in inventories
1951, total	4.74	122.02		
1st quarter	.76	28.21		
2d quarter	.85	30.19	+4.12	+1.84
3d quarter	1.33	31.44	+18.04	+1.48
4th quarter	1.80	32.18	+7.12	+1.92
1952, total	12.64	124.64		
1st quarter	2.15	29.22	+4.54	+1.40
2d quarter	2.66	31.66	+2.26	+1.25
3d quarter	3.41	31.65	+3.67	+1.13
4th quarter	4.43	32.10	+3.55	−.13
1953, total	18.54	144.29		
1st quarter	3.71	30.82	+3.75	−.41
2d quarter	4.63	36.64	−1.94	+1.03
3d quarter	4.63	37.48	+.40	+1.03
4th quarter	5.56	39.35	−2.34	+.63
1954, total	17.34	140.40		
1st quarter	4.61	36.62	−6.56	+.11
2d quarter	4.18	35.06	−7.62	+.08
3d quarter	4.44	34.05	−4.92	−.64
4th quarter	4.11	34.68	−5.20	−1.03
1955, total	14.36	142.84		
1st quarter	3.29	31.58	−1.94	−1.16
2d quarter	3.72	34.03	−.92	+.68
3d quarter	3.84	37.01	+2.01	+.14
4th quarter	3.51	40.22	+.53	+.49
1956, total	13.67	163.09		
1st quarter	3.40	38.48	+3.04	+.34
2d quarter	3.29	41.23	+3.71	+1.56
3d quarter	3.27	40.76	+2.28	+1.54
4th quarter	3.72	42.62	+1.69	+1.10
1957, total	15.34	169.85		
1st quarter	3.01	38.48	+3.15	−.15
2d quarter	3.96	43.81	+.53	+1.44
3d quarter	4.40	43.37	−.67	+.92
4th quarter	4.33	44.19	−3.18	+.24
1958, total	16.42	154.85		
1st quarter	3.97	41.23	−3.99	−.44
2d quarter	3.96	41.12	−5.05	−.17
3d quarter	3.96	36.03	−3.07	−.98
4th quarter	4.53	36.47	−1.37	−1.40
1959, total	17.14	166.16		
1st quarter	3.83	35.88	−.11	−1.01
2d quarter	4.46	40.21	+.43	+.12
3d quarter	4.24	41.87	+3.24	+1.24
4th quarter	4.61	48.19	−.27	+1.10

TABLE 20.—*Department of Defense net expenditures for procurement and research, development, test, and evaluation, compared with sales, changes in unfilled orders, and inventories in the durable goods industries*—Continued

[Billions of dollars]

Fiscal year	Department of Defense net expenditures for procurement, research, development, test, and evaluation	Durable goods industries		
		Sales	Quarterly changes in unfilled orders	Quarterly changes in inventories
1960, total	17.91	175.93		
1st quarter	4.28	40.96	+.87	−.62
2d quarter	4.72	43.07	+.28	+.66
3d quarter	4.41	45.91	−1.85	+1.80
4th quarter	4.51	45.99	−1.78	+.12
1961, total	19.09	168.97		
1st quarter	4.29	41.72	+.18	−.61
2d quarter	4.79	42.59	−1.83	−.76
3d quarter	4.88	39.75	−.13	−.04
4th quarter	5.13	44.91	+.07	−.28
1962, total				
1st quarter	4.56	42.99	+1.51	+.15
2d quarter	5.06	47.19	+.90	+.58
3d quarter	5.34	46.95	+4.25	+1.13

NOTE.—Department of Defense net expenditures for procurement and research, development, test, and evaluation include (1) the purchase of major items of equipment such as aircraft, missiles, ships, tanks, vehicles, ammunition, weapons, artillery, electronics, etc., and (2) the support of basic and applied research, general technical development, development of new weapons and equipment, fabrication and procurement of items under development for test and evaluation, and the operation and maintenance of laboratories and test facilities. These data exclude the purchase of soft goods such as subsistence, petroleum products and clothing, and organizational equipment and supplies. Amounts will not necessarily add to totals due to rounding.

Source: Department of Defense quarterly expenditure data for fiscal years 1951–53 are estimates. Annual figures for fiscal years 1951–53 and all figures for fiscal years 1954–62 are from the Department of Defense: "Monthly Report on the Status of Funds." Durable goods industries series (unadjusted) are from the Department of Commerce: Survey of Current Business.

Prepared by the economic adviser, OASD (Comptroller), July 11, 1962.

TABLE 21.—*Department of Defense obligations (orders) for procurement and research, development, test, and evaluation compared with new orders, unfilled orders, and inventories in the durable goods industries*

[Billions of dollars]

Fiscal year	Defense obligations for procurement, research, development, test, and evaluation	Durable goods industries				
		New orders received	Unfilled orders		Inventories	
			End of quarter	Changes from previous quarter	End of quarter	Changes from previous quarter
1951—Total	22.96	154.50				
1st quarter	3.72	35.92	28.07		14.93	
2d quarter	3.95	34.17	32.19	+4.12	16.77	+1.84
3d quarter	7.83	45.12	50.23	+18.04	18.25	+1.48
4th quarter	7.46	39.30	57.35	+7.12	20.17	+1.92
1952—Total	30.21	138.66				
1st quarter	6.19	33.75	61.88	+4.54	21.57	+1.40
2d quarter	5.80	33.92	64.14	+2.26	22.82	+1.25
3d quarter	7.25	35.32	67.81	+3.67	23.94	+1.13
4th quarter	10.97	35.66	71.37	+3.55	23.81	−.13
1953—Total	20.21	144.16				
1st quarter	8.89	34.57	75.11	+3.75	23.40	−.41
2d quarter	3.84	34.70	73.18	−1.94	24.43	+1.03
3d quarter	4.45	37.89	73.58	+.40	25.46	+1.03
4th quarter	3.03	37.01	71.24	−2.34	26.08	+.63
1954—Total	5.58	116.10				
1st quarter	.86	30.24	64.68	−6.56	26.19	+.11
2d quarter	.42	27.25	57.06	−7.62	26.27	+.08
3d quarter	1.12	29.13	52.14	−4.92	25.63	−.64
4th quarter	3.19	29.48	46.94	−5.20	24.61	−1.03
1955—Total	10.93	143.03				
1st quarter	2.50	30.15	45.00	−1.94	23.45	−1.16
2d quarter	4.49	33.11	44.08	−.92	24.13	+.68
3d quarter	1.68	39.02	46.09	+2.01	24.27	+.14
4th quarter	2.26	40.75	46.62	+.53	24.76	+.49
1956—Total	14.45	173.84				
1st quarter	.82	41.52	49.66	+3.04	25.10	+.34
2d quarter	3.28	44.95	53.37	+3.71	26.66	+1.56
3d quarter	4.52	43.04	55.65	+2.28	28.20	+1.54
4th quarter	5.83	44.34	57.33	+1.69	29.30	+1.10
1957—Total	16.19	169.68				
1st quarter	4.13	41.63	60.49	+3.15	29.15	−.15
2d quarter	4.44	44.34	61.02	+.53	30.59	+1.44
3d quarter	3.98	42.70	60.34	−.67	31.51	+.92
4th quarter	3.65	41.01	57.16	−3.18	31.75	+.24
1958—Total	18.71	141.37				
1st quarter	2.51	37.25	53.18	−3.99	31.31	−.44
2d quarter	4.33	36.06	48.13	−5.05	31.14	−.17
3d quarter	5.14	32.97	45.06	−3.07	30.16	−.98
4th quarter	6.73	35.09	43.69	−1.37	28.76	−1.40
1959—Total	19.51	169.45				
1st quarter	3.03	35.78	43.58	−.11	27.75	−1.01
2d quarter	5.81	40.64	44.01	+.43	27.87	+.12
3d quarter	4.77	45.11	47.24	+3.24	29.12	+1.24
4th quarter	5.91	47.93	46.98	−.27	30.22	+1.10
1960—Total	17.59	173.46				
1st quarter	3.41	41.83	47.85	+.87	29.60	−.62
2d quarter	4.40	43.35	48.13	+.28	30.26	+.66
3d quarter	4.05	44.07	46.28	−1.85	32.06	+1.80
4th quarter	5.72	44.21	44.50	−1.78	32.18	+.12

TABLE 21.—*Department of Defense obligations (orders) for procurement and research, development, test, and evaluation compared with new orders, unfilled orders, and inventories in the durable goods industries*—Continued

[Billions of dollars]

Fiscal year	Defense obligations for procurement, research, development, test, and evaluation	Durable goods industries				
		New orders received	Unfilled orders		Inventories	
			End of quarter	Changes from previous quarter	End of quarter	Changes from previous quarter
1961—Total	20.29	167.76				
1st quarter	5.18	41.90	44.68	+.18	31.57	−.61
2d quarter	4.53	40.72	42.85	−1.83	30.81	−.76
3d quarter	4.98	39.62	42.72	−.13	30.77	−.04
4th quarter	5.60	44.98	42.79	+.07	30.49	−.28
1962—Total						
1st quarter	6.15	44.50	44.30	+1.51	30.65	+.16
2d quarter	5.66	47.80	45.20	+.90	31.23	+.58
3d quarter	5.39	47.20	49.45	+4.25	32.68	+1.45

NOTE.—Department of Defense net obligations for procurement and research, development, test, and evaluation include (1) the purchase of major items of equipment such as aircraft, missiles, ships, tanks, vehicles, ammunition, weapons, artillery, electronics, etc.; and (2) the support of basic and applied research, general technical development, development of new weapons and equipment, fabrication and procurement of items under development for test and evaluation, and the operation and maintenance of laboratories and test facilities. These data exclude obligations for soft goods such as subsistence, petroleum products and clothing, and organizational equipment and supplies. Amounts will not necessarily add to totals due to rounding.

Source: Department of Defense quarterly obligations data for fiscal years 1951–53 are estimated. Annual figures for fiscal years 1951–53 and all figures for fiscal years 1954–62 are from the Department of Defense: Monthly Report on the Status of Funds. Durable goods industries series (unadjusted) are from the Department of Commerce: Survey of Current Business. Prepared by the Economic Adviser, OASD (Comptroller), July 11, 1962.

TABLE 22.—*Department of Defense—Percentage distribution of expenditures by functional title, fiscal years 1953–63 (military functions only)*

Functional title	Fiscal year 1953	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[1]	Fiscal year 1963[1]
Total expenditures	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Military personnel	27.9	28.9	32.1	32.4	29.7	29.7	28.6	28.5	28.0	28.3	27.8
Operation and maintenance	23.0	22.7	22.3	23.5	24.7	25.0	25.2	24.8	24.5	24.7	23.8
Procurement	39.7	39.6	36.1	34.2	35.1	36.1	34.9	32.4	30.3	31.7	31.8
Research, development, test, and evaluation	4.9	5.4	6.4	5.9	6.3	6.4	7.0	11.4	14.2	12.9	13.8
Military construction	4.4	4.3	4.8	5.8	5.1	4.5	4.7	3.9	3.7	2.7	2.5
Revolving and management funds	−[2]	−.9	−1.7	−1.7	−.8	−1.7	−.4	−1.0	−.7	−.6	−.4
Civil defense										.3	.7

[1] Estimated.
[2] Less than 0.1 percent.

NOTE.—Detail may not add to totals due to rounding. Data are based on order of magnitude estimates which assume that the fiscal year 1961 budget structure has been adopted circa 1948.

Source: OASD (Comptroller), FAD-396, fiscal year 1963, 1st revision, Jan. 18, 1962.

TABLE 23.—*Department of Defense—Percentage distribution of expenditures for procurement by principal subcategories, fiscal years 1953–63 (military functions only)*

Procurement	Fiscal year—										
	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962 [1]	1963 [1]
Total procurement	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Aircraft	47.3	56.9	68.6	64.1	64.1	62.4	53.6	47.0	45.0	43.5	36.3
Missiles	1.4	2.6	4.7	8.2	13.8	17.3	23.2	22.7	22.7	23.7	25.4
Ships	5.3	5.7	7.4	7.0	6.2	7.8	10.3	13.1	13.8	13.8	15.0
Ordnance, vehicles, and related equipment	27.1	20.9	9.3	10.3	5.0	2.6	2.8	3.3	5.1	7.6	11.2
Electronics and communications	5.4	4.4	3.4	5.4	5.2	4.7	5.0	8.2	8.0	8.1	7.9
Other equipment	13.4	9.5	6.7	5.0	5.7	5.1	5.1	5.7	5.4	3.3	4.3

[1] Estimated.

NOTE.—Detail may not add to totals due to rounding. Data are based on order of magnitude estimates which assume that the fiscal year 1961 budget structure had been adopted circa 1948.

Source: OASD (Comptroller), FAD-397—fiscal year 1963 (1st revision), Jan. 18, 1962.

TABLE 24.—*Department of Defense—Unliquidated balances of progress payments and advance payments compared with guaranteed loans outstanding, fiscal years 1957, 1958, 1959, 1960, 1961, and 1962*

[Millions of dollars]

Fiscal year	Unliquidated balances of progress payments	Unliquidated balances of advance payments	Guaranteed loans outstanding	Fiscal year	Unliquidated balances of progress payments	Unliquidated balances of advance payments	Guaranteed loans outstanding
1957—July	4,280.8	33.0	344.2	1960—July	----------	----------	277.1
August	3,885.6	29.5	330.9	August	----------	----------	285.0
September	3,888.8	29.4	349.3	September	2,256.6	41.5	298.4
October	3,929.9	35.3	343.4	October	----------	----------	296.5
November	3,930.9	29.6	354.3	November	----------	----------	299.0
December	3,816.8	44.0	367.7	December	2,188.9	36.9	298.0
January	3,853.7	46.1	378.4	January	----------	----------	----------
February	3,957.2	42.8	375.9	February	----------	----------	----------
March	3,915.8	39.5	385.8	March	2,343.2	40.6	316.7
April	4,025.4	54.8	377.4	April	----------	----------	----------
May	4,103.1	49.4	379.4	May	----------	----------	----------
June	4,045.5	40.2	383.4	June	2,357.6	43.6	267.8
1958—July	4,037.6	55.2	378.5	1961—July	----------	----------	----------
August	4,102.9	53.6	354.8	August	----------	----------	----------
September	4,070.4	46.9	358.4	September	2,334.6	44.3	254.5
October	4,056.1	57.8	360.0	October	----------	----------	----------
November	4,075.1	48.7	353.2	November	----------	----------	----------
December	3,897.0	43.9	351.3	December	2,462.2	43.7	261.4
January	3,789.1	52.9	332.5	January	----------	----------	----------
February	3,709.8	48.5	322.2	February	----------	----------	----------
March	3,625.2	45.2	315.6	March	2,534.2	47.1	235.9
April	3,481.3	54.7	292.9	April	----------	----------	----------
May	3,440.1	51.1	275.3	May	----------	----------	----------
June	3,297.4	44.5	276.2	June	2,528.8	56.4	228.4
1959—July	3,237.9	47.1	247.7	1962—July	----------	----------	----------
August	3,214.6	48.6	246.0	August	----------	----------	----------
September	2,860.9	48.4	245.1	September	2,390.9	62.4	177.2
October	2,733.2	51.7	251.6	October	----------	----------	----------
November	2,626.7	48.1	251.1	November	----------	----------	----------
December	2,640.9	47.9	259.1	December	2,344.3	61.1	135.2
January	----------	----------	273.2	January	----------	----------	----------
February	----------	----------	278.6	February	----------	----------	----------
March	2,625.5	50.5	286.0	March	2,440.8	58.9	129.2
April	----------	----------	266.4				
May	----------	----------	265.6				
June	2,200.5	36.0	270.9				

NOTE.—Beginning with calendar year 1959, reporting was continued on a quarterly basis only.

Source: Prepared by the Economic Advisor, OASD (Comptroller), Department of Defense.

TABLE 25.—*Department of Defense unpaid obligations (outstanding orders) for procurement and research, development, test, and evaluation compares with unfilled orders (backlog) and employment in the durable goods industries (end of period)*

Fiscal year	DOD unpaid obligations for procurement and R.D.T. & E.	Durable goods industries		Fiscal year	DOD unpaid obligations for procurement and R.D.T. & E.	Durable goods industries	
		Unfilled orders	Total employees [1]			Unfilled orders	Total employees [1]
1954:	*Billions*	*Billions*	*Thousands*	1958—Continued	*Billions*	*Billions*	*Thousands*
1st quarter	$40.44	$64.68	10,107	3d quarter	$18.36	$45.06	8,825
2d quarter	34.06	57.06	9,763	4th quarter	20.27	43.69	8,632
3d quarter	30.27	52.14	9,329	1959:			
4th quarter	28.68	46.94	9,077	1st quarter	19.12	43.58	8,835
1955:				2d quarter	19.42	44.01	9,100
1st quarter	27.70	45.00	8,898	3d quarter	19.39	47.24	9,296
2d quarter	28.36	44.08	9,146	4th quarter	20.37	46.98	9,666
3d quarter	24.47	46.09	9,322	1960:			
4th quarter	21.81	46.62	9,616	1st quarter	18.90	47.85	9,285
1956:				2d quarter	18.09	48.13	9,632
1st quarter	18.79	49.66	9,648	3d quarter	17.60	46.28	9,635
2d quarter	18.59	53.37	9,910	4th quarter	18.62	44.50	9,522
3d quarter	19.50	55.65	9,771	1961:			
4th quarter	20.59	57.33	9,811	1st quarter	19.22	44.68	9,408
1957:				2d quarter	18.66	42.85	9,036
1st quarter	21.03	60.49	9,837	3d quarter	18.53	42.72	8,775
2d quarter	21.63	61.02	10,085	4th quarter	18.51	42.79	9,106
3d quarter	21.27	60.34	9,996	1962:			
4th quarter	20.04	57.16	9,945	1st quarter	19.85	44.30	9,189
1958:				2d quarter	20.13	45.20	9,297
1st quarter	18.21	53.18	9,780	3d quarter (preliminary)	19.82	49.45	9,339
2d quarter	18.03	48.13	9,531				

[1] Average employment for last month of quarter.

NOTE.—Department of Defense unpaid obligations for procurement, and research, development, test and evaluation include (1) the purchase of major items of equipment such as aircraft, missiles, ships, tanks, vehicles, ammunition, weapons, artillery, electronics, etc., and (2) the support of basic and applied research general technical development, development of new weapons and equipment, fabrication and procurement of items under development for test and evaluation, and the operation and maintenance of laboratories and test facilities. The data exclude unpaid obligations for soft goods such as subsistence, petroleum products, and clothing and organizational equipment and supplies.

Source: Department of Defense fiscal data are from the Department of Defense: Monthly Status of Funds. Durable goods industries unfilled orders data are from the Department of Commerce: Survey of Current Business. Durable goods industries employment data are from the Department of Labor: Monthly Labor Review.

Prepared by the Economic Adviser, OASD (Comptroller), July 10, 1962.

Representative REUSS. In that last statement of yours, Mr. Hitch, that the possibilities of varying the pace of the defense program in a countercyclical manner are quite limited, do you refer both to inventories held by the Government and inventories held by contractors?

Mr. HITCH. Yes, sir; and I was also referring, Mr. Chairman, to other measures that could be taken, changes in particular in the rate of contract placement which would have an indirect effect on inventories.

Representative REUSS. As far as direct inventory policy is concerned, either on the part of the Government or on the part of defense contractors, I get the general sense out of your statement that you think it is not only quite limited but practically nonexistent.

Mr. HITCH. And undesirable.

Representative REUSS. And undesirable.

So that you think it is pretty close to zero as a countercyclical device?

Mr. HITCH. Pretty close to zero.

Representative REUSS. You didn't quite say so in these words, but I am wondering whether this may not be what you are afraid of.

If you adopted a policy of saying, "Let the Defense Department contribute to the built-in stabilizers by its inventory policy as regards its own inventories," you might overbuy in periods of economic ebb, but in a subsequent period of full employment and inflationary pressures, you might not be able to underbuy enough, so inventories would tend to exceed the level you are now attempting to maintain. Is this the essential problem?

Mr. HITCH. That is certainly a problem.

Representative REUSS. Is that true?

Mr. HITCH. It is accentuated by the fact that so many of the defense suppliers are specialized in military production, so that if we cut them down, they have no other short-term alternatives.

Representative REUSS. So that your cutting them down might be justified in a full employment situation from an overall economic standpoint, but it would be very rough on those who got cut down?

Mr. HITCH. It would be very painful on the industries and communities.

Representative REUSS. Mr. Widnall?

Representative WIDNALL. No questions at this time.

Representative REUSS. Senator Pell?

Senator PELL. Mr. Hitch, one question on your organization in the Defense Department. As I understand it you are the Assistant Secretary of Defense for fiscal affairs and the Comptroller; is that correct?

Mr. HITCH. That is correct, sir.

Senator PELL. And then similar slots exist in the subordinate departments, Army, Navy, and Air?

Mr. HITCH. That is correct.

Senator PELL. Why is it that in some of those departments the slots are filled, and in the Navy, to be specific, this slot has not been filled since the new administration came into power?

Mr. HITCH. It is true that the Navy has never filled that slot. They made one or two nominations which have not been presented to the Congress. I believe they are trying very hard to fill that slot at the present time, but it has not been filled since the new administration came into office.

Senator PELL. But the Army is filled. Is the Air Force filled?

Mr. HITCH. Yes; it is.

Senator PELL. There is no reason or policy why it should not be filled?

Mr. HITCH. No; none whatever.

Senator PELL. Is there any comparison of the inventory supplies held by the Defense Department with the total inventories held by private industry? Has any such study been made?

Mr. HITCH. The total held by private industry?

Senator PELL. Yes.

Mr. HITCH. There have been such studies.

Senator PELL. Roughly what would be the relationship of the inventories in defense stocks versus those in total private industry?

Mr. HITCH. There would be a difficult problem of comparability.

Senator PELL. That is right. It would have to be very rough.

Mr. HITCH. And it would have to be very rough. We don't know—in fact, no one knows very accurately—the value of all the property in the United States and who owns it.

Senator PELL No; I am thinking in terms of industrial inventories as opposed to defense.

Mr. HITCH. You are thinking just in terms of stocks?

Senator PELL. Yes; that is what I am talking about.

Mr. HITCH. That would be much easier.

Senator PELL. Do you have any idea, offhand?

Mr. HITCH. Actually, you have some Department of Commerce witnesses——

Representative REUSS. We had Mr. Paradiso.

Mr. DARLING. This afternoon we have a statistical session where this data would be readily available.

Mr. HITCH. The Department of Commerce would be the place to get the answer to this question.

Mr. DARLING. The total stocks held manufacturing and trade inventories in this country as reported by the Department of Commerce are somewhat over $100 billion.

Mr. HITCH. That would probably be comparable not to the personal property but the supply system inventories of the Defense Department.

Senator PELL. You have about 6 billion.

Mr. HITCH. Actually, even that is not a very comparable figure because it includes our mobilization reserve. I suppose that it would be better to compare it to the peacetime operating stocks of the Department, which are about $15 billion.

Senator PELL. So very rough curbstone opinion is that the total defense inventory is about 15 percent of the total industrial inventory of the United States?

Mr. HITCH. It would so appear.

Senator PELL. Carrying that thought through a step further, is there any study or relationship that you know of between the variations within the defense inventories and the variations in industrial inventories?

Mr. HITCH. You mean the rate of turnover?

Senator PELL. Yes.

Mr. HITCH. Of the respective inventories?

Senator PELL. Yes.

Mr. HITCH. I am not familiar with such a study.

Senator PELL. I didn't know that there has been one made.

Mr. HITCH. I would be glad to see if there is any information on that. It would be an interesting comparison to make, but a difficult one, because again we have the problem that part of our inventory is being held for mobilization reserve requirements and not for every day operations.

(The following was submitted by the Department of Defense.)

Inventories of personal property in the Department of Defense are not established for the sole purpose of peacetime turnover as are private industry inventories, and hence cannot be favorably compared. Military inventories are established to fill a worldwide pipeline, to position war reserve stocks which may be rotated but not drawn down, and finally to support the daily operations. It is only the last segment which is meaningful in this context. Finally, it should be noted that private industry maintains inventories in anticipation of sales; the Department of Defense maintains inventories in anticipation of consumption.

Although there appears to be little basis for a meaningful comparison of inventory turnover ratios between the Department of Defense and private industry in general, it should be noted that turnover ratios are regularly used as an internal management tool in the Department of Defense for controlling the level of our peacetime operating stocks.

Senator PELL. Thank you.

Senator REUSS. Mrs. Griffiths?

Representative GRIFFITHS. Are you buying spare parts for airplanes under a single-manager system?

Mr. HITCH. No, we are not.

Representative GRIFFITHS. No.

How exact is your knowledge of the inventory of spare parts currently?

Mr. HITCH. For airplanes?

Representative GRIFFITHS. Yes.

Mr. HITCH. It is not very exact, that is, my own personal knowledge. However, we do believe that our inventory data on aircraft spares are quite good now.

Representative GRIFFITHS. Do you maintain some sort of a card file on spare parts or not?

Mr. HITCH. Each of the services does maintain control over its aircraft spares inventories.

Representative GRIFFITHS. Are they priced in lots, in sets, or by the part?

Mr. HITCH. Or by the what?

Representative GRIFFITHS. Are these priced in lots, in sets, or by the part?

Mr. HITCH. I can't answer this question in detail. I expect it varies from service to service.

(The following was later submitted by the Department of Defense:)

In general, aircraft spare parts are counted in lots and priced by unit price for inventory purposes. Certain high-value, repairable items, however, are priced by the part.

Representative GRIFFITHS. I observed the single manager system on some things.

One of the things that impressed me was that with all the knowledge they had of where the parts were and how many parts they had on various items, they never maintained any price on the cards which could easily have shown the last price paid or all prices that have ever been paid for anything that has ever been purchased but price was not ever considered. It seems to me that is a weakness in this inventory which I would think would give you a much better control.

Mr. HITCH. I would certainly agree we should have monetary inventory measurements as well as item measurements.

Representative GRIFFITHS. Yes.

I think it would be a big saving for the Government. At least your purchasers could look back on it.

You mentioned the incentive-type contract. Is that contract the one where the contractor estimates the cost, what it is going to cost him, and if he goes below that he gets part of the savings himself?

Mr. HITCH. There are a great many different kinds of incentive contracts.

Representative GRIFFITHS. Yes.

Mr. HITCH. But in general, an incentive contract does specify certain target costs, certain target dates of delivery, and certain target performance characteristics of what is being delivered, and the rate of profit earned by the manufacturer depends upon how well he meets these various targets—costs, time, and performance.

Representative GRIFFITHS. Have you ever made a study to determine how many times on such contracts they have failed to meet the targets and been penalized?

Mr. HITCH. Yes; well—

Representative GRIFFITHS. You do have?

Mr. HITCH. Oh, yes.

Representative GRIFFITHS. Would you supply me with some information on this, on how many times they failed to meet it?

Mr. HITCH. I would be very happy to.

Representative GRIFFITHS. And how many times they have increased their profit?

Mr. HITCH. How many times they have increased their profit?

Representative GRIFFITHS. I mean how much additional money has been paid in profit and how many times they have been penalized.

Mr. HITCH. Additional to what? Do you mean additional to what they would get if they just met the targets?

Representative GRIFFITHS. Yes, yes.

Mr. HITCH. I would be very happy to supply you with such information.

(The information requested is as follows:)

The questioning, both above and immediately below, concerns the broad question of the desirability of the use of the incentive-type contracts, and the specific question of the history of contracts in which the contractor performed at less and more than the target costs. The following discussion details the reasons why the incentive-type contract is both desirable and essential for today's Defense Department procurement program, and indicates the state of acceptance by such governmental organizations as the Renegotiation Board and the General Accounting Office. The specific question of contracts in which final costs were below and above targets is answered on page 163. Charts which show both the absolute dollar amounts and the percentage variation between target costs and final actual costs can be found on pages 164 and 165.

USE OF INCENTIVE CONTRACTS

In fiscal year 1953, missiles and electronics represented less than 12 percent of our annual hard-goods deliveries. Last year these items constituted almost 52 percent of our hard-goods contracts. During the same era, annual obligations for research and development have risen from $2.4 billion to the level of almost $7 billion budgeted for fiscal year 1963.

Accompanying the swing away from mass production weapons, there has been a rapid decline in use of fixed-price contracts, and a proportionate increase in the use of cost-plus-fixed-fee contracts as shown by the following:

[In percent]

Type of contract	Fiscal year 1951	Fiscal year 1961
Fixed-price	78	47
Incentive	9	14
Cost-plus-fixed-fee	13	39

It is noted that weapons programs of the type which have emerged during the past decade have typically involved very large awards not subject to direct price competition, with the resultant contract being made on some form of cost-reimbursement basis.

In 1961 $8.9 billion in contract awards were made under the CPFF type of contract. Recent studies of experience under such contracts show actual costs frequently exceed target costs by as much as 20 percent with many programs running much higher. Thus hundreds of millions of dollars of reimbursed costs are in excess of those anticipated at the outset of the contract. Much of this is sheer waste.

It is the judgment of our best informed policy executives that a significant part of these cost overruns is a direct result of the fact that risks are not being shared equitably by the Government and the contractor—because such contracts provide a fee which does not vary, and which thus fails to discriminate between good performance and bad, between early successful completion and protracted failure, or between tight management control of costs and waste. The findings of the recent report to the President on research and development contracting made the following findings on this subject:

"* * * This type of contract has well-known disadvantages. It provides little or no incentive for private managers to reduce costs or otherwise increase efficiency. Indeed, the cost-plus-fixed-fee contract, in combination with strong pressures from governmental managers to accomplish work on a rapid time schedule, probably provides incentives for raising rather than for reducing costs. If a corporation is judged in terms of whether it accomplishes a result by a given deadline rather than by whether it accomplishes that result at minimum cost, it will naturally pay less attention to costs and more attention to speed of accomplishment. On the other hand, where there is no given deadline, the cost-plus-fixed-fee contract may serve to prolong the research and development work and induce the contractor to delay completion."

To sharply reduce the use of such contracts we issued, on March 15, 1962, a complete revision of the Armed Services Procurement Regulation (sec. III, pt. 4). This revision establishes the firm fixed-price contract as the most preferred type, because here the contractor accepts full cost responsibility, and the relationship between cost control and profit dollars is established at the outset of the contract. This regulation limits the use of cost-plus-fixed-fee contracts to basic research or study contracts or a few development contracts where the unknowns are so great that feasibility cannot be clearly established.

In all other cases—which will apply to most future contracts for the development and overlapping production of new weapons systems—we have established the objective of employing incentive contracts which will have these features:

Establishment, in advance of contracting, of specific goals for the required performance of the weapon, for the time of completing the development, and for its costs.

These goals will be incorporated in such contracts and there will be provision for an increase in fee if the goals are exceeded, and a decrease if they are not met.

To encourage maximum sharing of risk, the penalty applied for failure or poor performance will be as great as the reward for superior performance. An application of these new principles to a major program is now in process. It provides for an incentive fee ranging from zero (meaning an out-of-pocket cost to the contractor) to the maximum fee allowed by law of 15 percent.

In the early development of new weapons, only a fraction of the incentive will hinge on cost. For example, in a missile, performance factors (such as range, payload, accuracy, and reliability) might constitute about one-half of the incentive, and time of completion another one-third. That portion of fee based on cost reduction would then contribute only one-sixth. However, by the time development has reached the stage of production for test, performance, and time might be expected to control about half the fee, and costs incurred the remaining half.

As you can see, we would now hinge our incentive arrangements around targets having to do with the quality and timeliness of performance as well as the cost of performance until we had reached a state in development where quality and timeliness were assured. In this respect our present practice differs from the practice of some years ago when we frequently went to straight cost reduction incentives before we had completed the development.

During recent years the estimating of target costs has become increasingly more precise because such negotiations are preceded by more intensive price and cost analyses.

We have just completed a review of the incentive contracts settled before and after fiscal year 1959 which revealed the following:

[In percent]

Contracts settled between—	Percent of final costs falling below target	Percent of final costs falling above target
1954 and 1959	64.6	35.4
1959 and 1961	51.0	49.0

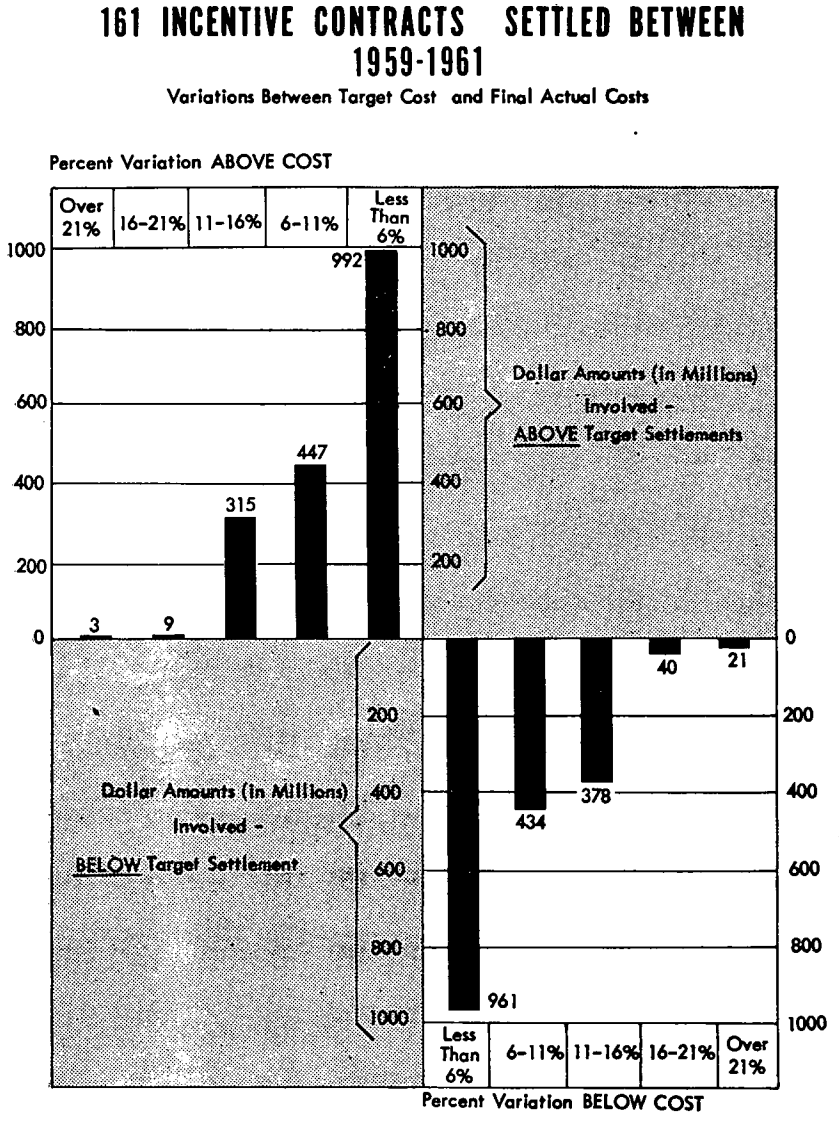
We conclude that the relatively even spread of final costs, in the 1959–61 contracts, above and below targets is a clear indication of a satisfactory advance analysis by the Government of cost risks, and the negotiation of a reasonable distribution of those risks between the contractor and the Government.

Under a revised approach to weapons development contracting, contractors will be invited to submit competitive proposals citing the incentive plan under which they are willing to undertake the development. Thus, contractors submitting unduly conservative proposals, which involve little or no risk, will endanger their competitive position. Conversely, contractors who are unduly optimistic in their promises will be in danger of being awarded the contract at a very low profit or even a loss. Accordingly, it can be expected that these arrangements will compel more clarity and integrity in the preparation and submission of proposals for development contracts.

We have thoroughly reviewed our plans for expanding the use of incentive contracts with the Bureau of the Budget, the Renegotiation Board, and the General Accounting Office. We were pleased to note the comments of Mr. Charles M. Bailey of the GAO that "Under appropriate circumstances we believe the use of incentive type contracts is proper and can effectively serve the best interests of the Government." On April 17, 1962 Chairman Lawrence Hartwig of the Renegotiation Board issued a press release which contained the following statement:

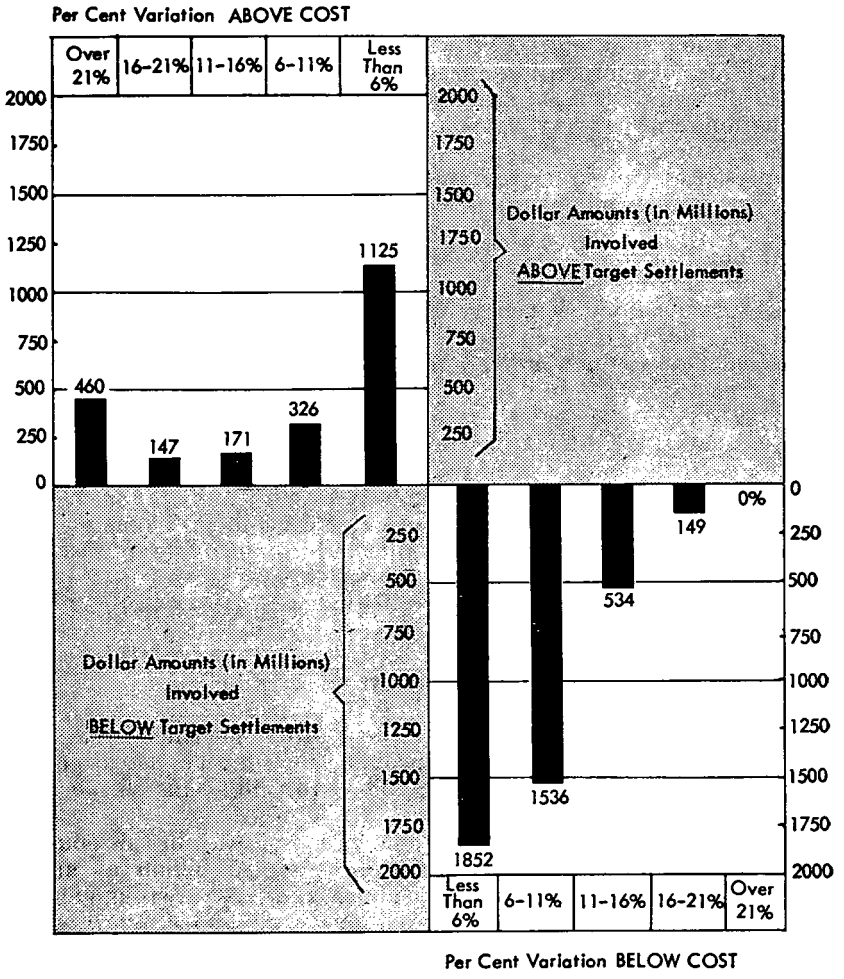
"The Renegotiation Board has followed with interest the formulation of the Department's incentive program, and recognizes its objectives. The Board understands that the new program represents an expansion and modification of past incentive arrangements. The Board is aware that the Department hopes to achieve its aim of greatly reducing the cost of new weapons, improving their quality and speeding their development, by encouraging and rewarding performance efficiency and by penalizing inefficiency. The Board believes that the Renegotiation Act does not impede the proper accomplishment of these objectives."

We believe that we are capable of protecting the Government's interest in negotiating incentive contracts and that, once negotiated, they provide the contractor with very strong motivation for performing the contract in a manner that will be most advantageous to the Government.


161 INCENTIVE CONTRACTS SETTLED BETWEEN 1959-1961
Variations Between Target Cost and Final Actual Costs
Percent Variation ABOVE COST
Over 21%
16-21%
11-16%
6-11%
Less Than 6%
1000
800
600
400
200
0
3
9
315
447
992
Dollar Amounts (In Millions) Involved - ABOVE Target Settlements
Dollar Amounts (In Millions) Involved - BELOW Target Settlement
961
434
378
40
21
Less Than 6%
6-11%
11-16%
16-21%
Over 21%
Percent Variation BELOW COST

120 INCENTIVE CONTRACTS SETTLED BETWEEN 1954-1959

Variations Between Target Cost and Final Actual Costs



Representative GRIFFITHS. Because my personal opinion is that that type of an incentive contract is really an incentive to the contractor to lie in the original bid, and I have made this statement repeatedly and I have found that Mr. Campbell has agreed, and has shown specific instances where it happened, I listened the other day to the Renegotiation Board and they explained that in general this has resulted in increased profits being paid.

Mr. HITCH. Mrs. Griffiths, I would certainly agree that this type of contract gives the contractor a strong incentive to get the target cost just as high as he can.

Representative GRIFFITHS. As high as possible, right?

Mr. HITCH. However, there are some offsetting considerations. We have the incentive to get it as low as we can, and we can use some of the forces of competition in our competitive bidding procedures to help us determine what are reasonably low target costs and reasonable production, and delivery dates and what are reasonable performance characteristics.

Representative GRIFFITHS. But you hamstring yourselves so much. You just announced that you don't have these items priced part by part.

You don't have a record of what the prices are, part by part. And I am sure you don't.

It is just not done that way.

Mr. HITCH. Well, of course, for the most part here we are dealing with contracts for new items and materiel which will contain many new parts, for which no one will know for sure just what the cost of production is.

Representative GRIFFITHS. But even on the modest ones and even on the ones which have been purchased for 100 years you still don't have the pricing part by part, year by year.

Mr. HITCH. Well, there are serious and difficult problems in fixing reasonable prices, delivery dates, and performance characteristics in this kind of contract.

But I think it is just very important that we learn to do this better, because I think this is our principal hope for getting away from reliance on the cost-reimbursement type of contract.

Representative GRIFFITHS. Thank you very much.

Representative REUSS. Dr. Darling.

Mr. DARLING. Mr. Hitch, the purpose of our hearings is to try to see what possibilities exist for improving our countercyclical policies in this country in a broad sense. The problem seems to me to be substantial.

For example, if we look at all nonfarm inventories in this country, inventory investment has shifted from about 5 billion at annual rate on the plus side in early 1956, to about, and these are rough figures, to about minus 5 billion, by approximately the end of 1957, which, of course, was a swing of $10 billion in purchasing power in the country.

This seems to me to be substantial and it has an influence then on levels of income in the country and the total effect may even exceed this direct effect.

Now, the question comes up as to how large this stabilization possibility is or how limited it is with respect to the Defense Department. I don't think that the committee feels, after your statement, that the total solution lies in countercyclical use of defense procurement by any means.

The question is, is there a contribution there that could be made, however small, that is worth probing and considering, and, therefore, I would like to ask several questions to try to pinpoint just how large this is.

I think we are interested mainly in what you might call the marginal effect, that is to say, if there is a shift that can be made, a speedup in procurement of relatively small amounts, relative to the total GNP, it might be relatively important in the terms of its marginal effect in the economy.

With that in mind, on page 11 of your statement you say near the bottom of the page, the last paragraph:

> For example, a 10-percent increase in all stock fund inventories would mean a one-time increase in procurement of about $650 million.

If that represents a range of possibility of variation, and if that $650 million increase or decrease, whichever it might be, occurred in one quarter of the year, that would be about $2.6 billion of change on an annual rate basis which might have a considerable impact on the inventory cycle.

Would you evaluate this statement in terms of your understanding of the possibility there?

Mr. HITCH. Yes. I don't think a 10-percent increase in one quarter would be at all feasible.

Mr. DARLING. It would not be?

Mr. HITCH. Yes. In the single manager stocks, as you will see on chart 8, the great bulk consists of clothing. That is much the largest item.

You just could not conceivably lay in that much larger stocks of clothing or anything remotely approximating a 10-percent increase for this in a single quarter. I mean it would be quite silly if you did. As for other inventories—a great deal of the stocks not shown on chart 8 have much longer leadtimes, so that anything of that order would not be possible in a quarter.

As I pointed out, in the three cases in which administrations have attempted over the last few years to accelerate defense procurement for economic reasons, we haven't been able to find the influence in the stock levels at all.

Mr. DARLING. In the record of stock levels in the Defense Department?

Mr. HITCH. In the record of stock levels.

Mr. DARLING. But on one of the charts—and I can't remember which one it is—you do show that acceleration of defense procurement in, I think it was early 1958, did, by the association shown on the chart with orders in the durable industries, apparently had some influence on that recovery.

Would you agree with that?

Mr. HITCH. That, I think, is the more relevant question. If we can get out a lot of additional orders on the durable goods industries, that is a considerable factor.

Mr. DARLING. What kind of acceleration was it at that time? What source of goods were being ordered?

Mr. HITCH. This was 1957–58?

Mr. DARLING. Yes; the acceleration in early 1958. Could that be repeated in other cycles?

Mr. HITCH. I think it was fairly general. I would have to check the records on this to see just what was being ordered.

But in 1961–62, where we had another and larger acceleration, almost all types of defense goods were affected. Aircraft shows the effect perhaps least of all, but all types were affected, and that had a very substantial effect on new and unfilled orders in the durable goods industries.

Now, I have drawn a contrast between this type of measure which the Defense Department can take and measures directly relating to inventories and stocks.

Mr. DARLING. Yes.

Perhaps our problem is better stated in terms of the flow of defense procurement than in terms of the stocks held by the Defense Department.

Mr. HITCH. I think it is.

Mr. DARLING. May I ask a question with respect to chart——

Mr. HITCH. That flow can be accelerated to some extent. We did it last spring, to the extent of about $600 million.

Mr. DARLING. Is there an established policy in the administration to use defense procurement as a stabilization device?

Mr. HITCH. No; I would say that there is no set policy. In the acceleration of contract placements that the administration embarked upon in the spring of last year, the Defense Department was included with the other departments of Government. We were asked, within the limit of the obligational authority that we had, to step up the rate of contract placement by placing contracts sooner rather than later wherever it made sense and was feasible.

Mr. DARLING. If such a policy were established, however small the range of possibilities might be, would the establishment of such a policy and the forewarning it might give the Department of Defense make it more feasible to use defense procurement as a stabilizing offset?

Mr. HITCH. I suppose the answer to that question is "Yes." I have very mixed feelings about the policy. I am sure that there are certain kinds of contract placements in almost any situation that we could somewhat accelerate with no adverse effects on our military posture. But it is troublesome to introduce additional criteria to the people who are managing these programs.

There may be very good reasons, for example, to delay a contract placement on new aircraft, because you are having great difficulty deciding just what the characteristics of that aircraft should be.

Now, if we were told to hurry up for economic reasons, I think there is a danger that we may make a poor decision, by precipitating a decision earlier than it should be made. It is very hard to draw the line between this kind of case and the kind of case where it is completely legitimate to do it.

Mr. DARLING. May I ask an additional question?

On chart 4 in the supply system inventory, I believe this is, you spoke, Mr. Hitch, of economic—no, contingency retention stocks, I believe, and economic retention stocks. I think my question deals with both these categories or perhaps only one.

Mr. HITCH. They are very similar categories.

Mr. DARLING. The use of the word "contingency" suggests that there is room for some flexibility, at least in the interpretation as to how necessary they are. Within that category, which is fairly large,

it looks, just roughly, $7 or $8 billion, does that represent the kind of stocks, of inventory stocks, held by DOD where because of the contingent nature of them as to necessity, where there is some flexibility for variation of the amounts, that you might hold that would better harmonize with economic stability?

Perhaps I do not understand the items that are in that category.

Mr. HITCH. Well, let me say that both of these categories contain items which would never have been bought if we could have foreseen the future perfectly. They are items which have been bought and have become obsolete or otherwise excess or surplus or are in "long supply" with respect to our needs as we now see them.

However, they have been bought and they are in our inventory. We can see some possiblity of situations arising in which they would be needed, so we retain them.

In many cases we can get virtually nothing for them if we dispose of them. Having bought them, it just seems to us that it makes more sense in these cases to continue to keep them, with very low storage costs, than it is to dispose of them. And we classify them by these two names.

(The following additional explanatory material was furnished by the Department of Defense:)

The inventory stratification accounts are defined as follows:

(*a*) Peacetime operating stock is that portion of the total quantity of an item on hand which is required to equip and train the planned peacetime forces and support the scheduled establishment through the normal appropriation and lead-time periods.

(*b*) Mobilization reserve stock is that portion of the total quantity of an item on hand which is designated to meet the mobilization reserve materiel requirement. Included are pre-positioned stocks held in specific locations in condition for immediate shipment or use on or after M-day.

(*c*) Economic retention stock is that portion of the quantity in long supply which it has been determined will be retained for future peacetime issue of consumption as being more economical than future replenishment by procurement.

(*d*) Contingency retention stock is that portion of the quantity in long supply of an obsolete or nonstandard item for which no programed requirements exist and which normally would be considered as excess stock, but which has been determined will be retained for possible military or Defense contingencies.

(*e*) Excess stock as reported herein is stock which is indicated to be above the sum of (*a*), (*b*), (*c*), and (*d*), above, and for which specific determination as being within the needs of the holding activity has not been made or disposal action initiated.

In-transit stock is that owned by a military service, which is en route (*a*) from manufacturers or suppliers; (*b*) from U.S. depots to oversea commands or vice versa; (*c*) from U.S. depots to U.S. commands or vice versa; and (*d*) between U.S. depots, and which has not been received by the consignee.

Mr. DARLING. I have just one more question. With respect to the 1957 cutback in defense procurement, some economists, and I think this is suggested in your statement, too, say that this cutback in procurement influenced the course of economic activity and was a factor, perhaps not the entire factor by any means, in the business downturn in 1957.

My question here is where a quite major change in defense policy and procurement is to take place, especially a curtailment of procurement, is it normal procedure to clear such decisions made by the Defense Department with an agency of Government which is concerned with the overall state of the economy at the time, through, perhaps, some presidential office?

Mr. HITCH. Yes. Of course. I was not here at that time and I couldn't tell you what happened, but I am confident this cutback of 1957, and all of the measures taken by the Defense Department associated with it, were thoroughly discussed with the White House, the Bureau of the Budget, the Treasury, and so forth.

Mr. DARLING. Mr. Chairman, I have no further questions.

Representative REUSS. Thank you.

Representative WIDNALL. Just one question, Mr. Chairman.

Representative REUSS. Mr. Widnall.

Representative WIDNALL. On your chart No. 2 you have an item "Other personal property" included in 1961 not included in other years.

Mr. HITCH. Yes.

Representative WIDNALL. What is the reason for that?

Mr. HITCH. I think that these are some—I am sorry, I had better look this up and provide it for the record.

Representative WIDNALL. I was wondering why it had not been included in other years. Have you taken this item into account previously?

Mr. HITCH. There have been changes in coverage almost every year, both in total coverage and in the breakdown. I cannot tell you offhand what is included in that category.

Representative WIDNALL. Will you submit that for the record?

Mr. HITCH. Yes, sir.

(The information referred to follows:)

"Other personal property" shown on chart 2 reflects the inclusion in the inventory, for the first time in 1961, of about $1.5 billion of Air Force property provided contractors.

Representative WIDNALL. In 1957 there are two blanks at the top of the column. Is that a misprint?

Mr. HITCH. That is a misprint. The very top area, the very small one, is industrial fund inventories, and the one below it is excess, surplus——

Representative WIDNALL. Plant equipment.

Mr. HITCH. I am so sorry, "Plant equipment, including machine tools."

Representative WIDNALL. That is all, thank you.

Representative REUSS. Thank you very much, Mr. Hitch. We appreciate your help.

The next witness before us will be Mr. Murray L. Weidenbaum of the Boeing Co.

You have a prepared statement, Mr. Weidenbaum. We would be glad to have you proceed in your own way. I note that the views you express are personal and are not those of the Boeing Co. and they will be so received.

STATEMENT OF MURRAY L. WEIDENBAUM, CORPORATE ECONOMIST, THE BOEING CO., SEATTLE, WASH.

Mr. WEIDENBAUM. Thank you, sir.

I very much appreciate the opportunity to appear before this committee.

My testimony will be concerned with the fact that a portion of business inventories arise from production under Government contract,

and that this autonomous Government demand may be relatively insensitive to changes in general business conditions.

I will attempt to indicate some general characteristics of the movements of inventories held by Government producers and to explore the statistical problems involved.

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.

However, the actual amount of this private production on Government account cannot be separately identified in the available statistics because the various inventory questionnaires simply do not request a breakdown between Government orders and private orders.

When the 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. This relates to the timing of the economic impact of the Government procurement.

Progress payments which are made by the Government to the contractor during the course of production do not alter the above relationships. Government purchases are recorded in the national income accounts when the deliveries are made, regardless of the timing of payments.

In this regard, Government purchases lag behind budget expenditures or cash payments in measuring the economic impact of Government procurement. This fact seems to have been overlooked in the current burst of attention to the "national income and product account" budget.

The Government procurement and expenditure process generates a flow of activity—Presidential program and budget requests, congressional authorization and appropriation, departmental contract letting, private production, and Treasury disbursements. Under varying underlying economic and political conditions, the economic impact of Government procurement may occur during any of the phases of the process, but often prior to the actual governmental disbursements.

The very act of announcing or authorizing a new or increased procurement program can sometimes give rise, by affecting expectations, to changes in business and consumer spending.

More usually, economic activity will be affected soon after contracts 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 normally will have its initial and often major impact on the markets for labor, raw materials, and financial resources.

As noted above, the actual production on Government order will be recorded in the national income accounts as an increase in business inventories.

Only as production is completed and the finished items delivered to the Government will the transaction appear as a Government purchase. The contribution to economic activity will have been made earlier, 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.

However, the mere granting of appropriations and placement of contracts may have little effect on the level of production when resources are already 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.

Data on the various stages of the Government procurement and expenditure process are available in varying degrees. The annual budget document shows appropriations and other forms of new obligational authority on a yearly basis. The absence of monthly or quarterly totals may not be important ordinarily, because the bulk of the funds are appropriated within a period of a few months around the beginning of the fiscal year.

A major gap in our information is the absence of a currently available, regularly issued series on the total contracts let by the Federal Government, and the composition of these contracts.

However, the annual totals of obligations incurred are now reported in the budget document. This is a broader concept which also covers such items as transfer payments and Government employee wages and salaries. The Department of Defense which accounts for the great bulk of Federal procurement issues monthly reports on the obligations it incurs in considerable detail. Especially useful is the breakdown of obligations incurred for procurement of weapon systems, military personnel costs, construction, et cetera. However, these budgetary statistics have certain limitations.

They do not differentiate between in-house efforts and obligations incurred as the result of contract letting, or between procurement of routine supplies and wage and salary payments to Government employees, or between compensation of servicemen and the services supplied to them.

Nevertheless, the monthly reports of the Department of Defense on so-called status of funds are one of the most valuable tools for both general economic analysis and market research and planning in the defense industries. It would be extremely helpful if the other major Federal procurement agencies, such as NASA, were to issue similar monthly reports.

Another major gap in our information is the absence of data on the volume of Government-ordered production, that is business inventories on Government account.

Direct measurement—simply asking each manufacturer to break out Government work in his periodic inventory reports to the Govern-

ment—might be the simplest approach, although there would be a number of problems involved.

Difficulties would be encountered in connection with the various tiers of subcontractors who are not always aware of the nature or destination of the final products into which their output is incorporated.

Some sampling procedures might be required. In the case of prime contractors for nondefense requirements, many of the goods ordered are similar to or identical with civilian goods and sometimes are provided from common production lines.

In the case of military production, the variety of contract types and accounting methods would present some difficulties.

For example, a majority of defense contractors record all costs incurred under cost-plus-fixed-fee contracts as sales to the Government as the costs are incurred, rather than when the completed items are delivered.

Hence, the work performed under these cost-plus-fixed-fee contracts which account for about two-fifths of military procurement, is not reported as inventories, but as either receivables from the Government or, to the extent that progress payments are made, as cash received.

It would be necessary to make the proper adjustment for this method of handling what, at least to the economist, are cost-plus-fixed-fee inventories.

A further complication to adjust for is that these costs include some items which do not properly belong in inventories, but which represent either services or the acquisition of equipment.

Work performed under research contracts often does not directly involve the production of any physical goods. Also, costs for the acquisition of production tooling are more in the nature of producers durable equipment.

The case of fixed price contracts (the other three-fifths of military procurement) presents less difficulties. The major requirement would be to make sure that all contractors report inventories prior to deducting progress payments received.

Another problem associated with the inventories of Government suppliers results from the large amounts of Government-furnished equipment which are physically in the factories of the contractors but are not included, directly or indirectly, in the inventory reports.

This is material such as aircraft engines which has been purchased by the Government from one contractor and furnished to another, generally for incorporation in an end item being fabricated.

In practice, the engine manufacturer would ship the material directly to the airframe contractor for both commercial and military aircraft. Only in the case of commercial products, however, would these engines be included in business inventories.

Government-furnished equipment generally has been excluded from both contractor and Government inventory reports. An initial survey by the Air Force reported that 69 of its largest contractors alone held $1.5 billion of such material on June 30, 1961. I believe, I am not certain, that that is the little addition to the 1961 bar on Mr. Hitch's last chart.

The significance of this underreporting may be realized when we note that the manufacturers of transportation equipment (excluding

motor vehicles)—the industry grouping which both holds the largest portion of military contracts and devotes the large majority of its efforts to military production—reported a total of $3.7 billion in inventories at the same time; that is, roughly 3.7 reported versus 1.5 unreported.

It is my belief that data on the new obligations incurred by the Government are a very useful measure of Government impact on the economy. In the toolkit of currently and potentially available measures of the Government procurement and expenditure process, obligations incurred are a leading indicator.

These data already are prepared as a part of the budgetary control process. In the case of the Department of Defense, data on obligations are published monthly, showing considerable detail as to their composition.

However, their use is not a mechanical one. Some of the shortcomings of obligations data have been pointed out earler. Another problem is the strong and relatively unique seasonal pattern letting.

The dotted line in figure 1 shows quarterly obligations of the Defense Department over the past decade for the acquisition of weapon systems.

The solid line is the actual disbursements or expenditures.

We can see that generally there is a sharp peak in obligations at the end of each fiscal year, the June peaks. This is the phenomena my former colleague in the Budget Bureau would call June buying—it is not limited to military agencies and that there are some exceptions, as in an economy drive, can be seen. This is a strong, atypical seasonal pattern and a good seasonal adjustment would be needed in the use of obligations incurred as an economic indicator.

Another point to consider is that the change between two periods in the statistical total of obligations incurred may not be as important as the composition of the obligations. Some of these considerations may be handled in the preparation of the data. Other factors must be qualitatively interpreted by the analyst.

Along the former lines, we need to distinguish between contracts let with the private sector and other obligations incurred, between durables, nondurables, and construction, and among the major industrial groupings involved (aircraft, electronics, shipbuilding, and so forth.)

Some of this is done already.

However, we cannot expect to burden any reporting system with too much of the analytical requirements. The analyst himself, in the light of his other knowledge concerning economic and industrial conditions, should make distinctions such as the following: Are the contracts being let in the nature of follow-on orders which maintain an existing production program at current production rates; for example, an additional wing of Minuteman missiles to be built after the current wing? In such a case, the lag between obligations and production may be comparatively short, but there may be no net increase in economic activity from period to period.

On the other hand, will the contracts being let finance a new production program? In such a case, the lag between obligation and quantity production may be greater, but with a resultant increase in the level of economic activity.

Also, is the new production program to be located at an existing center for military work or will it be undertaken in an area which will

require a new complex of supporting industries and consumer services?

A current example of such a deep economic and geographic impact is the space program installations along the gulf coast from Florida to Texas. Cape Canaveral and its environs may be merely the most publicized example of a major geographic shift in military-space production, with important effects on regional development to be felt over a long period of time.

Much preparatory analytical as well as statistical work needs to be done along these lines.

I should like to present some rudimentary attempts at analyzing available data on Government production and inventories.

Table 1 will show the composition of Government purchases from private industry for the last year for which we have full data. It is apparent that the great majority—adding the first two lines, military equipment and other military goods and services—four-fifths of the Federal Government purchases from private industry are military weapons and supporting equipment.

This is a far different demand than that of the private economy. With the current emphasis in military procurement on aircraft, missiles, and space vehicles, the industry group most heavily involved is transportation equipment, excluding automobiles, and especially the aircraft or aerospace industry, which is the bulk of that category.

Figure 2 will show the fluctuations in recent years in reported inventories, and I emphasize the word "reported." Available data on inventories of Government contractors as contained in the inventory reports, at least in my opinion, may be quite inadequate, with a good deal of underreporting, statistical underreporting, because of the nature of the accounting systems. We can see the fluctuations in the inventories of total durable goods producers on the top line compared with transportation equipment on the bottom line.

I have used a ratio or semilogarithmic scale to emphasize the proportional changes in the two series. The greater amplitude in the fluctuations in transportation equipment inventories is quite noticeable. What may be surprising is that the two series generally seem to evidence a similar cyclical pattern, although there are some exceptions.

To some extent, this may be the result of the problems involved in the inventory statistics of Government contractors which I mentioned earlier.

Figure 1, to which I referred earlier, shows the raw quarterly obligations and expenditures data. I believe we can see how difficult it would be to use this type of information directly for purposes of economic analysis.

The quarterly data fluctuate in a wide and erratic pattern with no fixed lead-lag relationships to expenditures.

However, I have used annual appropriations and obligations data in analyzing Government spending during wartime with some interesting results. I have some highlights of the Korean mobilization program:

(1) Using the various measures of the different stages of the Government's spending process, appropriations, obligations, and expenditures, we can see that the major expansion in economic activity occurred at about the same time as the announcement and authorization of the program and while many of the orders were being placed.

(2) The expansion in economic activity slowed down at about the same time that the rise in appropriations slowed down.

(3) The declines in appropriations and obligations occurred prior to the declines in economic activity and Government spending.

(4) The major rise in Government expenditures occurred after the major expansion in appropriations and after substantial defense ordering had taken place.

(5) The major expansion in economic activity occurred prior to the major rise in Government expenditures.

In conclusion, the Government procurement and expenditure process is a relatively neglected area of economics. I hope that these very tentative, exploratory remarks will be of some help in indicating potential areas for further research as well as in interpreting the available data.

Thank you.

(The table and charts referred to follow:)

TABLE 1.—*Federal Government purchases of goods and services from private industry, calendar year 1960*

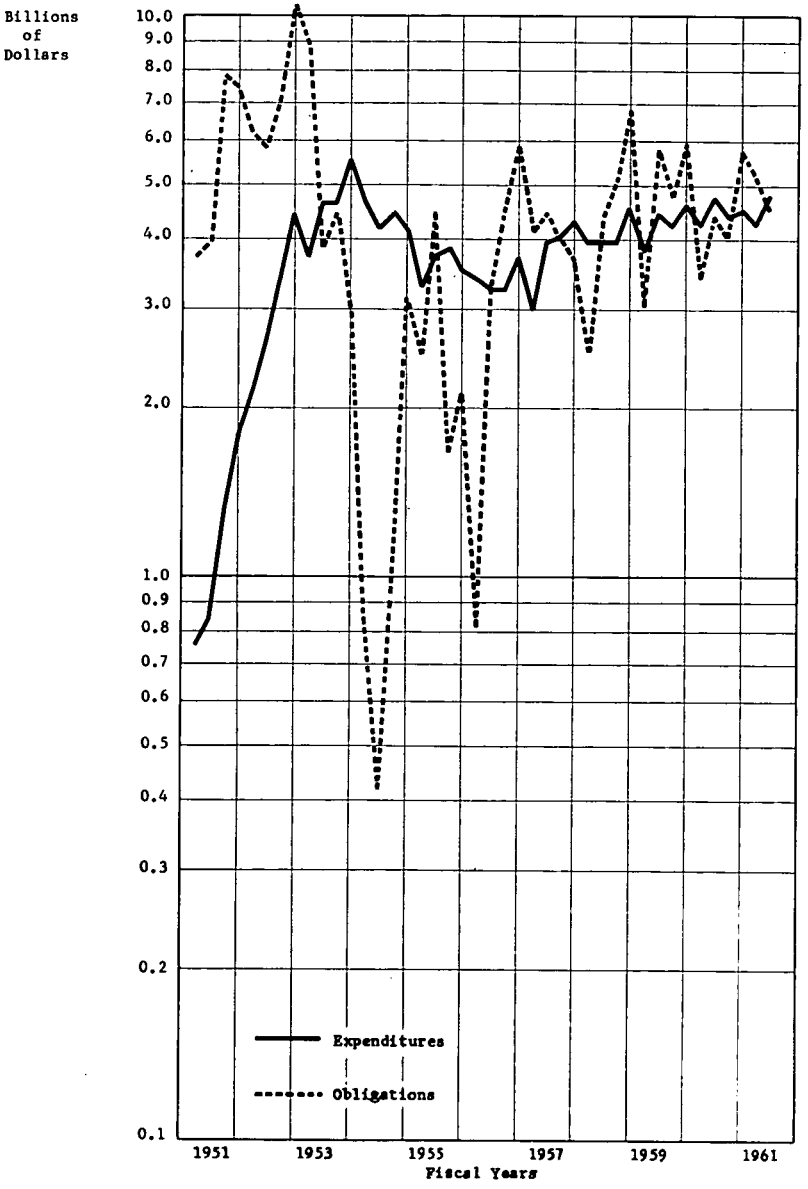
[Dollars in billions]

	Amount	Percent of total		Amount	Percent of total
Military:			Nonmilitary:		
Military equipment	$16.0	50	Construction	$2.3	7
Other military goods and services	9.5	30	Other goods and services	2.7	9
Construction	1.4	4	Total, nonmilitary	5.0	(16)
Total, military	26.9	(84)	Grand total	31.9	100

Source: Survey of Current Business, July 1961.

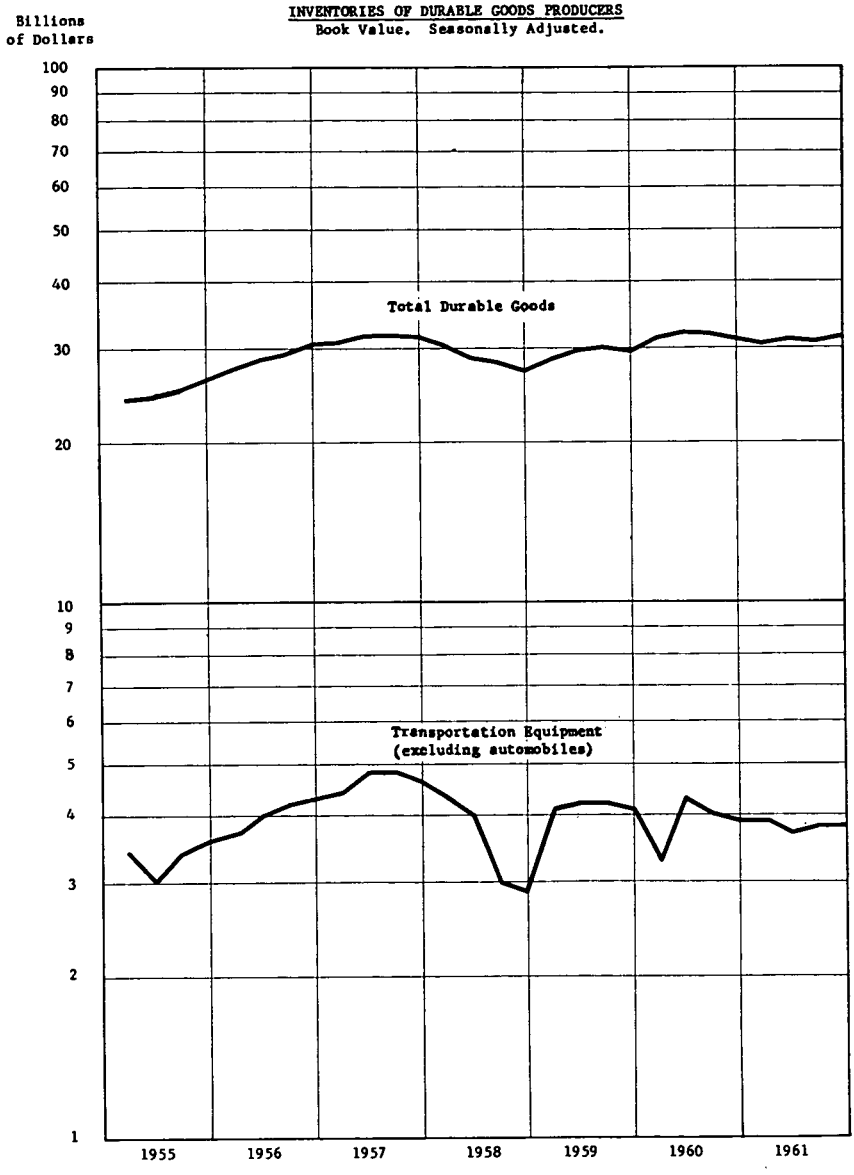
FIGURE 1

OBLIGATIONS AND EXPENDITURES OF THE DEPARTMENT OF DEFENSE, BY QUARTERS
For Procurement and Research, Development, Test and Evaluation



SOURCE: Economic Advisor, Office of the Assistant Secretary of Defense (Comptroller).

FIGURE 2



SOURCE: Survey of Current Business, various issues.

Representative REUSS. Thank you, Mr. Weidenbaum.

Taking you up on your concluding thought, what additional data do we need to measure the impact of Government procurement on general economic activity?

Mr. WEIDENBAUM. Data on obligations or preferably contracts being let, and data on the inventories of Government suppliers.

The reason I say this, this is based on my earlier remarks indicating that the impact of Government procurement on American industry, and on the American economy, by and large, is at the earlier stages during the periods when the contracts are let and production is underway.

If we look at the data on Government expenditures and Government purchases from an economic point of view, I think they are lagging indicators. The economic impact precedes that, and what we haven't developed are these leading indicators.

Representative REUSS. Thank you.

Dr. Darling, do you have any questions?

Mr. DARLING. Would you agree, Mr. Weidenbaum, that this additional information that you say is needed to measure this impact, has a great importance for the forecasting of the course of the economy in the next coming period of, let's say, a quarter of a year; that is to say, the work of the Council of Economic Advisers which is going to determine the status of the economy at a particular moment of time and which way it might be going in order to make recommendations, would be improved if we had this data?

Mr. WEIDENBAUM. I believe so.

I believe one of the questions which has been asked me since I arrived in town, is the quarter-to-quarter outlook for military procurement, for the production of the defense industries, for the remainder of 1962 into 1963, as a major factor in the future outlook. Are we going to have a turning point, are we going to have a recession?

There, of course, the fluctuations in military demand have often been a major portion of our business cycles in the postwar period.

Mr. DARLING. At the present moment as we look ahead to this period, the lack of this data, in other words, makes it very difficult to determine the course of the economy in the next 3 to 6 months.

Mr. WEIDENBAUM. It is a factor. I certainly would not want to overemphasize it, we need to see it in context. But I think if we had this kind of information, we could with a degree of greater confidence, analyze the current economic outlook, and the economic policy required therefor.

Mr. DARLING. Mr. Chairman, may I suggest the desirability, if Mr. Weidenbaum can do so, of having him attend the session on statistics this afternoon, if it meets with your approval, perhaps as an observer who might be called if we found some of this information of importance in the statistics hearing this afternoon?

Representative REUSS. If that fits in with your schedule you would be most welcome.

Mr. WEIDENBAUM. I would be pleased to be here.

Representative REUSS. That is fine, and if there are no further questions we thank you then, for your very substantial contribution, and we will stand adjourned until 2 o'clock this afternoon in this room where we will hear a number of witnesses on availability and reliability of inventory statistics.

The subcommittee is now in adjournment.

(Whereupon, at 11:40 a.m., the subcommittee stood in recess, to reconvene at 2 p.m., the same day.)

AFTERNOON SESSION

Representative REUSS. Good afternoon. The session of the Subcommittee on Economic Stabilization, Automation, and Energy Resources of the Joint Economic Committee will be in order.

We are very happy this afternoon to welcome four very distinguished professional witnesses on the general subject matter of the availability and reliability of inventory statistics. They are Professor Bratt of Lehigh, Mr. Fromm of Harvard, Mr. George Jaszi of the Department of Commerce, and Mr. Modlin of the Bureau of the Budget.

We have statements here from Mr. Modlin and Mr. Fromm. Mr. Jaszi will make a brief statement, and without objection the written statements of Mr. Modlin and Mr. Fromm will be admitted into the record.

I note the presence here of Mr. Weidenbaum of the Boeing Co., whom we invited to sit in this afternoon. Mr. Weidenbaum testified this morning.

I would appreciate it if each of you gentlemen, either reading his statement or summarizing it, would give us the benefit of his thoughts on this subject.

Would you start off, Mr. Modlin.

STATEMENT OF CAREY P. MODLIN, JR., OFFICE OF STATISTICAL STANDARDS, BUREAU OF THE BUDGET

Mr. MODLIN. Yes.

If I may, I think it would be better to summarize rather than read the statement, even though it is a brief statement.

The statement is a status report on recommendations made by the Consultant Committee to the Federal Reserve Board in 1955, and those that Dr. Bratt made last year in response to a request by the Joint Economic Committee for a status report at that time on the 1955 report of the Consultant Committee. Thus, in a sense, this is another updating and another look at some of the problems of supplying the inventory statistics that are generally needed for the many purposes that we all, I think, appreciate.

In summarizing the major points that were discussed in the two groups of recommendations, first, it might be said one group of them pertain to supplementary information and other improvements needed in the inventory statistics to increase their usefulness rather than to increase the number of statistics or the types of statistics available.

Dr. Bratt's report was a distinct contribution in this particular field as well as in other areas. It did collect in a very convenient form bodies of statistics from many different sources. It went into the subject of errors of response, and other types of errors than the sampling errors that are in any statistics based on samples. He also gives us additional insight into the uses of statistics.

In addition to the work that Dr. Bratt did, there have been since 1955 other improvements that one could note. For example, the

Internal Revenue Service has increased the information on inventory valuation methods used in the tax returns that are filed with the Service.

The instructions on the forms used in monthly industry survey program, which is probably the important survey for current inventory statistics on manufactures, have been reviewed and revised considerably to improve the basic data collection irrespective of other revisions in the series.

A pending improvement that is going to be increasingly important in the future deserves mention. It is a rather large subject, as one can appreciate from the description of it. It is an attempt by the Bureau of the Census, in cooperation with the Internal Revenue Service, to find out something more about the relationship between inventory statistics based upon different reporting units, those based on, let us say, the company as a reporting unit as distinct from the Federal Income Tax Unit as a reporting unit or the establishment as a reporting unit, we are just now beginning to have real hope for trying to link those data in ways that we have never been able to link them before. As I indicated, this is a relatively new development, and one that we have a great deal more hope for than we have had benefit from thus far.

On another subject that is probably at the heart of the whole problem of inventory statistics, both the Consultant Committee and Dr. Bratt considered the problem of review and coordination from an overall point of view to the end of providing an integrated body of statistics on inventories. This is discussed briefly in the statement that is being submitted for the record. The problems there are much the same as they were when Dr. Bratt submitted his report. The challenge is still there. I cannot say that the problems are very different nor that the challenges are very different from what they were a year ago. We are hoping more to improve the existing basic programs in which the data will be collected than to undertake a completely new framework in which to try to produce additional statistics.

This, I think, is a subject that might be discussed further during the panel discussion or the committee discussion later.

The improvements in inventory statistics that have occurred since 1955 and since last year probably are highlighted by the improvement that is to come relatively soon now in the monthly industry survey, which is the important manufacturing series. The survey is in the process of being revised completely. The benchmark is being changed, the sample frame is being changed, the instructions for the report have been modified as a result of reviews that were conducted during the past 2 or 3 years.

The whole context of the program and the basic nature of the data that will be produced will change as the series is shifted from orientation around a company to something less than a company. It is called divisions for convenience. What this means essentially is a shift from the broad company basis to something approaching a product. All that one can say at the moment is that it is in that direction. It is also in the direction of the market groupings that the consultant committee and Professor Bratt placed so very much emphasis on.

We hope that the data on the new basis will start being published early in 1963. There is still a considerable amount of work to be

done in reviewing the data that are being tabulated now, both on the old and the new bases.

I might add that while this does not show in the data that are published, the work that has been going on has an effect on the existing series in the sense that the data that are being published now are based on a substantially better base of reports than existed before. For example, the response is double what it was in earlier periods, and this cannot help but improve the basic data.

A different kind of improvement has occured in the areas of wholesale trade and retail trade, particularly in retail trade. As the consultant committee and Dr. Bratt noted, these are areas, particularly retail trade, where the inventory statistics just are not very good. They are not very good because the inventory records on which they would have to be based are not very good. There is going on now and, fortunately, coming relatively close to completion, a basic reorientation of the retail trade sales statistics program. This is not inventory statistics, I appreciate, but the program that will produce improved retail inventory statistics is being modified substantially. The modifications were planned so that they would provide a sound framework on which to build future improvements.

In addition to the reorientation of that program, there will be soon at the Bureau of the Census a program that will attempt for the first time to produce data on the physical volume of inventories held at retail trade. This is limited at the start to major consumer durable goods. The objectives of the survey and the tests that will be made are two: One is a physical volume index, the other is a value index for the larger consumer durable goods. This is the beginning, we hope, of improvements that would have far-reaching implications for many of the problems that exist in the inventory field. I have in mind particularly the broad sector of physical inventory about which information is deficient at the moment.

To illustrate another kind of improvement, the Federal Government generally does what it can to get information from existing administrative data sources before asking firms to submit additional information. We have two jobs at the Bureau in this area of statistics: One is to plan and program the basic improvements in Federal statistics. The other is a reports control function, doing what we can to avoid imposing an unnecessary burden on the business community and others who have to supply the necessary data on which the estimates can be based. This is a long way of getting around to saying that we have used the Internal Revenue Service tax returns to improve in many ways the basic data that we have.

The consultant committee in 1955 had three recommendations for additional tabulations of Internal Revenue Service data. Two of those recommendations were adopted almost immediately, and are continuing. The third one was adopted immediately, was in for 2 years, and then, for a number of reasons, was dropped. It is being reinstituted in the tabulations that are now being planned by the Internal Revenue Service. It is a happy circumstance to be able to say that these three recommendations will be implemented completely.

Another recommendation made by the committee and Dr. Bratt was the recommended reconciliation of the gross national product inventory change data and the value data produced by the Office of

Business Economics. This, oddly enough, is related to one of the projects I mentioned earlier, the census project to relate inventory data, and other data, reported on different bases, for example, the establishment, company, tax unit, legal entity, or whatever else it might be.

The reason for the relationship between these two projects is that one of the problems that has thus far made it very difficult, at best, to produce the reconciliation that was recommended, was that we did not know enough about the relationship between the data reported on the different bases. The census study on inventory statistics, being made cooperatively with the Office of Business Economics, will provide the best link that we will be able to get for some time.

Another important area is that of physical volume inventory statistics and related data, meaning specifically the price data needed to devalue data to get an estimate of inventory volume by the price deflation method rather than by direct count.

This is not an easy one. Some of the progress that has been made here has been fortuitous, for example, in the textile industry and in the steel industry. There has been, as we all know, a considerable amount of interest in those industries. That interest led, for textiles, to the introduction of a new statistical series, including statistics that traced textile inventories at various levels, various stages of fabrication and various levels of distribution. There have been similar but not quite as extensive improvements in the area of steel. Hopefully, we may have others of that sort, but I would avoid being greatly optimistic because of the extreme cost of going into the detail that is necessary to produce these kinds of data.

I mentioned before work that the Census Bureau will do on the physical volume index for consumer durables in retail trade. That should provide a considerable amount of interesting information and experience for the overall problem of developing aggregate physical volume measures, and particularly physical volume indexes and values indexes of inventory.

There is a related—not yet quite directly related—study that should provide some information to help with the value deflation. This is the study made for the Bureau of the Budget by a committee of the National Bureau of Economic Research on Government Price Statistics. We would hope that from that study and from the studies that will result at the Bureau of Labor Statistics and elsewhere, we will get information useful in telling us something about how we might go about deflating inventory value figures to come up with the physical value indexes.

This morning there was a discussion of defense-related and Federal Government inventories. I think that this is a subject that will almost certainly come up in the discussion. All that needs be said now is that there are some fairly serious reporting problems involved which have deterred or deferred improvements in this area. We can go into greater detail on this when the subject comes up.

A more or less spectacular improvement, the last one that I think need be mentioned here, is in the area of inventory anticipations. This subject is a new one, at least in the sense that the original report of the consultant committee did not go into it. Dr. Bratt did and others have, of course.

The series of the Office of Business Economics on which publications started last August, continues to suggest that it is a very good series, telling us for 6 months in advance, and 3 months in advance what the probable level of aggregate inventories will be for manufacturing, and within manufacturing for durable and nondurable goods. To date, the projections or the anticipated figures that have been published look quite good.

I have the feeling, as I did when I read my formal statement after it was duplicated, that I have made things seem a little bit rosier than they are, in fact. I do not mean at all to suggest there is nothing else for anyone to do, and I am sure the discussion that follows will bring that out quite clearly and quite emphatically. The major point I would want to emphasize is the multitude of problems that one has in dealing with a statistic in a body of economic statistics that must be interrelated to be most meaningful, and this point, too, I suspect will come up.

Let me illustrate that: one does not talk about inventories alone very often. One talkes about sales-inventory ratios or the effects of orders on inventories. These sorts of relationships are considered almost automatically now in discussions of inventory statistics problems and of the relationship of inventories to almost anything else, including economic stabilization.

This has an effect on plans and programs for improving the inventory statistics primarily because it has to be considered in the basic data collection, we must also give consideration to balancing improvements in this area with those in other areas, as well, of course, as the cost of specific improvements.

I think that will be adequate for the opening statement. Comments and questions will undoubtedly probe further.

(The prepared statement of Mr. Modlin follows:)

STATEMENT OF CAREY P. MODLIN, JR., RE STATUS REPORT ON RECOMMENDED IMPROVEMENTS IN BUSINESS INVENTORY STATISTICS

Mr. Chairman and members of the committee, when the Joint Economic Committee began its study of inventory fluctuations and economic stabilization in the late spring of 1961, it asked the Office of Statistical Standards of the Bureau of the Budget to provide an up-to-date summary of the status of inventory statistics, with particular reference to the recommendations (32 in number) made in 1955 by the Consultant Committee on Inventory Statistics of the Board of Governors of the Federal Reserve System. The Bureau was fortunate to obtain the services of Prof. Elmer C. Bratt, of Lehigh University, during the summer of 1961 to prepare the report. The Joint Economic Committee published Dr. Bratt's report: "Availability and Reliability of Inventory Data Needed to Study Economic Change," as one of a series of papers under the general subject of inventory fluctuations and economic stabilization. In addition to the status report function that it served, Dr. Bratt's study is a valuable commentary on the significance of inventory movements in explaining economic change and provides users with further insight into the strengths and weaknesses of inventory statistics. Dr. Bratt also added 10 recommended improvements to the Consultant Committee's 32.

The present report has a quite modest purpose. It is a status report on the recommendations of the Consultant Committee and Dr. Bratt for improvements in our inventory statistics. Preparation of the report was made easier by the fact that the improvements that have been made since 1955 or that will be made in the near future are impressive. This progress is especially significant when the problems associated with initiating new inventory statistics programs or expanding old ones are considered. For example, comprehensive current inventory records, on which some of the new statistics have to rest, are not as prevalent in the business world as might be assumed. Even where they are, the reporting burden on

respondents that is inherent in their collection is a real one. Developing procedures for collecting these data without imposing inordinate burden requires rare skills. Moreover, inventory statistics are usually collected as part of much broader data collection programs and are limited to some extent by the larger programs. Finally, needed improvements in inventory statistics must take their place in line with a host of needed improvements in other economic statistics and other claims on the Federal Budget. Stated another way, the basic general economic problem, viz, how to allocate scarce resources among virtually unlimited demands on them, holds sway here, too, as does the need, in specific situations, to compare anticipated "revenue" (viz, expected benefits to potential users) with anticipated "cost" (viz, burden on respondents and costs to the statistics-producing agency) in assigning priorities.

Comments on each of the 42 recommended improvements in our inventory statistics would make this report too detailed to serve as a convenient focus of the subcommittee's consideration of the availability and reliability of inventory statistics. Consequently, my comments have been grouped according to the major subjects covered by the recommended improvements. Any elaboration that the subcommittee or other panel members may desire will be provided during the ensuing discussion of our inventory statistics.

(*a*) *Supplementary information and other improvements needed to increase the usefulness of existing inventory statistics.*—A number of the Consultant Committee's recommendations, and some of Dr. Bratt's as well, relate to the need for better instructions on the forms used to collect inventory statistics, more information on inventory accounting practices, speedier publication of inventory statistics, more complete descriptions of inventory statistics and statements of their limitations, reconciliation of different groups of inventory statistics, closer integration of private and Federal work on inventory statistics and related subjects. It is not a serious oversimplification to characterize these recommendations as being directed toward increasing the usefulness of inventory statistics rather than proposing new series. The increased usefulness of the statistics would result from having greater knowledge of their nature and of the nature of the accounting records or estimating techniques from which they flow and from having the statistics earlier. These are fields in which progress is apt to be achieved slowly, not spectacularly.

It is to the Joint Economic Committee's credit and to Dr. Bratt's credit that his report made a substantial contribution to our knowledge of the nature of our inventory statistics and the subject of errors other than sampling errors. Other gains might also be noted: the review of an improvement in the instructions used in the monthly industry survey program, tabulation and publication by the Internal Revenue Service of inventory valuation methods data reported on Federal income tax returns, exploratory studies by the Bureau of the Census of inventory accounting methods among manufacturing, wholesale trade and retail trade firms,[1] studies of the relationship between estimates based upon different reporting units (e.g., "companies," "Federal income tax units" and "establishments"), and indirect relief of the need for speedier data as the result of publication of anticipated inventory statistics.

(*b*) *Review and coordination from an overall point of view to the end of providing an integrated and rational body of information on inventories.*—For several years now the national accounting framework and the data needed to improve the national accounts have been the primary determinant of priorities for proposed improvements in the Federal statistical system. Recently, other determinants (e.g., the need for more and better local area data) have assumed increased importance. Programs that produce our major inventory statistics series have been significant beneficiaries using either determinant. As the improvements made in our inventory statistics since 1955 attest, these statistics have not been neglected relative to other economic statistics. It is true, nevertheless, that the integrated and rational body of information on inventories to which both the Consultant Committee and Dr. Bratt assigned high priority does not now exist, partially because of our lack of technical ability to produce these statistics except at a prohibitive cost and partially because of the urgency of other important statistical needs. The challenge posed for the Federal Government is to find ways to overcome these obstacles. Some of our efforts to do so to date are noted throughout these comments.

[1] An important finding of these studies is that, frequently, different inventory accounting methods are used for different commodities by the same firm. This is particularly true of large vertically integrated firms; it probably accounts for the fact that many corporations find a simple question as to the inventory valuation method they use a very complex one to answer.

(c) *Proposed revisions in the monthly inventory survey program.*—Both the Consultant Committee and Dr. Bratt urged several modifications in the monthly industry survey program. Substantially complete implementation of these recommendations will be achieved when a revised monthly industry survey report is issued early in 1963. A modified annual survey of manufactures benchmark will be substituted for the Internal Revenue Service Statistics of Income benchmark, the sample design will be revised accordingly, a "divisional" basis of reporting will be used, greater industry detail will be published, and the general quality of the statistics will be improved as the result of a higher response rate in the survey.

(d) *Need for inventory statistics by market groupings.*—The Consultant Committee recommended that inventory statistics be developed—for both manufacturing and the distribution trades—for the following market groupings: Finished manufactured goods, subdivided into producers' equipment, consumers' durable goods, and consumers' nondurable goods; for unfinished manufactured goods, subdivided into construction materials and unfinished goods destined for further manufacture; and such further product differentiation between categories as may prove feasible. It is doubtful that the implementation of any other recommendation would improve our knowledge of inventory fluctuations as much. As Dr. Bratt noted, the problem turns on practical methods of obtaining these statistics. The shifts to the annual survey of manufactures benchmark and to divisional reporting for the large multi-industry firms in the monthly industry survey are significant advances in the direction of market groupings, and improvements in the quality of our basic wholesale trade statistics also help. Substantial needs still have to be met, however, and, as Dr. Bratt observed, the difficulties of doing so are great. The use of analytical techniques rather than more detailed basic data collection may be the most feasible way to produce these data. Both approaches will be tried in efforts to provide these needed data.

(e) *Wholesale trade and retail trade inventories.*—In both of these areas, but especially in wholesale trade, our current inventory estimates have been improved since 1955. Much remains to be accomplished. Basic improvements in the monthly retail trade report sales program of the Bureau of the Census were designed so that this program would be a sound foundation on which to build. These improvements, which include a new weekly retail sales series, retail sales data for geographic regions and local areas and retail sales by broad merchandise line categories, are being achieved. When they have become part of our retail sales statistics, extensive efforts to improve retail inventory data will be possible. Meanwhile, some very important experimental work on retail inventory data collection will proceed, notably, in the form of a test of the "random count" approach referred to by Dr. Bratt. Consideration of programs affecting the department store sector should be deferred until a study of Federal Reserve System department store statistics programs has been completed by a committee established by the Federal Reserve.

(f) *Proposed additional tabulations of Internal Revenue Service inventory statistics.*—The Consultant Committee recommended that beginning-of-year and end-of-year data be tabulated, separately for corporations and for the unincorporated sectors, for firms reporting both on their income tax returns and that tabulations be prepared for manufacturing corporations showing the fiscal periods to which the data relate. Dr. Bratt noted that while the first two tabulations are being made annually, the third tabulation was discontinued after 2 years. He suggested that it be resumed, and it will be.

(g) *Reconciliation of gross national product inventory change data and Office of Business Economics value data for manufacturing and trade.*—Both the Consultant Committee and Dr. Bratt emphasized the importance of this reconciliation and of publication of the significant intermediate results of the calculations culminating in the published GNP series on change in business inventories. Studies that are a prerequisite to implementation of this recommendation are being conducted now by the Bureau of the Census and the Office of Business Economics. One of the major objectives of the study is to learn more about the relationship of inventory data reported to the Internal Revenue Service on a "tax unit" basis and those reported to the Bureau of the Census on a "division" basis, since a substantial part of the difficulty of implementing the recommendation is associated with having to relate data based on these different reporting units.

(h) *Physical volume inventory statistics and related data.*—A number of the recommended improvements in inventory statistics concern estimates of the physical volume of inventories. These recommendations include suggestions that study and experimentation be undertaken on ways to produce physical

volume measures of inventories at aggregate levels and in selected detail, that additional information needed for deflating inventory values be obtained, that experiments be undertaken in constructing physical volume indexes for significant broad sectors or types of products, and that studies be made of the feasibility of developing satisfactory physical volume inventory and related data for individual commodities of outstanding importance and for significant sequences of commodities at several stages of fabrication and distribution. Both the Consultant Committee and Dr. Bratt recognized that the technical and other difficulties in this area are many and complex. In general, the potential reporting burden and other costs implicit in large-scale programs to provide physical volume data discourage high hopes for major breakthroughs. Recent progress is encouraging, however. The work soon to be undertaken by the Bureau of the Census toward developing both physical and value indexes of retail inventories of major consumer durable goods will be of great interest and aid. The intense interest in the textiles and steel industries during recent years made it possible to obtain additional physical volume inventory data (and other data) on them. The recent intensive review of Federal price statistics programs, and the studies that it has prompted and will prompt in the near future, should be sources of much valuable information on problems associated with deflating inventory value figures.

(*i*) *Relationship of orders and inventories.*—Dr. Bratt noted that the use of orders data could be made more effective in the study of inventories if the meaning of orders data were more clearly understood and suggested that studies be made to provide this better understanding. The importance of orders data in analyzing inventory fluctuations and economic conditions is obvious from even a cursory reading of the papers prepared for the subcommittee on these subjects. While the staff and resources of the Monthly Industry Survey are committed to other important projects (e.g., revision of the Monthly Industry Survey, and initiating a program to obtain data on orders for export) until at least early 1963, efforts to obtain more comprehensive data on the nature of orders should have high priority thereafter. The feasibility of obtaining, through the monthly retail trade report program, meaningful data on orders placed by retail trade also needs study.

(*j*) *Defense-related and Federal Government inventories.*—Recommendations on these subjects included one that the current report of manufacturing inventories be classified according to whether the inventories are related to defense or nondefense work and one that net changes in selected categories of Federal Government inventories be shown in the GNP tables. While current data on sales to and orders from the Federal Government have been an important segment of the defense-related industries (viz, manufacturers of aircraft, aircraft engines, space vehicles, missiles, missile engines, and related products and services), reporting problems continue to stand in the way of obtaining data via direct collection from even prime contractors on their defense-related inventories. The reporting problems of subcontractors are more formidable. It may be that estimates of these inventories will have to be developed through analytical techniques rather than direct data collection. Unfortunately, this task would fall on the already burdened shoulders of the Monthly Industry Survey staff. With respect to net changes in Federal inventories, the quarterly information on Federal inventories is still too limited to support meaningful inventory change estimates. The vigorous current interest in the impact of Federal activities on the economy might encourage improvements in the basic data needed for these estimates.

(*k*) *Inventory anticipation statistics.*—The success to date of the Office of Business Economics series on manufacturers' inventory anticipations is one of the major recent improvements in inventory statistics. When additional experience has been gained in producing and analyzing this series, consideration will be given to expanding it or developing similar programs for other sectors. An obvious first direction in which to expand the existing survey is greater industry detail within the manufacturing sector.

This report has been limited to the needs for inventory statistics listed by the the Consultant Committee and Dr. Bratt. The reference to orders data is the only exception. The need for other types of statistics (e.g., sales) on a comparable basis to permit more meaningful analyses of the inventory statistics is obvious. It is mentioned only to make it explicit, as both the Consultant Committee and Dr. Bratt did.

Representative REUSS. Thank you, Mr. Modlin.
Mr. Jaszi?

STATEMENT OF GEORGE JASZI, ASSISTANT DIRECTOR, OFFICE OF BUSINESS ECONOMICS, DEPARTMENT OF COMMERCE

MR. JASZI. Mr. Chairman, I have no written statement, but I shall be glad to talk briefly from notes.

The Office of Business Economics is very much interested in this subject of inventories.

We cooperate with the Bureau of the Census in the processing of the basic surveys on inventories in manufacturing and in trade, and we put out the inventory anticipations survey to which Mr.Modlin has so generously referred. We use these data in estimating the inventory components of the gross national product, so here we are both users and producers of inventory data; and, finally, we do use the data in economic analysis as you can see from the Survey of Current Business and from the testimony which Mr. Paradiso gave here a few days ago.

We recognize the need to get better, improved information on this volatile and strategic item, but we do want to stress that the difficulties are very great in this area for a number of reasons.

In the first place, a very large proportion of inventories are held by small firms, mostly in the retail trade, and the reporting by these firms is notoriously inadequate, so that is one big obstacle. Closely associated with it, inventories are a very tricky item to report upon, so we have a serious data problem here.

The second difficulty is that inventories have a very strong seasonal movement, and even if we had perfect data, just to adjust for seasonal variations would continue to be a serious headache and a problem which cannot be solved perfectly by any means.

The third major difficulty in this area is in the way of getting very good estimates is, this: that inventory change, which is the item that most people are really interested in, is what we call a residual estimate. We get it by differencing the inventory position at two periods of time.

Suppose we estimate that inventories change from one quarter to another from $100 to $105 billion, and suppose we make only a very small error in the basic stock estimates. Suppose we make half a percent of an error in the basic stock estimates, which certainly is not large. Then if we are unlucky, and the error works one way in the one period and the other way in the other period, we will be making a 20-percent error in the estimate of inventory change.

So it is for all these reasons very difficult to get reliable data in this area, and even though all of us should strive for better data, it is certainly not a field where we will ever reach perfection.

I think I can divide my brief remarks on major data gaps and what ought to be done about them, in two parts, two compartments, as it were. I would like, first of all, to make a few comments about the book values. These are the inventory data as they are reported to us by business reflecting varied accounting methods. That is one compartment. The second compartment is one I will call revaluation for the purpose of inclusion in the national product where these book values have to be revalued in terms of a different accounting procedure that we use in the national income and product accounts.

As to book values, it is convenient again to proceed in two steps. I would like to say a few words first about the benchmark data—the

basic data, that we ultimately get about inventories, and secondly about the more current data which we use to keep up the information, to keep it current.

There are two basic sources on which the benchmark estimates of the book values can be based.

First of all, there are the data from the Internal Revenue Service that are published in Statistics of Income. This is a very comprehensive source because it covers the entire economy; all types of inventories by all legal forms of business are covered.

But it has several distinct disadvantages. First, these data are based upon a company classification, and inasmuch as large companies may be involved in more than one industrial activity, they do not give us the best kind of detailed breakdown. Secondly, these Internal Revenue Service data do not refer to a clear-cut time period. The bulk of them refers to the calendar year, but there are a very large number of companies that get included on a fiscal year basis, so whenever one uses this Internal Revenue Service data one does not know exactly what time period one refers to. I think there are the two reasons, the two main reasons, why we should like to get away from the Internal Revenue Service benchmark and to switch to another benchmark.

The other obvious possibility for a benchmark is to use Census Bureau information, which is much less subject to the shortcomings that I have mentioned—not at all subject to the industrial classification difficulty, and much less subject to the fiscal year problem.

But other problems arise. The only true benchmark information that the Census is publishing refers to manufacturing. The retail sales census has stopped publishing information on inventories. It is difficult to get these data in the framework of a census. The inventory information that is contained in the wholesale census had become more abbreviated. And there is no census information for other industries.

So there is a serious question here whether we should depart from the Internal Revenue Service benchmarks and shift over to some kind of census benchmark when the census information at present is not comprehensive. I am not saying that it should not be done. I am raising it as a question for discussion.

As far as the annual and the monthly surveys are concerned by means of which we bring up to date currently the benchmark information, I would like to talk separately about manufacturing and trade and "all other."

As far as manufacturing is concerned, Mr. Modlin has mentioned the basic reworking of the industry survey which the Census Bureau is presently undertaking and is about to complete, and we have high hopes for this survey, and I won't comment about it any more.

As far as wholesale trade is concerned, the Census surveys of inventories will be incomplete because they will not include any information on manufacturing sales branches, on agents and brokers, on assembliers of farm products, and on bulk petroleum stations. In other words, saying the same thing in a different way, they will not include anything except merchant wholesalers.

So a substantial segment of wholesale trade will not be covered by the current census surveys, and we do regard this as a major gap in

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our information and would very much hope that something could be done to fill this gap.

As far as the retail survey is concerned, we would like to have considered whether the survey could be strengthened statistically to provide a more comprehensive coverage of the large group of small retailers.

As far as "all other" inventories are concerned, it is a difficult situation to diagnose. This is not a very large area. It does not account for a large part of inventories, but from time to time it has accounted at annual rates for, perhaps as much as $1 billion in the quarterly change in business inventories, and the question is should we do something to improve the data situation in this area.

At present we are poorly off. The only data that we have quarterly to cover this segment are the quarterly surveys of working capital by the Securities and Exchange Commission. These do not have complete coverage. Moreover, they are produced with a substantial delay, so we are not able to take account of these inventories satisfactorily on a quarterly basis currently during the year.

It is a question of cost. Does one want to put a substantial amount of money into this segment in order to get better data in view of the poor data situation, or does one decide that this is not an item of high priority, and again I simply raise this as a question for discussion.

As far as my second compartment is concerned, the revaluation of inventories, the position here is that business firms report to us on a variety of accounting methods, first in-first out, last in-first out, and other methods.

It is quite a diversity of reporting procedures. When we calculate inventories for inclusion into the gross national product and into the national income accounts, we convert all these book value reports into one uniform accounting procedure that we use in these accounts. This might be characterized as approximating the last in-first out method of inventory accounting in most situations—not in all situations—but it comes nearest to that method, and maybe that is enough for this purpose.

Now, in order to convert the reported book values into our national income method of accounting for inventories, we have to know, first of all, the actual basis on which these inventories are reported to us by business. We have to know what is reported on the FIFO method and what on the LIFO method, and so forth. Actually it is quite complicated because we really need to have it broken down by industries and by types of inventory holdings.

The second thing which we have to know in order to do this job of conversion properly is what price indexes to use in order to convert these book valuations into the current valuations that we use in the national income and product accounts.

We have some information on both of these subjects now, but the information is not sufficient on either score. We do need, first of all, a comprehensive survey of inventory accounting methods which will tell us by industry and by type of inventory what the actual book valuation practices are that are reported to us by business. We know it now in broad outline, but we do not know it in sufficient detail, and if we want to have these estimates improved, we have to have more information on actual practices now used by business. A great deal

of progress has been made along these lines. At the Office of Business Economics we have had two or three surveys of the use of the LIFO inventory method especially in manufacturing. The Internal Revenue Service has made some surveys of inventory accounting methods, and Mr. Modlin has mentioned some of the work which has recently been done by the Bureau of the Census. But when all this progress has been noted, it is still a fact that a comprehensive detailed survey of business accounting methods with respect to inventories would be a very valuable contribution to our knowledge.

As far as the second requirement is concerned, the requirement for improved price information to convert the book values into current values, again we have a great deal of useful information from the price information that is compiled by the Bureau of Labor Statistics. But again, I can see some improvements in this field.

For instance, we do not have indexes that are applicable to goods in process, and to finished products. These goods in process and these finished products are valued in the books of business, as far as we know, by adding to the purchase price of the materials used the wage costs that have been expended in the course of processing, and maybe some other costs also, maybe some overhead. It would be very good to construct special indexes that are applicable to the valuation of goods in process and of final goods inventories. This would be one area of improvement.

The second improvement that would be very good from our standpoint would be if the price indexes that are available to revalue inventories would be more clearly defined in respect to the markets to which they refer. This is a clumsy statement, but I will give an illustration. Suppose we want to revalue inventories of typewriters, and typewriters are held by manufacturers, by wholesalers and by retailers. All we have available now is one index for typewriters, some kind of a wholesale index for typewriters, and we use that to revalue manufacturers' typewriters, wholesalers' typewriter holdings, and retail typewriter holdings, and maybe that is not too bad a procedure, because maybe these three types of prices move in the same direction and, if that is so, that is fine. But maybe they do not move in the same direction, and if they do not move in the same direction, it would be very useful to be able to distinguish these wholesale price indexes so as to know what is applicable to manufacturers, what is applicable to wholesalers, and what is applicable to retailers.

Now, another way in which the price information that we have could be improved would be this way: That at present the wholesale price indexes that are produced give weights to commodities in proportion to total sales; whereas from the standpoint of the inventory deflation, the weight should be in proportion to inventory holdings. Again, I do not know how important this is. It might turn out, upon investigation, that this weighting problem is not awfully important. On the other hand, it might be important, and I think it would be a well-directed expenditure of effort if some attempt were made via some survey of the commodity composition of inventories to get proper weights to combine these various price indexes for the purpose of this revaluation.

I think these are my main comments on major gaps as we feel them, and suggestions for improvement, Mr. Chairman.

Thank you very much for giving me an opportunity to make them.

Representative REUSS. Thank you, Mr. Jaszi.

Now we will hear from Professor Fromm.

STATEMENT OF GARY FROMM, HARVARD UNIVERSITY AND UNITED RESEARCH, INC.

Mr. FROMM. Thank you, Mr. Chairman.

My own expertise in this subject stems almost wholly from being a user of the statistics, and the other gentlemen at the table are much more qualified to speak on the acquisition and exact construction of the data. Thus, my remarks in the statement are colored by the fact that I am mainly interested in inventory statistics from the standpoint of economic analysis and from the viewpoint of using them in formulating stabilization policy.

I think the best thing for me to do would be to read the statement.

The subject to which this session of the hearings on inventory fluctuations and economic stabilization is addressed is the availability and reliability of inventory statistics. It would seem wise, however, before launching into a discussion of how inventory and related data might be improved, broadened, and analyzed, to examine briefly the impact of inventory fluctuations on the economy. There is little sense in currently building a Parkinsonian pyramid, utilizing scarce resources, to acquire information which has limited utility in terms of the solution of the economic difficulties which presently plague the Nation. If, on the other hand, the use of more accurate and complete inventory data can lead to substantially greater economic growth and stability, every effort should be made to acquire, continuously, extensive inventory statistics.

This gets to the point that Mr. Jaszi made that we have limited resources in the Government for collecting statistics, and if we want a piece of data we do have to determine whether its cost is really justified in terms of the value of the information.

It would appear, given the present quality and quantity of inventory data, the nature of the inventory process, the postwar cyclical behavior of the U.S. economy, and the character of the problems with which we are currently confronted, that major endeavors for the improvement of inventory statistics are unjustified. Nevertheless, some amplification and modification (and much more intensive analysis) of the inventory data now being collected is certainly desirable.

Representative REUSS. Professor Fromm, since your whole statement will be made a part of the record, it may be that you would want to simply sketch out the high points of it in your oral presentation.

Mr. FROMM. All right, fine.

When reviewing the postwar experience that we have had in the economy, we find four recessions. Upon scrutiny of the last three recessions it seems that there are a great number of factors which resulted in those downturns, but one of the prime factors, at least in my analysis, appears to be the instability in Government demand and, particularly, the instability of the demand for goods.

Now, in this figure which I have reproduced in my statement as figure 1 we can see that the economy endured marked fluctuations in Government expenditures for goods from 1947 through 1960. Of the

three series shown, durables are probably the most important for several reasons. First, they are about twice the magnitude of the nondurables. More significantly, they have a much greater feedback impact on the rest of the economy in terms of inventory investment and investment in plant and equipment.

Now, if one recalls the cyclical GNP peaks in 1953, 1957, and 1960 and compares them with this series of durable expenditures, one finds that, on the average, durable expenditures by Government leads the peak in GNP by three-quarters.

Then if cognizance is taken of the fact that orders lead expenditures by several quarters more, and that Professor Darling has found that inventory reversals lead the peak in GNP by three-quarters, and being aware of the impact of orders on inventories, then one is led to the conclusion that instability in Government demand for goods has had a considerable influence on inventory fluctuations and, perhaps, has been the principal cause of the last three recessions.

So, in terms of what we want in the way of inventory data in the future, we clearly do not have at the present time any comprehensive picture of the cyclical level and nature of Government demand.

We have some monthly information on Department of Defense obligations for procurement in various series, but they are all very aggregated, and there is no breakdown by product classification or industry group. We also have absolutely no idea, for other Government agencies, what their current obligations are in terms of goods and services by type. Six months after the close of each fiscal year, one can obtain total Federal obligations and expenditures from the Budget. But to derive the breakdown by industry or product type is nearly impossible.

A suggestion I have, therefore, and one I believe we can implement with a minimum of cost, is that we collect data from the contract officers of the various Federal departments, on either a monthly or quarterly basis, on their obligations in the previous period. This would, at least, cut down by almost a year the reporting lag on the total figure on obligations, and it would also yield, if a product breakdown were obtained, a lot more information that we could use in inventory analysis and short-term forecasting.

Mr. Modlin has already mentioned the new survey being conducted by the Bureau of Census. This is something which has been needed for a long time. Unfortunately, we have never had any statistics by some kind of a market grouping, and if we are going to make an analysis of the economy to determine the factors which influence both growth and stability, we must be able to trace through the entire transmission of demand structure from one industry to another.

The way the statistics are reported currently, we have information by roughly two digit industry groups. But this is really not data that can be employed for demand analysis.

Because it is necessary to undertake demand transmission analysis in order to determine the basic underlying economic structure and the factors which influence the behavior of firms, what we really need is some kind of combination cross section time series analysis which encompasses all the variables for an individual reporting unit and relates them to either the past historical data of that reporting unit or the data for other companies. Thus, one of the suggestions that I

would like to make and should like to have the panelist discuss, is whether it would not be feasible in the surveys that the Department of Commerce is now conducting on investment anticipations, inventory anticipations, sales, orders, et cetera, to gather all this data in a single questionnaire, so that we could then prosecute the analysis of the behavior of the firm.

Also in the past, the Bureau of Census has made use of academic research people and has given them access to their files and confidential reports. We have not had the advantage with the Department of Commerce. All the individual company data that the Department of Commerce has had has been kept confidential. I do not know whether this stems as a result, but as far as inventory analysis goes, we have apparently only scratched the surface. What we really need is a lot more intensive work. Certainly, as Mr. Jaszi is well aware, the resources of the Office of Business Economics are quite limited and, perhaps, we might consider appointing commerce agents—reliable, reputable scholars who will not release any information, but yet can make use of it for analysis.

Mr. Bratt, in his paper, has done an extensive job in pinpointing a great number of additional problems that we face with inventory and orders data. I would like to mention an important difficulty which I do not believe has been resolved. That is, the BLS provides us with price information which we can then use to deflate inventories, unfilled orders, new orders, et cetera, but there is some question regarding the time period to which these prices apply.

After all, one can go out in the market and ask, what does a widgit cost, and get a quote. But is this a price for current delivery or is it a price for the widgit to be delivered a year from now? Now, for nondurable goods this is not much of a difficulty because the leadtime in production is so short. But when we get to the durable goods field and are confronted, in some instances, with leadtimes of 18 months or something of that order, then it becomes a problem. Even if we are told currently that, "Yes, this is a price for the item to be delivered 18 months from now," what happens if costs are rising? Are there provisions in contracts for future delivery for renegotiation? This is a matter which I believe bears investigation.

This fairly well covers what I wanted to say on inventory data. Thank you.

(The prepared statement of Mr. Fromm follows:)

INVENTORY FLUCTUATIONS—IMPACT, MEASUREMENT, AND ANALYSIS

(Statement prepared by Gary Fromm of Harvard University and United Research Inc. in connection with hearings on "Inventory Fluctuations and Economic Stabilization," July 12, 1962)

The subject to which this session of the hearings on inventory fluctuations and economic stabilization is addressed is the availability and reliability of inventory statistics. It would seem wise, however, before launching into a discussion of how inventory and related data might be improved, broadened, and analyzed, to examine briefly the impact of inventory fluctuations on the economy. There is little sense in currently building a Parkinsonian pyramid, utilizing scarce resources, to acquire information which has limited utility in terms of the solution of the economic difficulties which presently plague the Nation. If, on the other hand, the use of more accurate and complete inventory data can lead to substantially greater economic growth and stability, every effort should be made to acquire, continuously, extensive inventory statistics. It would appear, given the present

quality and quantity of inventory data, the nature of the inventory process, the postwar cyclical behavior of the U.S. economy, and the character of the problems with which we are currently confronted, that major endeavors for the improvement of inventory statistics are unjustified. Nevertheless, some amplification and modification (and much more intensive analysis) of the inventory data now being collected is certainly desirable.

These conclusions stem from a review of the results of the recent studies conducted for the Joint Economic Committee and those prepared by other analysts. All have noted the impact of inventory disinvestment on the level of gross national product in the recessions following World War II. The last decade has witnessed three of these declines, each of which has been caused by a complex of factors. Of these elements, however, instability in Government demand appears to bear a large, if not the principal, burden of responsibility for the last three downturns.

Figure 1 shows the pattern of government goods expenditures (Federal plus State and local) from 1947 through 1960. Of the series depicted, durables expenditures are the most significant, since their level not only contributes to current demand to twice the extent of the nondurables, but also because of their marked influence on investment in plant and equipment and inventories in the private sector. The relative importance of durable goods has already been cited in these hearings and in the Stanback paper.[1] It can be seen that government durables expenditures declined, or stopped rising, on a continued basis on an average of three quarters prior to each cyclical GNP peak. This fact becomes even more striking when it is realized that orders lead expenditures in timing and that they have been shown by many researchers to have a strong impact on inventory investment.

Thus, subsequent to a negative shock in government goods expenditures, an inventory reaction normally sets in, engendering a rapid fall in national income. Some analysts have, therefore, placed the blame for the last three recessions on the reversal in inventory investment itself. This conclusion may be open to question. The resultant inventory behavior seems rather to be a secondary cause of declines in national product, merely manifesting the drop in income but not itself initiating the cyclical reversal. If so, any stabilization efforts might best be directed at removing the primary sources of instability. This does not mean, however, that endogenous, cumulative inventory adjustments are unimportant, but only that they are unlikely to effect cyclical reversals of the severity experienced in the last decade without the presence of exogenous or endogenous shocks.

Nevertheless, because the gains from diminished inventory disinvestment may be substantial (as was shown by the simulation studies prepared by the committee), interest does center on the potential stability contributions of a reduction in the amplitude of inventory fluctuations. An analysis of theoretical inventory behavior reveals that inventory investment is principally determined by various long-run cost factors, the availability of future supplies, and the expectation of future sales. Nonetheless, firms do not adjust their stock levels continuously to a desired norm—due partially to the costs of control and partially to human inertia.

When great changes in sales expectations take place, however, a rapid alteration in stock levels occurs. In this regard there may be a systematic tendency to overreaction. Therefore, if inventory fluctuations are to be reduced, sales expectations must be stabilized. This can probably best be accomplished via Government actions which contribute to stability and a high rate of economic growth.

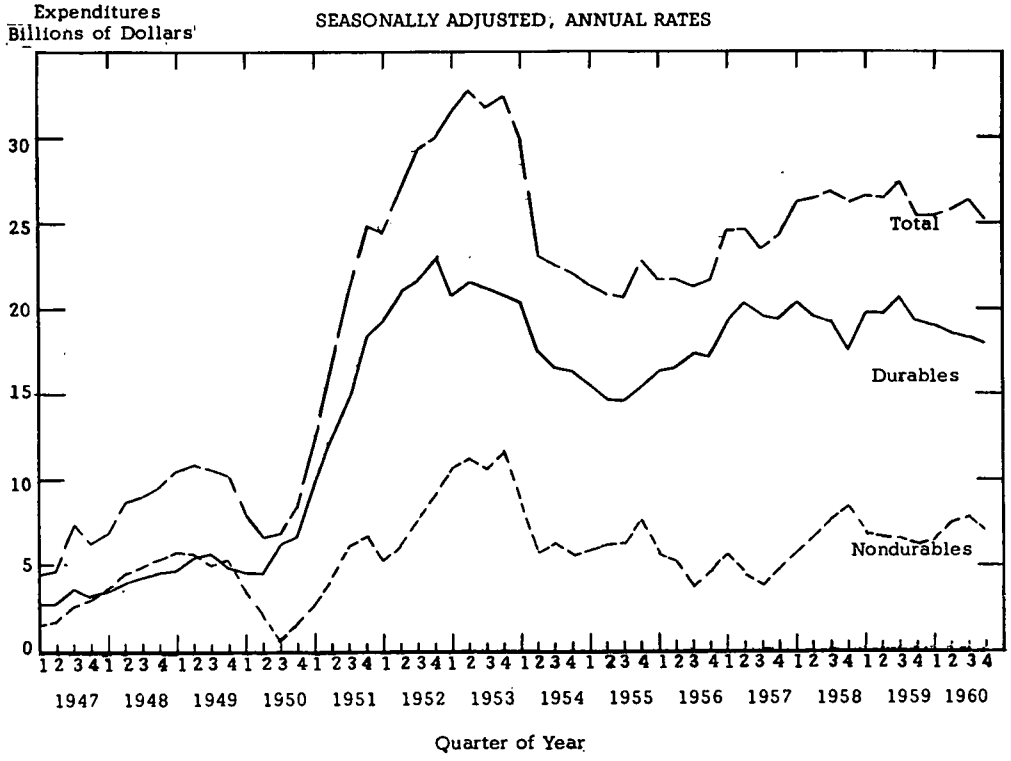
In the realm of influencing the structural relationships in the inventory accumulation process, long-run improvements in methods and costs of inventory control (including the increased application of electronic computers) will bring about a continued decline in inventory-sales ratios and a heightened sensitivity to sales expectations.

Since the Government probably can do little to influence the cyclical costs of maintaining inventories (tax credit schemes might prove expensive in terms of direct outlays and potential misallocations of resources), the primary hope for inventory investment stabilization probably lies in altering the timing and magnitude of Government demand. Normally, both sharp increments and decrements in demand should be avoided if possible. Countercyclical orders and expenditures, too, will have the desired result, but any errors in stability management will also be magnified and would cause undesirable effects.

[1] Thomas M. Stanback, "Postwar Cycles in Manufacturers' Inventories," Inventory Fluctuations and Economic Stabilization, pt. I, Joint Economic Committee, Congress of the United States, Washington, D.C., 1961.

GOVERNMENT GOODS EXPENDITURES — FEDERAL AND STATE AND LOCAL

SEASONALLY ADJUSTED, ANNUAL RATES



Casting the above analysis in the light of the current situation, those who are proposing tax cuts and Government expenditure reductions (thus no increase in the deficit) should be aware that the short-run balanced budget multiplier for a matching decline in taxes and outlays is less than unity and, therefore, the pursuit of such a policy would bring about the recession which the tax measure is intended to avert. This is all the more true if the expenditure cutbacks are for durable goods, thereby causing a strong fixed investment and inventory diminution feedback.

Keeping in mind the characteristics of the relationship between inventory fluctuations and cyclical instability cited above, it is now feasible to consider the inventory data requirements for future analyses and Government policy considerations. One of the most pressing needs for information is in the area of Government demand.

Statistics are currently available on Department of Defense total and procurement obligations and military prime contract awards to U.S. firms. These statistics are not disaggregated into their principal components, however, and therefore are of limited value in analyzing the cyclical behavior of the economy. What is desired is a breakdown of defense demand into two-digit industry groups and by major product classification. New orders or obligations for services (including research and development) should be clearly distinguished from those for hardware. Expenditures and unfilled orders data on the identical basis to that cited for obligations should also be collected.

Although the military purchases of goods and services from the private sector are the dominant force in alterations of Government demand, other agencies also contribute importantly to such movements. Therefore, statistics on new orders, unfilled orders, and expenditures by vendor industry and type of product should also be gathered. Presumably, this information might be obtained relatively inexpensively on a monthly or quarterly basis by an appropriate canvassing of the contract offices in each Federal department.

All this data, of course, only provides a partial indication of demand in the economy. If the orders-production-inventory-sales process is to be explained accurately, more precise information on these variables by firm, industry, and market grouping is necessary. This does not necessarily mean that the present number of companies sampled should be drastically increased. A modification of the current questionnaries and, perhaps, a restructuring of the sample might be in order. In the realm of market grouping, the Bureau of the Census is now in the process of adopting this type of structure for the former Office of Business Economics survey for the monthly determination of manufacturers' sales, inventories, and orders. This is being accomplished by securing divisional reports within large firms and integrating the statistics with the sample survey results of small companies' operations. This effort is to be commended and should be carried to fruition.

The market-grouping classification is vital for several reasons. First of all, it tends to conform more closely to the final product accounts of the national income statistics and, therefore, might lend itself to the further interpretation of these figures and potential input-output studies. Secondly, it is an important step in the process of analyzing the forces which generate both cyclical instability and economic growth. In order to partially accomplish this latter goal, it is probably necessary to be able to trace the transmission of demand from one industrial and commercial sector to another. What this requires is data on a multiplicity of variables in a significant number of firms structured in a sample on a market-group basis. Ideally the information obtained quarterly (some types of data should be requested monthly) from each reporting unit would include the actual results of operations in the preceding period and the anticipated values for sales, inventories (preferably by stage of fabrication), new and unfilled orders (customers' orders for finished products and the firm's orders for purchased materials—if possible order cancellations or postponements might be noted, too), and investment in plant and equipment for several quarters into the future. It would be highly desirable to gather statistics on profits, capacity utilization, and employment at the same time. Some of these data, of course, will be either difficult to obtain or, because the appropriate records are not kept by the firm, completely unavailable. Nevertheless, the attempt should be made to acquire the complete set.

Data alone, obviously, do little to enhance knowledge of the forces which control the economy. Only its analysis will furnish the desired information. Even today, the vast wealth of inventory statistics has barely been analyzed. What is needed is an intensive combination of cross section and time-series studies of individual firm data. Therefore, either the Government agencies

concerned should undertake the requisite investigations, or some means of releasing the data for academic research should be provided. Perhaps the certification as Census or Commerce agents of some few reputable trustworthy scholars interested in inventory problems would fulfill the disclosure provisions that are an absolute necessity for soliciting business cooperation in providing confidential statistics.

Before concluding these already lengthy remarks, a few words might be added on inventory data deflation. More precise information is needed on the prices at which inventories, new orders, and unfilled orders are to be valued and the true transactions prices of sales. The primary source of difficulty, although nondurables also evidence the deficiency to some extent, lies in the area of durable goods. Too little is known about the prices at which orders are taken when leadtimes are long, and the importance of recontract and renegotiation in periods when costs are changing. Thus, for example, present quotes for durables prices may be those for future delivery, while sales are made at past prices. With rising prices and the valuation of shipments at current rates, this would result in a downward bias in deflated sales.

There are many other problems and issues to be resolved in the preparation, publication, and interpretation of inventory statistics.[2] A great deal of future research is needed. Fortunately, however, due to the changing nature of Government defense demands and the more intensive utilization of stringent inventory control techniques by business, recessions probably are becoming less severe. Nevertheless, interest will, and should, still center on inventory fluctuations in the years ahead because of their intimate relation with the achievement of a high, stable, inflation-free rate of growth.

Representative REUSS. Thank you, Professor Fromm.
Professor Bratt?

STATEMENT OF ELMER C. BRATT, LEHIGH UNIVERSITY

Mr. BRATT. I have no prepared statement. I think it is time that we were getting into the discussion. I might just make one or two very minor points.

With regard to Professor Fromm's point about Government purchasing, I think it might be well to recognize that the Defense inventories of the Government showed a very substantial decline between 1957 and 1958, related to that recession. According to the DOD records, they were down from almost $53 billion to about $46.5 billion in 1958.

This might highlight some of the particular influence that the Government had at that time, and in this connection I would emphasize the need for inventory in understanding economic conditions beyond business inventories which are usually considered. The inventories of the Government can have a substantial influence, too; therefore perhaps we need fuller records on a wider basis.

The only other point I would make is with regard to the meaning of the kind of inventory data we need in relation to economic change, because I think this depends a good deal on the kind of behavior that exists in the economy.

For instance, a great deal of emphasis is made, and properly, on the relation of inventories to orders. But frequently it would appear in analyses made by economists that they are assuming that these orders are tailormade orders.

I might point in this connection to what I think is a substantial advance that this study we are now discussing, entitled "Inventory Fluctuations and Economic Stabilization," has made along some lines on the needed information.

[2] See Elmer C. Bratt, " 'Availability and Reliability of Inventory Data Needed to Study Economic Change,' Inventory Fluctuations and Economic Stabilization," pt. IV, op. cit., for a discussion of these matters.

For instance, in Mr. Stevenson's paper in part IV, he tried to get at this question of the extent to which orders relate to tailormade goods and, as I interpret his figures, these amount to only 10 percent of total business inventories.

I think that you can look at this in another way. Many of the models that are developed in the hearing papers assume that the inventories which businessmen collect are largely the results of inventories acting as a buffer between consumption or sales and production.

Now, it would appear to me that the extent to which this happens varies considerably over various phases of the business cycle.

In this connection I would think that on anticipations reports we should recognize that the problems of inventory accumulation may be very different in sharp recessions than they are in periods of reasonably good conditions; that businessmen may be worrying in a recession about inventories as the point to which they are directing their attention, while in fairly good conditions they may not worry about inventories. They just let inventories act as a buffer, and they pay little attention to them.

I do not want to continue this because I think we should get into a discussion, but I thought it might be well to point out these factors.

Representative REUSS. Thank you, Professor Bratt.

Dr. Darling, would you ask any question that are suggested to you.

Mr. DARLING. Perhaps it would be well to see whether the panelists at this time would want to comment on what the others have said, because each has alluded to some extent to the remarks of the others, and it might clarify things if that were feasible.

Representative REUSS. Whoever feels like commenting should feel free to do so. Dr. Jaszi?

Mr. JASZI. I have two comments on Mr. Fromm's paper, one negative and one positive. I had better start with the negative one so I can end up with the positive one.

Mr. Fromm does not approve of our publication policy or about the terms on which we make unpublished data available to private researchers.

Our general principle is that we publish and release data only if we think that they pass a certain standard of reliability. We do not want to pass out data that we think are unreliable. We do not want to do this partly because we do not think it is a good idea, just on general grounds, and we do not want to do it also, if I may say so, in terms of self-defense, because if we put out a lot of data that are subject to a very big margin of error, and they later get changed, then we come in for a lot of unfavorable publicity and attacks, and it is just not a very pleasant situation to be in.

So for these two reasons, it is our general policy not to publish data and not to release data to private researchers unless we think that these data have a certain standard of reliability.

Now, the more you get into detail the less reliable the data are. That is just a statistical fact. There is such a thing as offsetting error, which we observe all the time. We have a lot of error in the detailed estimates, but by the time we aggregate and publish only broader components much of that error is offset, and our broader components, the kinds of things we do release and do publish, benefit tremendously from this phenomenon of offsetting error. I would say that offsetting error is the guardian angel of national income estimators. If there were no offsetting error we could go out of business.

This is the reason, this is why, we do not give out readily, freely, generously, all this detail that you want, Mr. Fromm, and that very many others also want. Now, I would not say dogmatically that we have drawn the line exactly at the right place. Maybe on occasions we have been a little too hardheaded about this. On the other hand, on occasions we have given out detailed data and we have regretted it.

But I am perfectly willing to discuss in specific instances, whether we ought to go a little further, be a little more generous, about this kind of thing. But what I want to emphasize is that our general principle is a sound one, namely, not to hand out indiscriminately all kinds of detail which we think is basically unreliable, so that the analysts who use them in econometric and other analyses are essentially just fooling themselves because they have such a big margin of error in there that it just could not very much help in economic analysis.

So I think we have a sound principle there, and I must disagree with you in your general statement that our policy here is wrong. Our policy is right. Maybe it has not been always applied quite correctly, but our policy, I think, is right.

Where I would like to support you is with respect to your recommendation about better contractor obligations data. I think this is tremendously important.

The issue, the simple issue, here is this: Most of the information that we get now on Government purchases, all the comprehensive information that we now get about Government purchases, is timed at the date at which the products are delivered to the Government, broadly speaking.

This is not when Government procurement has its impact on the economy. In fact, if you want to exaggerate, this is the time when the impact of Government on the economy ceases. When Government procurement has an impact on the economy is much earlier, beginning when the order is placed, that is when the order is placed for a tank, for an airplane, or for something else, that is when the impact starts. You might even argue that it starts a little earlier, but the order stage is definitely when the impact starts, and it would be very important to have a good set of data beginning with orders and then tracing through the orders systematically to the final point when actually the Federal Government pays for those orders. A consistent set of data that starts with orders or conceivably even with the congressional appropriations and then traces through everything on a systematic basis to the very last step when the check is paid by the Treasury.

This kind of information would be extremely helpful. With a considerable amount of product detail—to be helpful you would have to have product detail—and I think this would be a great and important addition to our present information on the economic impact on Government activity. So in this respect I heartily agree with your comments.

Representative REUSS. Mr. Fromm?

Mr. FROMM. I am sorry if Mr. Jaszi construed my comments to infer that the Office of Business Economics has not been very helpful in the past, because I have certainly been one of the people who has benefited more than most, and I did not mean to suggest that the

OBE was stifling academic enterprise throughout the colleges and universities in the country.

I would like to reply to the two points Mr. Jaszi made. First, on reliability, sometimes we are faced with the difficulty that there is a body of unreliable data and there is nothing else. The question then becomes, is it better to use unreliable data or to make some a priori assumptions as to the true magnitudes of the data. I think in many instances it is superior to employ the data, recognizing that they are unreliable, and then put confidence bands around whatever conclusions are reached, rather than not doing the analysis at all or just making arbitrary assumptions. That is why I believe that, at times, the unpublished OBE statistics could be helpful in the elimination of dubious or untested data approximations.

On the second point, on publication, I am not suggesting that data be published that are felt to be unreliable. I think this would be doing both the profession and the OBE a disservice, but there probably is a middle ground where we can profitably get together and make use of what the OBE possesses and still not issue it for publication.

Mr. JASZI. The middle ground, Mr. Fromm, is very hard to maintain, I can tell you from experience. In 80 percent of the cases where we have operated on this kind of assumption, somehow the data in the end had a way ot sneaking into publication, and there it was. So, in principle, this sounds very good, and I am all in favor of it. But it is not so easy to apply in practice.

Representative REUSS. Any other comments from the panel?

Mr. MODLIN. Only to be impressed by the testimony on the need for data on the impact of Government on the economy. It is becoming almost a crescendo, for good reasons.

Representative REUSS. Dr. Darling?

Mr. DARLING. I think this point we have just been discussing, the impact of Government procurement on the economy, might be pursued just a little further here to see what kind of a conclusion comes out of it.

I take it there is pretty much unanimous opinion that this ought to stand very high on the list of priorities.

Representative REUSS. Dr. Darling, could I interrupt for a moment? I have just had a note that I am required to be over on the floor. However, since the remainder of this discussion is under your aegis anyway, I will ask you to continue the discussion until you have thrashed out what is on your mind. At that time, the hearing will be adjourned until 10 o'clock tomorrow morning in room 4200 of the New Senate Office Building where we will take testimony from Mr. Martin of the Federal Reserve System.

Before going, I want to thank you members of the panel for your very real contribution to our inquiry, and I hope you will accept my apologies for needing to go over to the floor. There is something about Yugoslavia and Poland afoot.

Mr. DARLING. Mr. Fromm and Mr. Jaszi have both spoken somewhat about the particulars of need in this area of Government procurement.

You, Mr. Jaszi, mentioned the desirability of being able to trace the procurement, starting with the procurement, and then the flow of orders that results from this, and mentioned the desirability here of, perhaps knowing something about the product that is being desired.

I think Mr. Fromm mentioned in his statement the question of the agency that is ordering.

Wouldn't it be well to first see whether anyone else has something—if there is any disagreement with this or any addition to the need, so to speak. It might be also well to inquire into what the difficulties are and why we have not gone any further than we have on it.

In this connection, Mr. Weidenbaum testified this morning, following Mr. Hitch's testimony, and raised questions here, too, and I am wondering whether a comment from him would not be helpful here.

Mr. WEIDENBAUM. Thank you, Professor Darling.

I think Dr. Jaszi, in his testimony, summed up the need quite clearly for measurements of the various stages of the Government's procurement and expenditure process.

The only comment I have to make is that he stated forcefully and vigorously in 5 minutes what it took me close to an hour to state this morning. I am delighted to see the agreement.

Mr. DARLING. Mr. Modlin, can I ask you, as a representative of the Office of Statistical Standards, what you conceive to be the difficulties at the present time in implementing such a service?

Mr. MODLIN. Oddly enough, the basic difficulty, I think the fundamental difficulty, is one of deciding what concepts are the best ones to measure. Even that is oversimplifying the statement of the problem, because one wants some data on a current basis, other data less frequently. This means that there is a multiplication of the problem of stating the concepts on which measurement is needed.

This, I think, is the immediate problem that is the most important one to try to resolve.

Mr. DARLING. What is currently being done in the Office of Statistical Standards to the end that this be achieved here, let us say, that these decisions be made? Is there a need, for example, for a conference of people from the Office of Statistical Standards and others, researchers and so on, to reach some kind of conclusion with respect to these needs or is this being done?

Mr. MODLIN. We have begun already within the Federal agencies to try to ascertain their needs, and the next step is to consolidate the statements of needs that we have. Then we need to hold exploratory sessions to discuss the various suggestions and try to come up with some kind of determination of a specific statement of data needs.

Mr. DARLING. Would the needs of academic and private research organizations be taken into account in final sessions to determine needs?

Mr. MODLIN. It will be, I can assure you, an exceedingly lengthy list, even if they are not. I think the question, your question, is more, Is there any formal mechanism for being sure that their needs are met? The answer is, We have not got that far. I just do not know what the answer will be.

Mr. DARLING. Mr. Jaszi?

Mr. JASZI. I would like to add two other difficulties to the main difficulty which Mr. Modlin mentions. One is an extremely simple one, and that is just the difficulty of hiring a person, of finding a good person to work on this problem. I have been looking now from the standpoint of the Office of Business Economics for quite a while for somebody to take on this job and to actually do it, and it is just very hard under present circumstances to find a good person who would be willing to spend half a year or a year to work this thing out. It is

partly the salary scales, it is partly other opportunities, and so forth, but this is one very, very real difficulty in any of these things that we are discussing, that in the Federal Government today we just find it very difficult to hire competent personnel to do these important jobs.

The second difficulty which I think I would add is that even if we got over these definitional difficulties and conceptual difficulties to which Mr. Modlin is referring, I think we would run into another set of difficulties, simply in getting the information from the various agencies, because the actual reporting programs of the various agencies now, the way their books are set up, and so forth, would not be adaptable to this kind of thing immediately. I think there would have to be a considerable reorientation of the way they get the data, the Defense Department and other agencies, before we really could get the timing, the product breakdown that we want, and the concepts and the definitions, and so forth.

Mr. MODLIN. Finding ways to produce the needed data is, as Mr. Jaszi indicates, a major follow-on project to the one of determining what the needs are.

Mr. DARLING. Professor Fromm.

Mr. FROMM. I recognize that the task of determining the needs exactly and the precise structure of how the data are to be acquired is an extremely difficult problem, and I can see that it might take several years to be resolved. In the meantime, we have absolutely nothing in the way of data. However, I should think it would be feasible to shortcut some of this by determining those needs which, obviously, are common to all users.

For example, at the moment we have absolutely no idea of what the obligations of the Government are on a short-term basis. Now, every Government agency knows the contract commitments it has made within the last month or within the last quarter. You can walk into any contract office and talk to the contract officer and he will have a ledger by appropriations account. He will not be able to give you detail on obligations by two-digit industries or by products or whatever data reporting structure is finally selected, but he should be able to furnish total obligations. If only that piece of information is provided, we will be a long step ahead of where we are.

Mr. JASZI. Mr. Fromm, I thought we had Defense Department obligations monthly or quarterly?

Mr. MODLIN. Monthly.

Mr. WEIDENBAUM. It is my impression that each agency of the Government reports to the Bureau of the Budget, certainly quarterly.

Mr. JASZI. The Defense Department publishes it, Mr. Fromm.

Mr. Fromm. That is true, but the Defense Department, I believe, is the only Government agency which does so, and then, only on an aggregative basis.

Mr. DARLING. What other agencies of Government do publish in addition to Defense their obligations on either a monthly or quarterly basis? Are there any other agencies?

Mr. MODLIN. I do not know the answer.

Mr. DARLING. With respect to Mr. Fromm's question, which needs following up, is there any reason why this kind of thing, this kind of procedure, collection of data, could not proceed immediately, namely, simply a monthly or quarterly listing of obligations by the agencies?

Professor Fromm is indicating he thinks these data could be rather easily assembled.

Mr. WEIDENBAUM. There was a period where the Treasury Department published what was colloquially called a white book, I believe, on a monthly basis, showing the obligations incurred and other data for each Government department.

Certainly that type of data is required under the budgetary control process to be reported for each appropriation account by the agency to the Bureau of the Budget.

In this case it is a question of aggregation and publication.

As far as the breakdown of these obligations into meaningful economic categories, I think the key point here is the classification of obligations by so-called object. This right now is a half-way house.

It certainly is not a clean break between obligations represented by contracts with private industry or hard goods versus soft goods, and the other national income account type of breakdown. But a variation, a change, in the classification of obligations by object as part of the budgetary control and reporting process could yield this information, I believe.

There would be cost involved.

Mr. MODLIN. There is currently a study by the Bureau, the meaningfulness of obligations data, which, presumably, would result in a determination as to whether they should be published along the lines that Professor Fromm is suggesting, but the study is not yet completed.

Mr. DARLING. Would you be able, Mr. Modlin, to give the subcommittee a brief statement for the record which would just simply describe the current status of work in this area that we are just treating; namely, the obligations of all Government agencies and the possibilities for early publication of this data.

(The following was later submitted for the record:)

Since December 1960 the Treasury Department has published a quarterly series of total gross and net obligations incurred, plus net unpaid obligations of executive agencies of the Government. The Bureau of the Budget is conducting an exploratory study on Federal obligations data. The purpose of the study is to determine the detail (i.e., the classification basis for reporting Federal obligations) desired and the feasibility of obtaining such data on a current basis.

Mr. DARLING. Dr. Bratt, you had a question?

Mr. BRATT. Well, this is not on obligations data. I think obligations data represent various kinds of particular problems in data needs in studying economic change that could be extended substantially.

But if we get back to the subject of inventory data and relate this to Professor Fromm's point, it is a little hazy in my mind, but I think his point runs something like this: that you should have current information on the operational factors, market situation of each firm, and be able to build this up to the total economy, or maybe it is not quite this comprehensive.

If I understand Mr. Jaszi on this point, he, too, would visualize a similar need. Perhaps he would not express it as extremely, but it is a problem of putting together a lot of information on a micro and macro basis.

I do not disagree with this, as it is probably a desirable need, but I would like to emphasize what is implied.

To begin with, I think there is a very important implication, if you are talking about inventory data, involving a completely new philosophy of statistical data. You are now asking for planned data on inventories throughout the economy, not data that are almost wholly a matter of byproducts of various things that are done in the economy.

This is a complete reformulation and, secondly, I would like to emphasize that your hypotheses, as now developed, may or may not be as clear cut as you would like to have them with relation to the aggregative economy.

The National Bureau of Economic Research just released, within the last couple of weeks, the papers at a conference on the flow of funds. Efforts of people in that conference, including Dean Wiler of Purdue, and of Professor Gurley, indicate great difficulty in reaching conclusions about what happens in the financial fields within the realm of the data we have, so I am not sure you would get the conclusions you want until we get, say, some coordination between the flow of funds data and income and product of which Dr. Jaszi is the godfather.

So my two major points are that the kind of thing that is being asked for is a complete remodeling of the whole framework of statistics, so no wonder Mr. Modlin has difficulty in telling you how you are going to get it; and, secondly, that many of the inferences that the econometricians would like to set up in their equations are not very firmly founded with regard to aggregative data because we do not have enough information about the aggregative economy except on an income and product basis.

Mr. DARLING. Mr. Weidenbaum.

Mr. WEIDENBAUM. On the question of recommendations, I would like to address myself to the subject of Government inventories and the Government procurement and expenditure process.

I think the needs in terms of priority are quite clear, and I think the tools are close at hand, that is, of the major stages of this process—appropriations, obligations, contract letting, private production, and finally expenditures. Appropriations we have on an annual basis and because of the nature of the appropriations cycle monthly or quarterly data would not be very meaningful.

In terms of obligations we have internally certainly at least a quarterly obligation series in the making.

You have the raw data for it. It certainly can be adjusted to meet our major needs in terms of breaking out external contracts, if you will.

In terms of production, as I take it, essentially it is to improve and break out inventories of Government producers.

I think we should make some mention of the heroic efforts on the part of people, particularly in the Commerce Department, to make do with the very fragmentary data they already have along these lines.

As far as the expenditure end of it, this is a stage to which most of the work in terms of fiscal policy and public finance statistics has been devoted, and we are in relatively good shape although certainly refinements are required. So essentially if we work on the obligations figures as part of the budgetary control system, if we can break out Government contractor inventories as far as measuring that important phase of production, I think these two recommendations would represent the two high priority, relatively low investment with a high yield payoff.

86721—62——14

Mr. DARLING. May I ask the representatives of the Department of Commerce and the Office of Statistical Standards, Mr. Jaszi and Mr. Modlin, to comment on, first, what work might be currently in progress with respect to breaking out—trying to break out the Government contractor inventories, the problems that are involved there, and the hope for the future with respect thereto.

Mr. JASZI. I think I will pass this on to Mr. Modlin. I have been aware that we have been trying very hard to get this kind of breakdown, and we have had numerous working sessions with the Census Bureau to try to adapt the basic inventory data to give this type of breakdown. But evidently there are very great statistical difficulties in getting at it and I think Mr. Modlin knows more about this than I do.

Mr. MODLIN. The best illustration I can give is the result of the revision in a survey that took place in 1961, last year—last summer it was. The Census Bureau had a survey in which it collected information on sales, new orders and backlogs of orders, from aircraft manufacturers, aircraft engine manufacturers, and manufacturers of related equipment. Basically, this was a report covering the manufacturers of aircraft—airframes that fly when engines are put on them—and the manufacturers of the engines.

There was in the survey an "all other" category. Since the same manufacturers manufacture missiles and space craft and missile engines and the like, the "all other" category became of such importance and magnitude that it was obvious that it should be separated into its major components, basically into products. So the survey was expanded to include missiles, space vehicles, missile engines, research and development, items of that sort. It is a quarterly survey. It gets separate data on sales to Government and sales to others. At the time the survey was being revised the subject of getting inventories separately for Government-related inventories, and other inventories came up. Discussions with representatives of the firms who would have to report the information indicated that wherever they had Government and non-Government business in the same facility they didn't have inventory data separate. The best they could do if they reported anything was to make a guess as to what proportion of the inventory was Government related and what was not. Unfortunately for the immediate problem, many of the firms who are covered by the survey, are not just Government contractors. One can name them quite easily and it becomes obvious that they have many other types of activities. What they have said time and time again is they don't keep their records separately, and the reporting of the information would be a considerable job for them.

Mr. DARLING. May I just interrupt for a minute here?

Mr. MODLIN. Yes.

Mr. DARLING. Is not the Department of Defense charged with seeing that a defense contractor is not running up his costs unduly by holding too large an inventory, and on this account would not a defense contractor be required to submit evidence to the Department of Defense with respect to the materials he has on hand for defense contracts?

Mr. MODLIN. This depends very much on the type of contract—the answer is that the answer varies by contract. On firm fixed price

contracts, for example, the Defense Department goes into no detail at all. The contract says the price of so many items is thus and so, and the contractor handles his affairs just as he likes. He will be paid when he makes delivery, unless there is some other arrangement for payment.

If it is a CPFF contract, the contractor usually submits a monthly request for payment for expenditures under the contract. The detail that would be submitted to support a claim for materials purchased would not necessarily say that this material is in inventory or it is not in inventory, but rather "We purchased so much in materials during the last month." The Defense Department, at least as I understand the contract administration, would be concerned to see that these are legitimate expenditures under the contract, which are reimbursable, but not necessarily that they are in inventory or not in inventory. In other words, if they have been consumed in the production of the item being manufactured——

Mr. DARLING. Wouldn't there be a request for a return on working capital funds tied up in inventory, and the imputed interest charge that entered into a cost under the contract?

Mr. MODLIN. Usually this would take the form of a request for the payment of the amount of the materials purchased. You see, if a purchase is made during a month, and a bill is submitted at the end of the month for that material, then it is only 30 days that the contractor has to wait, even if it is that long, before payment.

I don't want to appear to have all the answers on this, because I don't. Mr. Hitch indicated this morning that the Defense Department was concerned about the size of inventories held by contractors and, as a result of some policy changes at the Defense Department, the contractor inventories had been reduced.

I am inclined to think that a way of going about getting the data, perhaps a more feasible way, given the limitations in the quality of the data that would be produced from a survey, would be to try to work with the relationship between, perhaps, orders from or, perhaps, sales to Government to total orders or sales and apply this to the aggregate inventories for the reporting unit to get an estimate of Government-related inventories. For example, in the particular survey, which is a quarterly survey, that I have in mind there is nothing on inventories data. There is, however, the Monthly Industry Survey which at the end of a quarter asks these same firms: "What are your total inventories?"

One could probably develop a procedure for estimating the proportion of these inventories reasonably applicable to the defense business, and this might produce data, given the balance of costing and needs, of sufficient quality to serve the purpose.

It would not be as good, of course, as if one labeled every item purchased as being "for Government contract" or "not for Government contract."

Mr. DARLING. Those are the difficulties.

Is there a program in process, still in process, to see whether further work is feasible in this area?

Mr. MODLIN. No. What has been done is to make comparisons of the backlog information reported in this survey, let's call it the

"backlog" survey, and the Monthly Industry Survey by the same firms, to see whether the data are the same. The differences are so slight that we can forget about them. What I am trying to say is that we have aggregate inventory data for at least some firms for which we also have Government backlogs, sales, and new orders data. By relating the sales to Government, backlogs on Government contracts or new orders from Government to the total for the particular item or items a factor could be developed for use in estimating Government-related inventories. So for these we could experiment with estimates of inventory.

This would be only for the firms who are respondents in the "backlog" survey, and not for all defense-related inventories or Government-related inventories.

To answer the question more specifically, there is no active program now because of the discouragements we have had in the past when we have tried to do it. Incidentally, we tried also to get the same information in Monthly Industry Survey about 2 or 3 years ago and ran into the same reporting problems. We were not able to overcome them.

Mr. DARLING. Does any other panalist wish to comment on this matter of trying to break out contractor, Government contractor inventories?

Mr. Weidenbaum, you said earlier that you thought the materials were at hand. In view of what has just been said do you have any comment on this?

Mr. WEIDENBAUM. As the chairman stated here this morning I am not here as a representative of my company but as an individual.

Mr. DARLING. Do you have any general experience that would be helpful?

Mr. WEIDENBAUM. Well, I was just checking our own, my own, company's annual report and we, of course, do not break out inventories by type of customer, that is Government versus civilian. I am sure statistical estimation would be required and as I suggested this morning, maybe for the tiers of subcontractors, sampling or some other method like that would be the feasible alternative.

I do know from my company's experience in filling out Government questionnaires, depending on the clarity of the questionnaire, the type of information, we certainly go to a significant amount of time and staff effort in providing record data where it is available, or as we have done for congressional questionnaires, providing the best estimates that we can.

I am sure this is the spirit in which most of the companies I am familiar with in my own industry, would take this.

On the other hand, people filling out the questionnaires will always bring up the reporting burden and it is a real one, no question about it.

But I think this is an important enough area that the effort is worth it.

Mr. DARLING. Professor Fromm, from the point of view of economic research and economic analysis, do you believe that this is a large need, that is, this question of breaking out defense inventories or Government contractor inventories more generally?

Presumably a great effort and cost is involved in doing this so that the question is important as to how great the need is for the data?

Mr. FROMM. I do not think that I would be convinced that breaking out inventories per se is as fruitful as taking an approach which is less sophisticated. Namely, we can probably compare the Government obligations to a particular company, a contract let, and so forth, with the subsequent actions of that company in terms of its total purchases, in terms of employment, payrolls, materials, services, and so forth.

After all, there is more to the production process than merely inventories and what we are interested in is the final impact on total product. If we are concerned about total product, we want to take account of all these other factors.

Perhaps going to all the trouble of estimating defense inventories is not really worth the effort, because then when you are all through, you have only a partial answer to the total question that you are trying to resolve.

Mr. WEIDENBAUM. Could I rephrase the question, at least as I see it; at any given point in time what is the volume of private production on Government account?

This is the question.

Mr. FROMM. That is correct.

Mr. WEIDENBAUM. This is the question we are trying to answer.

You use the inventory breakdown because it seems to be the most appropriate.

Mr. DARLING. Dr. Bratt?

Mr. BRATT. Could I ask Mr. Modlin in this connection if you consider private production on Government account, what this problem would amount to? It is easier to talk about inventories. If you go not only to major contractors, and if you carry the process back to subcontractors and the component parts that these major contractors buy from other firms a larger total is involved.

Would you have any idea what part of the total impact on amounts of production or inventories would be involved in these other phases?

It would vary, of course, at different times.

Mr. MODLIN. It would vary. I should know, I should have brought along the most recent report from this aircraft and missile backlog survey, because there is in it information on work on subcontracts by the respondents to this survey, which, while it isn't the answer to your question, it is the best thing we would have.

Mr. DARLING. Would that be a document that would be useful in the record or don't you believe so, the one you have just referred to?

Mr. MODLIN. I don't know. It is quite easy to get, and suppose I send you a copy and you decide once you see it.

(The following was later received for the record:)

The Bureau of the Census report "Backlog of Orders for Aerospace Companies" does not contain data on subcontracts and purchase orders. The Department of Defense publishes data on payments by selected large prime and subcontractors to other firms. Data for the past 5 fiscal years are contained in the following table, which was taken from the Department of Defense publication "Military Prime Contract Awards and Subcontract Payments," July–December 1961.

Defense small business subcontracting program (by fiscal years)

[Dollar amounts in millions]

	1957	1958	1959	1960 [1]	1961
1. Number of contractors reporting their subcontract receipts and payments to Department of Defense	298	294	298	298	309
Military subcontract payments by reporting contractors—					
2. To small business concerns	$3,562	$3,242	$3,336	$3,587	$3,482
3. To other business concerns	5,752	5,784	5,808	6,079	5,898
4 Total, subcontract payments	9,314	9,026	9,144	9,666	9,380
5. Percent of total paid to small business concerns (line 2÷ line 4)	38.2	35.9	36.5	37.1	37.1
6. Military contract receipts by reporting contractors from prime and subcontract work	$16,992	$17,479	$18,704	$19,095	$19,754
7. Percent of receipts paid out to all business concerns (line 4÷ line 6)	54.8	51.6	48.9	50.6	47.5

[1] Revised.

Source: Office of the Secretary of Defense, Department of Defense, "Military Prime Contract Awards and Subcontract Payments," July-December 1961, Washington, D.C., p. 44.

SUBCONTRACTS

Table 19 shows data on the Department of Defense small business subcontracting program for fiscal years 1957 through 1961. In the 5 fiscal years from 1957 through 1961, small firms averaged $3,442 million per year in reported subcontract receipts and $3,678 million in direct prime contracts, a total of $7,120 million in defense business per year. In this same period, average annual military prime contract awards to all business firms were $21,599 million.

Not all military prime and subcontractors took part in the program, and therefore the reported volume of subcontract payments to small business firms is understated. Up to January 1960, the Defense small business subcontracting program was on a voluntary basis. On January 1, 1960, the program became mandatory on all prime contractors, and also on all subcontractors, who obtained contracts of $1 million or more with substantial subcontracting possibilities.

The subcontract reports are in terms of billings or cash payments, and therefore are not necessarily comparable to prime contract awards during any short period of time. Over a period of years, however, the two sets of data provide a good indication of the total share of the Defense program received by small business firms. As indicated in the following table, small concerns obtained about one-third of all military procurement from business firms. In addition, they obtained an unknown amount of subcontract receipts from large prime contractors and subcontractors who did not report to the Department of Defense.

[Amounts in millions]

Fiscal year	Military prime contract awards		Military subcontract payments to small business	Total of prime contracts and subcontract payments to small business
	All U.S. business	Small business		
1957	$19,133	$3,783	$3,563	$7,345
1958	21,827	3,729	3,242	6,971
1959	22,744	3,783	3,336	7,119
1960	21,301	3,440	3,587	7,027
1961	22,992	3,657	3,482	7,139
5-year average	21,599	3,678	3,442	7,120

Mr. WEIDENBAUM. In this connection, for whatever they are worth, a number of input-output techniques have been used on a number of occasions, among other purposes, to gage the amount of Government, and particularly military production, specifically in terms of the question, "Given a reduction in military demand what would be the impact on the various industries?"

To the extent the data permit, including work done by subcontractors and supporting service, you still get the tremendous concentration of the total volume of Federal Government military production done by basically the same industries that are the major prime producers, aircraft, electronics, shipbuilding.

Mr. DARLING. Dr. Bratt.

Mr. BRATT. I would like to emphasize that this goes further than subcontractors because it seems to me that these major contractors buy a lot of components or products of various sorts that aren't really subcontracted out.

Mr. WEIDENBAUM. I should have said suppliers.

Mr. BRATT. Yes, suppliers.

Mr. DARLING. Well now, I would presume that all people here consider the problem we have just been discussing to be very high on any priority list of what needs to be done, the general subject of the question of the impact of Government procurement on the economy.

It might be well to see what comments we have here with respect to what we might call the second level of priority.

What, gentlemen, seems to be the second item on the list of priorities?

Dr. Fromm?

Mr. FROMM. Well, I want to get to that by addressing myself to Professor Bratt's previous comment on whether I am trying to reformulate the whole theory of the firm. I am not, but we have recognized in the past, and I believe the view is generally accepted, that firms undertake investment in inventories and in fixed plant and equipment on the basis of the anticipation of future sales.

Therefore, if we are going to analyze the behavior of these units, then one of the things that may prove fruitful is to compare individual firms' anticipations with their actions, overtime, observing how they alter their behavior as anticipations are revised. Thus, I would suggest as the second priority item, that what we should do is for individual companies or their divisions collect data, preferably on a market basis, so that we may follow through the transmission of demand. The data gathered should include both firms' anticipations and their actual experiences.

At the same time I am not saying that financial variables are not important. We would certainly like to measure these as well. If we could get all the data we want, this would be extremely helpful. However, I doubt whether this is economically feasible at this time.

Nevertheless, the Government is now surveying company anticipations as to investment, inventories, sales, and so forth. Also surveys are being conducted to determine actual sales, inventories, and orders. What I would propose is that this data be gathered from the same source at the same juncture, in order to enable time-series comparisons of the actions of an individual firm and cross-section comparisons between firms.

One more point concerning the question of aggregation raised by Professor Bratt. I am well aware of the dangers of aggregation, and this is one of the reasons why I am advocating that comparable data be collected from individual reporting units. We are then not confronted with the situation where sales data have been gathered in one sample and orders data from another, resulting in differences in coverage and potentially invalid and unreliable conclusions.

Mr. DARLING. I want to clarify my own understanding of what this point amounts to that you have just raised.

Do you mean that you would like to be able to go to the Department of Commerce and secure this data, sales, inventory, orders, and anticipations for a specific firm; is this what you mean?

Mr. FROMM. I am suggesting that the Department of Commerce collect this data and make whatever use of it it chooses for its own aggregate reporting purposes. For the investigations that Ruth Mack, Mike Lovell, myself, and many other people would like to undertake, I am proposing that some means be found of prosecuting these analyses. Either the data might be released on the same basis that the Bureau of the Census has utilized in the past (namely, appointing census agents), or the researchers might prescribe the computations they desired and the Department of Commerce could process the data in conformity to those instructions, never revealing the individual company statistics to persons outside the Department.

Mr. DARLING. Before we ask others to comment on this point, would it satisfy the needs of the researcher who is interested in this microbehavior if 5 firms in the same industry were aggregated and data released in that form or 10 firms?

Is the requirement that it must be an individual firm or could you group a small number of firms together and release data in that form?

Mr. FROMM. Well, certainly one could do this, but as Professor Bratt has pointed out, and as indicated in the notable work of Professor Theil on the aggregation problem, this tends to becloud some of the results. If it is not really necessary to aggregate, we should not do so.

Mr. DARLING. This, it seems to me, raises the question of the relationship of the Department of Commerce as a supplier of data to that of the private research organization which might make funds available for research where this data would then be collected by the researchers.

Would some member, other member of the panel comment on this kind of a need and the feasibility and the desirability of making such data available to researchers who are interested in this area.

Would Mr. Jaszi comment on that?

Mr. JASZI. I don't think I can add very much to what I have said on this subject before.

I would like, however, if you don't mind, to talk about priorities for a moment.

Mr. DARLING. Yes.

Mr. JASZI. I think we have to distinguish between priorities for new research and priorities for existing data. I would certainly agree with you that as far as new research is concerned this impact of Government expenditures on the economy has a very high degree of priority, if not the first priority, like you indicated. Offhand, I can't think of anything that I think actually has a higher priority. I think it is a very important project.

But I do want to say that we should not neglect the priorities in connection with the gaps in the existing data, and I think that the kind of things that I have mentioned in my initial comments referring just to the improvement of the data that exist now should receive a very high degree of priority, and that we should not go off on a tangent just thinking about new and interesting projects and forgetting the fact that there is a lot of existing information that badly needs improvement.

Mr. DARLING. Dr. Bratt?

Mr. BRATT. For the record, I would like to be permitted to deny having any thought or any intention of accusing Professor Fromm of trying to develop a new theory of the firm.

In fact, I would have great respect for him if he were. But this was far from my mind and far from what I was trying to say, and I am afraid perhaps reflects on the clarity of the way I talk, because what I was saying was that I think this leads to a complete new philosophy of the development of statistical data.

That the kind of statistical data we are now collecting on inventories as I said before is a byproduct almost wholly, and this has been true even in census surveys, like the industry survey, because if I call up someone in OBE or talk to someone in Commerce about inventory samples they immediately talk to me about sales samples.

They are thinking of inventories wholly as a byproduct, and this is what I was saying. I don't disagree with the need for a reformulation. In fact, it is needed, but this is a pretty deep reformulation. If you get away from the kind of idea that statistical reporting exists only because some foolish professors want some data and that you have to satisfy them because they might make you trouble if you don't or something of this kind, you may approach a new order of statistical needs. But as far as Professor Fromm's priority is concerned, I think from the point of view of understanding the economy is central and probably I would rank it about the same place he does. I think the most important thing we can do right now is to find the relation between micro situations and macro situations and I have high respect for the kind of thing that Mrs. Mack has done and the paper that Messrs. Holt and Modigliani produced in the set of papers we are discussing.

I think we have a little trouble, though, as Professor Fromm seems to have, in really spelling out what kind of data we want in this connection, but I think he placed the emphasis correctly when he pointed to the formulation of anticipatory data.

Mr. DARLING. Dr. Fromm?

Mr. FROMM. I certainly agree with Professor Bratt.

But in light of Mr. Jaszi's remarks, I don't think there is any point in taking our present data and refining it so it is perfectly accurate, and then discussing that this is not the data we actually want.

We first have to decide what the nature of the statistics that we are seeking is, and once we define that, then we can sit down and say, "All right, now what are we collecting? How can this data be improved to give us what we need?"

I would not want to remedy these inadequacies that have been mentioned willy-nilly. I would want to do so within a framework which in the end will give me a whole set of statistics which I can then use for analysis.

Mr. JASZI. Obviously, the statistical program should be framed with a view of being helpful to economic analysis, but there are just certain very simple things, simple standards of reliability that have to be met, whatever the particular shape the analysis takes.

I am quite convinced that, for instance that a reliable revaluation of inventories from book values to current values is important, quite independent of what kind of theoretical scheme Mr. Fromm develops.

Therefore, I do believe that while his remark is certainly logically very cogent, it has very little direct practical relevance in connection with the major gaps which I mentioned.

Those major gaps just will have to be filled, whatever kind of theoretical framework Mr. Fromm or anyone else developes.

Just to give you one more example, I have mentioned, for instance, that what we get now on wholesale inventories is just confined to merchant wholesalers and that about 30 percent or more of wholesale trade is not now covered by inventory data.

Well, that gap just in ordinary commonsense has to be filled quite independent of what kind of analysis we want to make.

Mr. DARLING. Mr. Modlin?

Mr. MODLIN. I am not sure that the data gap exists for this reason: By definition, a manufacturer's sales branch is a part of a manufacturing organization which reports its inventories in the monthly industry survey. So if you are saying that you need data for manufacturers' sales branches separately from an aggregate, this is one thing. But if you are saying that we don't have data that include manufacturers sales branches, I think that is something different. I think we do have those.

Mr. JASZI. First of all, let's distinguish between manufacturing sales branches, and then there are these others that are omitted now, assemblers of farm products and agents and brokers, so my comment certainly holds for those.

Mr. MODLIN. That is right.

Except for the petroleum bulk stations, many of which are owned or which are petroleum bulk stations of manufacturers reporting in the monthly industry survey.

Mr. JASZI. Yes, but the coverage is not adequate at the present.

My information is that a lot is left out of wholesale trade. Also I was told, but on this I may be wrong, that the new census survey which they are planning now, the industry survey, will not include manufacturers' sales branches. I checked up on that specificially yesterday. I may have gotten the wrong information, but I was told that the new industry survey is not going to include manufacturers' sales branches.

Mr. MODLIN. That is one of the things we are going to consider before the new series is introduced.

Mr. JASZI. I hope you consider it so it is covered somewhere. Anyway, this was just illustrative. There are certain gaps which need to be filled and there is not too much to this logical point that one can't formulate any kind of list of gaps that ought to be filled without being quite sure what specific use is going to be made of the data.

Mr. DARLING. Mr. Modlin, may I ask this question of you: In considering the need for improvement in Government statistics, and specifically here in the area of inventories and related data, orders, and sales, is there a policy at each step of these considerations, to bring in outside people who would be representative of users in order to have their needs defined and described as a help, as an assistance to the Office of Statistical Standards.

Mr. MODLIN. We don't bring them in because we don't have to. They come in and we welcome them. There is, as a matter of fact, an organization in Washington of Federal statistics users; it is the Federal Statistics Users Conference, and perhaps Mr. Weidenbaum is familiar with that organization. They do represent a rather broad cross sec-

tion of data users, and they frequently, as a matter of fact, annually, have conferences indicating what they think, as of that time, are the important areas that need study, and make us quite aware of their deliberations.

Mr. DARLING. Just as some other Government agencies have advisory committees to help, assist in decisionmaking, for example, the Treasury Department, with its advisory council, would it be desirable to have an advisory council to the Office of Statistical Standards where members would be chosen to represent various interests and thus to formalize this consultative procedure?

Mr. MODLIN. The only thing that I can see that that would add is a formalization to the existing arrangement, and I am not sure that that would be a great advantage. We do have a group representing labor organizations that is advisory to us directly on statistical matters, we have a business advisory group on reporting problems.

We do not have a formal group of the sort that you suggested.

Mr. DARLING. I am thinking fairly largely of researchers.

Mr. MODLIN. Yes. We do not have a formal group of that sort but I am not sure of the reasons—I think primarily because we think we have access to them through the Federal Statistics Users Conference.

Mr. DARLING. Well now, in view of the time, may I ask all members of the panel whether they have a remaining point that should be brought into this discussion preferably points that have not so far been brought in?

Mr. Weidenbaum?

Mr. WEIDENBAUM. I have a postscript I would like to add to the discussion of the reporting burden—and I make this proposal with some degree of seriousness. It has been my feeling for a considerable period of time that an Office of Statistical Standards would be needed in the private economy, covering the questionnaires of the university professors, research institutions, magazine writers, newspaper reporters, and particularly students working on master's theses and term reports. [Laughter.]

I make this statement wearing two hats, not just as a filler-outer of questionnaires but as someone who assignes term reports to his students, too.

Mr. DARLING. Mr. Modlin, did you have a final point?

Mr. MODLIN. Yes; this is a variation of Professor Fromm's recommendation having to do with collecting related data in a single data-collection project.

If I may, I think a different approach to that is to get away from the operational problems that are inherent in doing what Dr. Fromm suggested, which was to have all the data collected on one form. His solution is an oversimplification.

Mr. FROMM. Yes; that is true.

Mr. MODLIN. The problem remains, though, and it is one that we certainly are taking seriously, and yet we are approaching it in a different way. We are trying to make it possible to relate data reported on different bases, when it is—for whatever reason—that the data be reported on different bases.

To illustrate, the Monthly Industry Survey will be on a divisional basis; as a matter of fact, it might even be on a product basis except for the extreme cost that would be involved. I don't think that a

financial statistics program could be on as detailed a basis, simply because the records aren't kept that way.

Now, it is one thing to say that all economic statistics collected from a firm can't be on the same reporting basis. It is something else to say that it should be possible to relate data reported on one basis with those reported on another basis. This isn't always easy to do. For example, the total of sales reported by all the units in a corporation in the Monthly Industry Survey probably would not be the same figure as the aggregate sales reported by the corporation, simply because of the netting out of intracompany sales. There has always been that kind of problem. All I am suggesting is a somewhat different statement of what I think Dr. Fromm had in mind in the first place.

Mr. DARLING. Does anyone else have anything?

Well, on behalf of the chairman, I want to thank all of you panelists for your great help in this session which I think has been very valuable and we will stand in recess, as indicated by the chairman, until tomorrow morning.

(Whereupon, at 4:05 p.m., the subcommittee stood in recess, to reconvene at 10 a.m., Friday, July 13, 1962.)

INVENTORY FLUCTUATIONS AND ECONOMIC STABILIZATION

FRIDAY, JULY 13, 1962

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON ECONOMIC STABILIZATION,
AUTOMATION, AND ENERGY RESOURCES
OF THE JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The subcommittee of the Joint Committee met, pursuant to recess, at 10 a.m., in room 4200, New Senate Office Building, Hon. Henry S. Reuss presiding.

Present: Representatives Reuss; Senators Proxmire and Pell; and Representative Griffiths.

Also present: William Summers Johnson, executive director; Paul G. Darling, economist; and H. D. Gewehr, research assistant.

Representative REUSS. Good morning. The Subcommittee on Economic Stabilization, Automation, and Energy Resources of the Joint Economic Committee will be in order.

We are very honored to have here this morning Chairman William Martin, Jr., of the Board of Governors of the Federal Reserve System.

With him is Mr. Noyes.

Would you identify?

Mr. NOYES. Guy Noyes, Director of Research and Statistics.

Representative REUSS. You have a prepared statement, Mr. Chairman. Without objection, this will be made a part of the record and, in accordance with our tradition, you may either read it, summarize it, or proceed in any manner you wish.

STATEMENT OF HON. WILLIAM McCHESNEY MARTIN, JR., CHAIRMAN, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM, ACCOMPANIED BY GUY NOYES, DIRECTOR OF RESEARCH AND STATISTICS

Mr. MARTIN. Mr. Chairman, in its continuing assessment of the business situation, the Federal Reserve pays close attention to changes in inventory investment and to the circumstances which give rise to those changes. It is important for all of us to know as much as we can about these matters and I am sure that our analyses will benefit from the valuable background studies which have been prepared for this committee and from the further impetus that these hearings have given to research in this field.

My own view is that inventory fluctuation is symptomatic of, rather than fundamental to, the cyclical behavior of the economy.

From the evidence, inventory fluctuations would appear to be a major factor in intensifying cyclical swings once they get underway.

But whether inventory changes are a major factor in triggering cycles is more questionable. In retrospective analyses of cyclical movements, the association between changes in inventory and in gross national product may seem impressive, yet it may well be that swings in business sales expectations, placements of orders, and Federal expenditures exerted a more fundamental influence. It is possible, at least in theory, for an economy to have stable investment in both plant and equipment and in inventories and yet to experience cycles in output because of fluctuations in these other factors.

In this connection we think it is important to recognize that inventory changes result not only from conscious management decisions but also from causes outside management control. And there is no present means of determining the relative importance of the voluntary and involuntary changes. For these reasons, we must go behind the published statistics, indispensable, of course, as they are, to assess the underlying inventory and production decisions which help determine the strength of consumption and investment demands. Further research, therefore, into the relation of inventories to cyclical fluctuations should be directed not only to improving data on inventory holdings but also toward shedding some light on the decisionmaking processes themselves.

From your committee's invitation, I understand my major assignment today is to comment on the influences of the cost and availability of credit on inventory investment. Necessarily, much of this discussion must be imprecise, for, despite earnest efforts—which include the studies commissioned by this committee—relatively little is still known about the effects of specific financial conditions on inventory policy.

While the cost and availability of credit is one influence on the level of inventories which businessmen desire to hold, it seems obvious that this is not the predominant influence. Unless the availability of credit is extremely limited, businessmen will give more weight in decisionmaking to expected sales trends, the volume of incoming orders, backlogs of unfilled orders, the level of production, the presence or absence of materials shortages, and expected price changes.

If inventories are insufficient, the result may be expensive interruptions in production and loss of customers. The resulting costs usually would be larger than the cost of funds borrowed to carry larger inventory. Moreover, interest is only a small part of overall inventory expense. The total cost of carrying inventories has been estimated at between 10 and 25 percent per year, while interest rates applicable to this type of credit generally fluctuate below 6 percent.

Businesses ordinarily finance their inventories in a wide variety of ways. Besides bank or other short- or intermediate-term borrowing, they may do so by retaining earnings, issuing securities, incurring greater trade debts to suppliers, and by drawing down cash and other liquid assets.

Even the reduction or postponement of plant and equipment outlays or the holding down of accounts receivable may provide inventory finance. In recent years, so-called trade debt has become a prime vehicle with which financially strong businesses help finance the inventories of customers who are either unwilling or unable to resort to

bank or other market borrowing. In the 12 months ending with March 1962, for example, corporations increased their aggregate trade debt by more than $7 billion. The growth in corporate short-term indebtedness to banks, however this is measured, was far smaller.

Furthermore, commercial banks usually exert considerable effort to insure that their business customers obtain the credit they need for purposes such as inventory investment. Banks often elect to provide for such needs by reducing portfolios of liquid and even long-term securities and, on occasion, by limiting mortgage, security, and other nonbusiness lending. Business loans are the bread-and-butter business of many banks, and it is evident to them that a dissatisfied business customer can be lost forever to competing lenders. Additionally, bankers have traditionally regarded inventory needs as one of the most legitimate reasons for borrowing and they consider the meeting of such needs as one of the most appropriate forms of bank lending.

Yet after all these considerations have been taken into account, it seems to me that credit conditions do at times significantly influence inventory policies. Moreover, I think it reasonable to believe that the potential influence of these conditions is greater now than in earlier postwar years, because interest costs are a larger proportion of total inventory costs and because business firms generally have become less liquid and therefore more dependent on credit.

While much of the financing of inventory positions normally comes from internal and nonbank sources, the bank component can be strategic at some times and for some borrowers.

Inventories have several characteristics that make them more susceptible to changing credit conditions than are plant and equipment outlays.

The possible range of inventory mix and level of inventories is wide, while fixed capital investment often requires all-or-nothing decisions; some portion of inventories can be liquidated in case of need, while fixed capital requires long payoff periods; inventory levels can be raised or lowered rather quickly, while fixed capital installations can require up to 2 or 3 years of leadtime and are not halted easily once they are started.

Thus, the initial impact of a change in credit policy on business investment outlays may fall on inventories even though inventory financing requires only a small share of all funds raised.

The potential impact of monetary policy has probably been strengthened by the decline of internal corporate liquidity since the early and mid-1950's and by the currently spreading belief that price increases of the earlier postwar character are not apt to recur in the near future.

By whatever yardstick corporate liquidity is measured—liquid assets taken as percentages of current liabilities, total liabilities, or transactions—the ratios are now significantly lower than in comparable stages of other postwar business recoveries.

For example, liquid assets of manufacturing corporations were 58 percent of their current liabilities in March 1959 but only 45 percent of their current liabilities in March of this year. Thus, manufacturing liquidity fell by 23 percent between about the same stages of the 1958–59 and the current business recovery. Furthermore the abate-

ment of inflationary expectations among businessmen means that the interest cost of borrowing is not longer offset by the anticipation of higher prices.

Monetary policy also has indirect effects on business demand for inventories, as can be illustrated briefly. Through its effect on plant and equipment outlays, monetary policy may indirectly influence new orders for producers equipment and building materials and hence inventory investment in the industries which produce these goods. Similar influences spread out from changes in the availability of loanable funds for the financing of houses, autos, and other consumer durable goods.

To sum up, demand-and-supply effects in credit markets undoubtedly influence inventory investment contracyclically. On balance, the magnitude of these effects would seem to be significant and pervasive although moderate. The gradual narrowing of the spread between profits and interest rates, the fall in corporate liquidity and the higher level of interest rates in recent years suggest that in future periods of credit restraint, monetary policy may exert somewhat more restraint on inventory accumulation than during most of the postwar period.

My invitation to appear today specifically requested comments regarding the feasibility of introducing some form of direct control over bank lending for inventory purposes.

On the basis of the Board's experience with selective controls in the security, mortgage, and consumer credit areas, I am very skeptical of the desirability or practicality of credit controls directed specifically toward inventory investment.

One characteristic of credit—even of the most specialized type—stands out from our experience, that is, it is impossible to trace, except by the business decisionmaker. Who is to say whether borrowing to finance plant and equipment really finances that or a concomitant rise in inventories?

Aside from these general defects, a specific problem in any effort to exercise direct control over inventory lending would arise out of loans secured by or financing expansion of the borrowers' accounts receivable. Since the accounts receivable of a firm often finance the inventories of its customers, much inventory financing actually appears in balance sheets as accounts payable and accounts receivable.

Accounts receivable of nonfinancial corporations now stand at a higher level than inventories themselves, in terms of book value. Thus, financially strong businesses could obtain large amounts of new bank credit secured by their existing receivables, which then could be used to expand their receivables and thus to finance inventory expansion by their customers. And to the extent that other borrowers are denied bank credit by selective controls on inventory credit, the ultimate effect might well be to force additional financing along the accounts receivable route. Such a development does not seem desirable from the standpoint of maintaining and extending the competitiveness of the economy and curbing marketpower of dominant suppliers.

In short, there would be serious, and, in our judgment, probably insurmountable problems in any attempt to ration one specific use of credit by business. It would also be very difficult to avoid discrimination against those growing businesses which must rely on bank credit to a greater extent than established firms.

I realize that this discussion of direct, selective controls on inventory credit has not included any suggestions on how the difficulties mentioned might be overcome. But I seriously doubt that there is anything constructive to offer with respect to administrative controls of this type.

The problem remains, of course, of inventory fluctuations and their effects on the business cycle. Effective use of available tools of monetary policy can assist in moderating these swings, as likewise can appropriate fiscal and Federal procurement policies. Also helpful is the continuing development of accurate, detailed, and prompt statistics on inventories and related factors. These will enable individual businessmen to assess more accurately the output and inventory investment decisions of their customers and suppliers and hence help diminish destabilizing movements in their own output and inventories. The effort of your associated subcommittee on economic statistics has contributed importantly to this objective.

But by far the most important influence on inventory investment is the character of the economy and business expectations regarding the future course of events. Basically, our attention should be focused on means for shaping that character and these expectations in ways that encourage vigorous, stable, and sustainable patterns of economic growth. Continuing progress toward this objective should do much to moderate cyclical swings in anticipations and hence in inventory investment.

Representative REUSS. Thank you very much, Mr. Chairman.

I take it that what you are saying is that while inventory swings certainly do accentuate ups and downs of the economic cycle, it is, in your opinion, rather difficult to act on inventories directly; and the only certainties in this rather uncertain field are that the better and more accurate the statistics available to businessmen, the more accurate their inventory guesses will be, and the more they will avoid unnecessarily violent swings in inventories.

Second, you feel that to the extent the economy comes as close as possible to realizing the goals of the Employment Act of 1946—maximum growth, maximum production, maximum purchasing power, maximum employment—to that extent wide swings in inventories can also be avoided.

Would that be a fair statement of the two conclusions that you feel are really valid ones?

Mr. MARTIN. Yes; I think so.

I heard the phrase in 1957 and 1958 and again in 1960–61 of a "computer recession" being brought about by the fact that computers had gotten so good at assessing inventory around the country that there was less error in the judgments that businessmen had been making with respect to what their holdings should or should not be at a given time.

But I think the dominant point there was probably that the lessening of inflationary expectations, which had placed an emphasis on building of inventories because they expected to profit by an increase in the price at a later time, began to diminish from the 1957 period right through to today. So the combination of those two is very important and as you say, as we get closer to the full employment level, we have less disparity in these judgments.

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Representative REUSS. You made a very understandable case, I thought, against the use of selective controls on inventory loans, making the point that it would be extremely difficult to write such a regulation, administer it, and that it would certainly be extremely prejudicial against new businesses or businesses that rely heavily upon bank loans rather than internal sources for new financing.

Putting that aside for the moment, I am wondering if there are not situations where general monetary controls are a rather blunt instrument. Suppose a situation in some ways like that which ensued at the time of the Korean war, where there is a big inventory accumulation—everybody at all levels wants to get his hands on goods, whether it be sugar, a new suit of clothes, or producers' goods—let us assume that, at the same time, there is a lot of slack in the building industry; there the monetary policymaker would be confronted by somewhat of a dilemma, would he not, as you frequently are confronted by dilemmas in making overall monetary policy, because while you want to tighten money to discourage inventory accumulators, you would not want to chill off the building boom which, by our hypothesis, was long past due and where there is some excess capacity?

I realize it is difficult to comment on a hypothetical situation, but what about that? Or maybe you get at it the other way by some sort of Federal housing arrangements to help the building industry.

Can you get away from the meat-ax effect of monetary policy?

Mr. MARTIN. I think it is very difficult. You posed the question very fairly. In the Korean period we needed everything—general, selective, everything else—in the way of controls, because that was virtually a wartime operation.

Insofar as we were unable to meet the problem at that time, it was because we tended to ignore some aspect of the overall picture. Certainly under those conditions you need all the controls that you possibly can have. But I think when we are talking about an economy that is not a wartime economy or is not a buildup of that sort, it becomes increasingly difficult to discriminate between borrowers without penalizing many intelligent and competent borrowers in your society. You are making the judgment that they should be penalized in favor of someone in say the construction industry when it is not necessarily the right thing to do.

Then you get the go-around technique.

We have had some of that in the recent stock market operation. We had high margins, as you know, at 70 percent for quite a period of time, but none on unlisted securities and on nonpurpose loans. We have had repeated charges that credit has gone into the market through this vehicle. Now, we have been unable to trace it down, but we know that the high margins have unquestionably encouraged avoidance of the margins in other directions.

Representative REUSS. The New York Times had a big piece a few weeks ago suggesting that it was the nonpurpose loan which very largely percolated into the stock market. This is not relevant to this morning's discussion, but is the Fed now studying the use of nonpurpose loans?

Mr. MARTIN. We have been doing it for some time. We have studied that for a period of years. That is the point I am raising, which applies, I think, to this inventory problem too, as a parallel. We have an agreement signed with respect to nonpurpose loans in the

bank. It is perfectly normal that people will tend to be more lax, perhaps, in the administration of high margin requirements than they would with lower margin requirements, because the tendency to siphon credit in a particular direction gets more and more difficult.

We have found no specific instances of violations of this, but we know that there are areas outside of our enforcement authority. We have been working with the Securities and Exchange Commission on this for a long time. I would like to see loans on unlisted securities brought in.

Representative REUSS. You have, in response to my question of a moment ago, said that there are times such as in the Korean wartime economy, when you need every weapon at your command, and I am sure you do. However, in such a situation, can you conceive of a weapon which would be directed mainly at inventories? You have never had one. You have regulated housing credit, consumer credits, stock market credits, and maybe one or two other specialized forms of credit, but you have never tried in the past to get at inventory credit directly.

Mr. MARTIN. No; not directly. We once considered a capital issues committee or something of that sort, which is a part of the wartime mechanics. It is very difficult, as I tried to point out in this statement, to isolate exactly what is an inventory, particularly when a new business is starting out.

Representative REUSS. You might almost say that inventories are the least susceptible to direct controls. While you have your difficulties with listed securities and housing and consumer credit, at least you can get your hands on that. You are indicating that inventories are so Pickwickian that you have trouble drafting a regulation.

Mr. MARTIN. I think they are very, very difficult, and in November of 1955, when your associate subcommittee worked on this, we pointed out that this was one of the weaker areas of our statistics. I think the Commerce Department has improved its statistics considerably since that time. But still it is very difficult to define and to pinpoint exactly what inventories are.

Representative REUSS. Senator Pell?

Senator PELL. Just one question. On page 6 of your testimony, where you refer to the fact that you are skeptical of the desirability of credit controls because no one can tell whether borrowing to finance plant and equipment really finances that or whether it is to finance the rise in inventories.

I would seem to me that you have a selective control when you exercise margins in the stock market, changing the rate of margin or regulation, with regard to borrowing. I am wondering if you could not do the same thing here a bit.

Mr. MARTIN. Well, if we knew exactly what the inventory was, you see; that is the point.

Senator PELL. But in the industries, where you know the inventories are perhaps somewhat heavy, too full, you might exercise some selective control. Would that be difficult or not?

Mr. MARTIN. We have had great difficulty, Senator, in finding it. We sometimes know after the fact. You referred to selective control on margins. I have come to the conclusion myself, as I have stated a number of times, that it is a very difficult instrument to deal with

even there. Insofar as protecting the individual and the market from the sort of thing that happened in 1929, I think it has been successful. But insofar as preventing people from using other means to trade in securities and borrowing directly, I am not sure how successful it has been.

Senator PELL. When it comes to selective controls over lending for inventory purposes, I quite agree with you. Thank you.

Representative Reuss. Mrs. Griffiths?

Representative GRIFFITHS. Do you have any other examples of selective control that you think have worked effectively?

Mr. MARTIN. The only ones we have had, Mrs. Griffiths, are regulation X on real estate and regulation W on consumer credit, and the stock market regulation. I do confess that I am not very enthusiastic about any of them.

Representative GRIFFITHS. Do you think any one of them works any better than any other?

Mr. MARTIN. I think the stock margins work effectively insofar as preventing the sort of thing that happened in 1929, where someone borrowed on 10 percent margin and then was forced to dump the securities in a decline.

I do not mean that all of it was eliminated but I think if we had not regulated margins, the present stock decline would have been much more serious than it was. It was serious enough, but it would have been much more serious without margin requirements. So to that extent I think margin requirements have been very, very effective. very useful.

Representative GRIFFITHS. Well, again, if the market is due for another decline, what will be the result of a 50-percent margin—of lowering the margin?

Mr. MARTIN. Well, nobody can prevent a decline in prices by credit, but I think there will be that much more trading ability for adjustments in positions, and that is why I think it was desirable—we thought it was desirable—to take this opportunity, because we want to help equity financing in every way that we can.

Representative GRIFFITHS. What is your opinion of the control on real estate—credit controls on real estate?

Mr. MARTIN. Regulation X, when we had it, struck me more as a nominal device than anything very effective. We had such loose control on it in specifics. Do you remember, Jack, the terms on regulation X?

Mr. NOYES. Oh, the downpayments on smaller type units were never much above 10 percent—around 10 or 12 percent. It was a pretty liberal regulation in its tightest form.

Mr. MARTIN. That is the point I am trying to make, that we never really used real estate controls as a dampening effect, because everybody is for the homebuilder. Let's put it that way. Housing is like motherhood. We are all for it. Well, if you put a 10-percent margin on the purchase of a house, the tendency is always to lower it. The little adjustments upward have been very slight. So I have never thought it meant much as a control. I think it was better than nothing, and it may have influenced downpayments, but the lenders themselves would have insisted on some downpayments. you see.

Representative GRIFFITHS. In your judgment, is a control not practicable because it is not enforcible?

Mr. MARTIN. Well, I think that is one aspect of it. It is very difficult to police. We found that out on regulation W. Congress took that away from us; the Board did not recommend that that be taken away. But when it was taken away, we had something like 30 cases in the court at the time. It is a very difficult thing.

Representative GRIFFITHS. I personally agree with you that it would be practically impossible on inventory.

Mr. MARTIN. Very difficult.

Representative GRIFFITHS. Thank you very much, Mr. Chairman.

Representative REUSS. Mr. Chairman, in addition to the many specific trenchant observations you have made in your statement here on the question of inventories, you had some interesting things to say about monetary policy in general.

I am referring to quite an important statement you made this morning that, in your judgment, monetary policy is beginning to have some bite today, which it has not had for many years.

You cited two factors, the lessened liquidity of corporations generally and the fact that inflation is no longer regarded as just around the corner. Both of these factors make borrowers frivolous about borrowing money with the expectation of price increases in the ultimate product. Therefore, when you tighten or loosen money today, it is likely to have more immediate effects than has been true at any time before in the last 10 years. Is that a fair re-do of what you were saying on page 5?

Mr. MARTIN. In a general sense, that is true, and I think that has been progressively true since the end of the war period.

The heritage of every war is inflation and during the war period, we built up controls, and in the case of the Federal Reserve at one point, we had a pegged interest rate. There was no fluctuation in that at all, except on a nominal basis. Well, I think that was a very unfortunate situation that had to be at some point liquidated. In wartime you can do that, but as you get away from war, it gets progressively more difficult.

But one must remember that the economy is affected by a combination of fiscal policy, debt management policy, wage-cost policy, and monetary policy.

Representative REUSS. In the light of the improved efficacy of monetary policy that you have described, and in the light of the fact that our economy generally today, in July 1962, is one that is causing many people worry—that is to say, if one reads the papers, one hears it said in high places that we need a tax cut, maybe an immediate tax cut, to get things going—I am a little surprised that your net free reserves in the Federal Reserve System have in the last 6 weeks fallen rather markedly below the half-billion level, where they have been for the last year and a half. I note, for instance, that while this week, they are up above half a billion dollars, ever since May 30, with the exception of this week, they have been falling. The weekly figures which I have in front of me are $440 million for May 30; $436 million for June 6; $365 million for the week ending June 13; $346 million for the week ending June 20; $306 million for the week ending June 27, and $419 million for the week ending July 4.

Similarly, during this same period, interest rates on both 90-day bills and Government bonds over 10 years, as well as Federal funds, have gone up rather consistently.

I am just wondering if you care to comment on that recent pattern in free reserves and interest rates. I should have thought, frankly, that the free reserve level would have been kept at about half a billion dollars rather consistently, and that effort would have been made to keep interest rates from rising in a period when the country is worried about sustaining its recovery and talking about fiscal imbalancing via less taxing and more spending.

Mr. MARTIN. I think most of you are familiar with my views on this free reserve figure. I get critical of the desk in New York myself sometimes, and I think I could sit down there and do it better than they do, but it is a very difficult thing to make these projections. The feel, the tone of the market—all of those things have to be taken into account. Now, we sit around the table every 3 weeks in our Open Market Committee and we have 19 people that give their estimate of what ought to be done in this. Then the manager of the account has to pull that together and try to work out a pattern from it.

Let me give you an example here recently. Take the free reserve figure of 521 reported this morning. In my judgment credit is actually tighter in the market—this is a matter of degree—than it was at 300. But that is a matter of my judgment. Your judgment might be different. But that is the type of thing. Now, why did it get to 521 this week? In large measure because the Fourth of July came in the middle of the week and measuring float over such a period with an airline strike to boot is an almost impossible thing to do.

Now, on the broad subject of policy, we try to supply the reserves we think are adequate for the economy and also in terms of the general economic situation.

That is what we do every 3 weeks. That is our job. But I certainly would not pay much attention to the free reserve figures as such. It is only one of the factors.

Representative REUSS. I do not mean to suggest that I am wedded to that, and I realize that for particular weeks, it can be most illusory as a guide to the credit situation in the country. However, it is one of the indicators, and to me it is one of the more meaningful ones when it is accompanied by a steady rise in the interest rate—for example, interest rates on Governments over 10 years as of June 2, 6 weeks ago, were 3.89. In successive weeks, they went to 3.88, 3.87, 3.90, 3.95, 3.99, and presently 4.02.

The 90-day bill rate, starting June 2, was 2.65, 2.69, 2.67, 2.72, 2.79, 2.93, and 2.97, going up rather steadily.

What I am concerned about is that here we have a situation in which admittedly, and I think this is a good thing, monetary policy is finally acquiring some bite. It is a more meaningful tool than it has been. Then we find interest rates, both at short term and long term, going up rather steadily week after week in the last 6 weeks, and net free reserves sinking well below the half billion dollar mark, all at a time when the general tenor of national economic thought, if one reads the newspapers, is that our employment growth position is not satisfactory. I, therefore, question whether this increase in interest rates is a good thing for the economy, and if it is not, whether credit ought not to stay easy.

Mr. MARTIN. That is the problem we have at each Open Market Committee meeting, Mr. Reuss, and it is a very real one. I want simply to point out to you that over the past year, there have been a number of times when these rates that you have given in the 6-week span have been up and down slightly.

I think one of the significant things is loan demand, which is very difficult to project. I have made my own projection quarter by quarter on loan demand and I think it is fair to say that the expectations of the bankers through the last year or 15 months has not been reached at any time, in many areas of the country. There are different areas of the country, but as a whole, the demand for loans has not come up to the expectations of the loan officers and the bankers in the institutions. That has been one of the factors in the market. But I am just pointing that out.

A year ago at this time, roughly, I was up before a committee here talking about this problem. At that time, it looked like we were going to get quite a surge in loan demand. By September, it was apparent that it did not develop.

But on the matter of interest rates while we are talking about that here, I think we ought to bear in mind the point that I think you are very familiar with, that we also have a balance-of-payments problem here and we cannot afford to completely ignore the interest differentials in this country and the rest of the free world.

That is a matter that gives us concern also that we have to watch all the time and that we are constantly working on. That is one of the factors that comes into our consideration.

Representative REUSS. Well, I know it does, and I have wondered many times whether we are really better off diluting our goal of domestic maximum employment and growth by imagined or even real short-term balance of payments considerations. Many of us do not regard it as a calamity if short-term bank accounts choose to nestle down in Zurich or London or Frankfurt rather than in London or New York. We wonder, as I am now wondering out loud, if the economy would not be stronger if we would hew to our central goal of providing maximum employment and growth.

From what you say, I am wondering whether these interest rates—and I refer both to the short-term 90-day rate and the over-10-year long-term rate which have gone up week after week almost without cessation in the last 6 weeks—are not higher than they would be if there were no so-called balance of payments considerations in your mind and in the minds of your colleagues in the Board of Governors.

Mr. MARTIN. I cannot speculate on that. All I can say is that I do not believe it is possible to separate the domestic problem and the balance of payments problem.

I think they are one and the same problem in the current setting, and I think that the administration is bending its best efforts, and I know the Federal Reserve is helping in every way we can to deal with this balance of payments problem. At the same time, we are doing our level best to help the economy.

Now, it is a matter of judgment always as to what is the best and most effective way to help the economy.

I personally do not think you can separate the balance of payments and the domestic economy at this juncture.

Representative REUSS. Certainly I am all for what you have been doing in the last 18 months, wherein you concentrated your efforts to secure higher interest rates in the short end of the market and did your best consistent with that to tip the teeter-totter so that long term interest rates were kept low. I am not suggesting that we should throw balance of payments and interest policy out the window.

I am suggesting that when you have done what you can to skew short-term interest rates higher and long-term interest rates lower for balance of payments considerations, the question is how far up the whole interest rate structure should be pushed for balance of payments reasons.

I am pointing out that it looks to me as if our interest rate performance, at least of the last 6 weeks, has been dictated by balance of payments considerations at the expense of domestic growth considerations.

As I understand your position, you fully and frankly concede this and say this is what you have to do.

Mr. MARTIN. I say this is one of the factors in the current situation with respect to how to promote this growth. That is where the element of judgment comes in here. I think that the 19 men who are sitting around the table have to take this into account at every meeting.

But I can assure you that their purpose is to achieve this same growth and improvement in employment, and you and I are in complete agreement on that. So are they.

Representative REUSS. Of course, we have now before us in the Banking and Currency Committee in the House a bill which I believe you support—you are going to be before us on it next Tuesday—which would permit the payment of higher interest rates by American banking interests to foreign trade on their money on deposit here.

If this should become law, this would give you a little more elbow-room, would it not, to have a monetary policy more exactly attuned to domestic needs and not so much influenced by the contrary pull of balance-of-payments considerations?

Mr. MARTIN. I think that bill in a very small way would be helpful. I do not think it is going to be of any particular significance. I support the bill, but I do not think it is going to solve the balance-of-payments problem.

Representative GRIFFITHS. Are you saying that lower long-term interest rates adversely affect the balance of payments? Are you saying that?

Mr. MARTIN. No. I am saying that the interest rate differentials, Mrs. Griffiths, between this country and foreign countries naturally have to be taken into consideration, because since we have convertible currencies the whole world is the area of investment.

Naturally, people who have funds to invest are going to select the area where they can get the best return.

Representative GRIFFITHS. And would lower interest rates here encourage borrowing in this country by other economies?

Mr. MARTIN. Yes, indeed; and they have in some instances. The Japanese borrowed here heavily late last year. A number of foreign countries have.

Representative GRIFFITHS. Thank you.

Representative REUSS. Dr. Darling, I think you may want to pursue with Chairman Martin one or two of the more technical points raised on inventories.

Mr. DARLING. Thank you, Mr. Chairman.

Chairman MARTIN, you have said in your prepared statement that inventory investment, if I understood you correctly, reflects primarily two basic aspects of business activity—first that inventory investment is a reflection of the movement of final demand in the economy. You mentioned both orders and sales, for example. And second, that it may at times reflect supply conditions, meaning that when delivery periods are rapidly expanding and so on, business firms will find an incentive, perhaps, to build up stocks as a protection against runouts.

If this is so, is the rate of inventory investment more than a mere component of GNP? Can it be looked on as reflecting the direction of movement and to some degree the rate of change of movement of the economy or business activity? I am asking for your assistance in our understanding of this.

Mr. MARTIN. I will ask Mr. Noyes to comment on it. This is a very difficult area to comment on. It is a matter of degree.

Mr. NOYES. I would not attempt to talk in this area beyond the Chairman's statement. I could not improve on your judgment on this in any way. I have followed this problem to some extent in the course of my work, but not nearly as intensively as you and many others, who have focused your attention on this phase.

Mr. DARLING. It was not my intention to ask you to do that. It was only to get your feeling on this problem.

Mr. NOYES. I would refer back to the statement that the Chairman made, which was quite accurate, that perhaps the expectational aspects deserved more attention, and perhaps expectations rather than current sales play a very large part in shaping policy. As was mentioned in the Chairman's statement, this whole problem of determining what the decisionmaking process in the inventory area is is one of the most troublesome problems.

We have tried to understand it but have had very little success, frankly, to understand what is the factor that causes a businessman to shift his inventory policy at a particular stage from one of rapid accumulation or less rapid accumulation or perhaps even decumulation.

Mr. DARLING. May I ask just one other question here?

Is the timing of Federal Reserve changes in credit availability over the course of what I shall call the business cycle, is this responsive—has it been responsive during the postwar period to the needs of influencing inventory holdings? Now, by that question, I mean this: Although this is somewhat difficult to see, chart 2 over there shows inventory investment in the lower panel and final sales in the upper panel, and it can be seen that they do not move with respect to peaks and troughs simultaneously. (Reference is to chart 2 above, p. 21.)

So my question is, to the extent that inventory investment is considered to be a substantial part of the changes that occur in GNP, and a substantial contributor to that change, has the timing of Federal Reserve policy changes been responsive to the needs for offsetting shifts in inventory investment or has it been directed more at the changes in final demand?

Mr. NOYES. Well, I cannot answer the question, obviously, specifically, because as the chairman has just said, monetary policy is formulated by 19 men, really, and you have to read their minds to determine to some extent what determined the timing and direction of the changes made in policy. It is almost impossible to say how much they were influenced in their judgments by all of the statistics and all of the information which was reported to them.

I think all that I can say that would be responsive to that is that inventory change and our judgments as to the inventory policies which lie behind current changes in inventories have always been a very important part of the economic information which has been reported to the policymakers and that I would assume, therefore, that it has played some part and perhaps an important part in their decisions. But as I say, to give you a specific answer to your question, I would have to be able to read the minds of the 19 men who assess the economic situation and report it to you.

Mr. MARTIN. I can speak for one of those 19 men by saying that this has not been as significant an item, in my reactions on monetary policy as has been loan demand and the relationship of that loan demand to inventories.

Now, when we have a period like a strike coming on and there has been a big buildup in inventories as a result of that, inventory accumulation may be more important in your mind than it would be under different circumstances.

Mr. DARLING. One question with respect to the possibility of selective controls in spite of the many difficulties that are clearly apparent. I believe Chairman Martin stated that the bank component behind inventory investment can at times be strategic, if I understand your statement correctly, and I wanted to know whether this does not reenforce a case for selective controls. Furthermore, with respect to one of the great difficulties that was mentioned, namely, the discrimination that may occur with respect to different types of firms and for new small firms, growing firms, in comparison with others, would it not be possible in the design of a selective control to make allowance for some normal relationship of inventories to production and sales within particular industries or with respect to size and so avoid or possibly lessen one of the grave difficulties in designing a selective control?

Mr. MARTIN. Yes; I think that is a reasonable area of exploration. It is not easy to do, however, even there. I discussed this with a friend of mine who ran one of the department stores for a time, in an effort to develop some such component in his particular store, and I was amazed at the variations that occurred right there. Now, you have had more experience than I have in this area, but I think that is one of the really sound approaches if you are going to use this as a selective control.

I think it is probably the most fruitful, really.

Mr. DARLING. Thank you.

Representative REUSS. Let me ask you a question, Dr. Darling. I am impressed by what Chairman Martin said in his prepared statement about the need for accurate, detailed, and prompt statistics on inventories in order to enable individual businessmen to make sound decisions and thus diminish the destablizing effect of inventory movements. My question to you is this: Either in this study by this sub-

committee of the Joint Economic Committee or in any studies of the Subcommittee on Economic Statistics, whose chairman, Senator Proxmire, is here, have we asked the Federal Reserve System to make suggestions on the kinds of improvement and statistics which are necessary?

Mr. DARLING. I would answer by saying that the Federal Reserve was the most important element in a study that was made in, I believe, 1955 on the question of inventory statistics, that the benefits from that report had accrued to us by helping Dr. Elmer Bratt, who prepared a followup study which has been prepared in our series on inventory fluctuations in part 3 of our technical studies and hence has been very helpful.

Representative REUSS. What I am getting at is, have we asked the Federal Reserve System whether they have any post-1955 thoughts on how to improve economic statistics as they relate to inventories, and if we have not, should we not, so that when we prepare our recommendations as a result of this inquiry, we can have the benefit of the thinking, or did Dr. Bratt get those?

Mr. DARLING. It may very well be that the Office of Statistical Standards prepared this information for the study.

Mr. NOYES. I believe there have been informal conferences for that purpose on the staff level.

We have talked with Dr. Bratt and provided some information to the Office of Statistical Standards on the staff level.

Representative REUSS. Then this problem has been given to consultants?

Mr.NOYES. I think it has reached them indirectly through the Office of Statistical Standards.

Representative REUSS. Senator Proxmire?

Senator PROXMIRE. I would like to ask Chairman Martin, in your statement you say "The gradual narrowing of the spread between profits and interest rates, the fall in corporate liquidity and the higher level of interest rate in recent years suggest that in future periods of credit restraint, monetary policy may exert somewhat more restraint on inventory accumulation than during most of the postwar period."

On the basis of the testimony we had the day before yesterday, when Dr. Duesenberry and Dr. Stanback, and Dr. Mack and an expert from Sears, Roebuck were here, the testimony indicated that monetary restraint has had very little influence on inventory accumulation during the postwar period.

They said the cost of carrrying inventory is 30 or 40 percent, depending on the kind of inventory you are talking about, but the cost is so much higher than interest, that interest is not a particularly significant factor in the decision on size and timing of inventories.

They did say credit rationing might be important but the borrowing that is usually most available to business is borrowing on inventory. The collateral is obvious. It is broadly liquid. There is seasonal experience. So that the impact on monetary policy of interest rates is normally pretty minimal; is that right?

Mr. MARTIN. I think that is right.

Senator PROXMIRE. So the greater influence will still be quite moderate and quite small.

Mr. MARTIN. I think that is right.

Senator PROXMIRE. In view of that situation, it would seem to me that the international payments argument, in other words, that you are going to aggravate the international payments adverse balance by providing incentive for investing abroad as compared with investing here, that that also is a very small consideration, in view of what you said last year, when you were before us last February, I should say, when you said:

> Restraining these capital outflows is particularly difficult because they represent various normal kinds of lending and investing. These outflows reflect the ready availability of credit in U.S. markets. Only in part can they be influenced by the level of short-term interest rates. By and large, such differences as did develop last year between money rates here and abroad do not appear to have been a primary determinant of capital movement either from or to the United States.

I construe that as meaning that monetary policy again was not the prime determinant or the principal reason for the movement of capital between this country and abroad. Is that correct?

Mr. MARTIN. Well, at that particular time that I was testifying, it seemed to me that it had not been a significant factor, but it is something that we have to be alert to all the time.

Senator PROXMIRE. I understand.

Mr. MARTIN. The spread at that particular time between London and New York, for example, on an uncovered basis, was minimal. It got it up later to nearly a half of 1 percent.

Now it is down fairly low again. But at the same time we are in a very difficult period, as you know.

Senator PROXMIRE. The reason I am pursuing this line of questioning is that it seems to make more and more sense to increase short-term interest rates which will have a minimal effect on expansion of inventory borrowing. You can thereby create beneficial effects on the capital movements. But at the same time, to get the economy moving, you can do whatever the Federal Reserve can do—and I admit it is limited—to reduce the rates on long-term obligations.

Mr. MARTIN. Yes. The so-called Operation Nudge has about played itself out, in my judgment.

Senator PROXMIRE. It is awfully hard to find the statistics to suggest that the Federal Reserve has been very aggressive in this respect.

Mr. MARTIN. It is purely a matter of judgment, Senator. I think we have been very aggressive.

Senator PROXMIRE. Well, as we look at the record of Fed bonds, holdings in January, 3.8 billion; in May, 3.7 billion; July, 3.8 billion.

It looks like there is not much of an effort to increase that portfolio.

Mr. MARTIN. Consistent with the offerings that have come into the market, I think we have done an extremely competent job. I am talking about the desk at New York. They would be delighted to have you go up there sometime if you have a little time and see what the flow of these securities is.

You see, people have an idea that long-term securities, in a country as large as this have the same sort of market that bills have and they do not. Here is a fellow holding some in a trust account in St. Louis, another fellow has some in a trust account in Oregon. The original reason for purchasing long-term bonds is not to trade in the market anyhow. Now there is a little fluctuation, suddenly the desk wants to acquire some; how are you going to open up this market?

If you want to talk about sterilizing the long-term assets of the Government by having the Federal Reserve just buy blocks from the Treasury of long-term securities, that is another story. I personally am against it. But I am talking about the approach to the short and long market. I think that the Fed has done an extremely good job of dealing with the market as it is. We cannot make that market or control that market.

I do not think that you can put it in terms of the statistics of securities required. The fellow up there operating today on the trading desk has to sit there and look at what is coming into the market.

It is a mistake to think he can just bid up a half of 1 percent and get securities to come floating in there. I have gone up there three times in the last month myself and been perfectly fascinated by the inability to really gage what this overall market is. Yet I think we pull it together in a very reasonable way.

Senator PROXMIRE. But the facts are that interest rates have been rising on all maturities, whether they are Federal, State, local, or private, within the last 6 weeks or so.

Mr. MARTIN. They have tended that way. That was true a year ago at this time also.

Senator PROXMIRE. This has been at the very time when the AFL–CIO, the chamber of commerce, the Governors, many politicians, the President of the United States, are saying that the economy is sluggish, unemployment has remained at 5½ percent for 6 months, and they are so concerned about the situation that although we face a deficit in the coming year, they want a $7½ billion tax cut and bigger deficit to stimulate the economy.

It seems to me if we are going to keep interest rates high and rising we are following a monetary policy that slows down borrowing, building expanding exacty when everybody says we should cut loose and really cut loose the fiscal machinery. If we give the economy a fiscal stimulus just when we put on the credit brakes the result may be a standoff—it may be that monetary policy is going to win and the economy slows down. It may be that the fiscal policy is going to win and the economy move ahead faster. We do know we are going to get a big deficit, high interest rates, and at best a brake on expansion. This does not make any sense to me at all.

Mr. MARTIN. The problem you are describing, as I said to Mr. Reuss earlier, is the problem the Open Market Committee deals with every 3 weeks. We sit down, 19 of us, and evaluate just the factors you are describing and determine what is the best and most effective way for us to promote growth and help the economy. It is a difficult judgment. That is really all I can contribute on it.

Senator PROXMIRE. But with the Constitution so clear in giving the Government the authority to coin money and regulate the value thereof, giving Congress that authority, and Congress having delegated that authority in article 1, section 8 of the Constitution, to the Federal Reserve—you have the power to regulate money—you are in a splendid position to do this job. It seems to me so frustrating that interest rates which should be within the very clear purview of Government, which have been used so traditionally and frequently, again and again to stimulate or restrain the economy, that under circumstances like the present, where there is such a consesnus that we should take the fiscal steps which have real penalties, as well as possibly some benefits, that we have this credit restraint.

I just cannot understand why the Federal Reserve seems to be so impotent now.

Mr. MARTIN. I think you cannot separate the balance of payments and the promotion of growth and development in the domestic economy.

We have gone through a long period since the end of World War II. The heritage of all wars is inflation. We struggled with that for a long period of time and we were able by deficit financing and other devices, more or less, to minimize recessions through the period. But as I said to Mr. Reuss earlier, we had a big Government securities market up to 1951. Then monetary policy was virtually out of business.

Now, since that time, we have had to deal with all of these factors in the best way that we can, but we are now facing the situation where it would be irresponsible on our part to throttle the economy by so-called tight money—and I want to emphasize, Senator, because I think this is terribly important—if you are following an easy money policy and you get a little bit less easy, it does not mean you are making a tight money policy.

Senator PROXMIRE. Well, interest rates are going up. That is the easiest.

Mr. MARTIN. The point I am trying to make is if you are following an easy policy and you slightly diminish that ease—because as I have used the illustration of the stream, the water in the stream is now overflowing the banks on either side and you think it is not doing any good—that does not mean that you have restricted the flow in the stream.

Senator PROXMIRE. Let me give you an example of what really concerns me very deeply. Say we have a $6 billion tax cut concentrated in the personal sector. This would be about a 3-percentage point drop—20 to 17 percent in the bottom tax bracket.

This would mean that the average man with $100 income would get $1.30 more per week or $6.50 per month to spend. On the other hand, if we have a 1-percent cut in interest rates, the same man buying a $20,000 house would find that his monthly payments would be reduced $8.

Now, with a $1.30 increase in his weekly pay check, even though that is a substantial cut—a $6 billion cut—he would be not very likely to go out and buy a house. But with an $8 cut in his monthly payments on his home under these circumstances, it seems to me we could stimulate the area of our economy which is in most serious trouble, from the standpoint of employment. Unemployment in construction is most serious. We have been in the doldrums in homebuilding for 12 years. So if we are going to follow a fiscal policy of cutting taxes to try to stimulate the economy and get it moving and provide more employment, I can see how it is going to be clearly frustrated by high interest rates.

Also, in terms of social priorities. We need homes, schools, hospitals. These high interest rates frustrate right along the line the building of the things we most urgently need in our economy and particularly in putting to work people who most urgently need work.

Mr. MARTIN. Senator, you and I are in agreement on what we are trying to accomplish. I think that no one would assert today that there is any lack of mortgage funds. There has been a tendency for mortgage rates to decline for the last 6 months.

Now, there has been some improvement in housing starts, but the real thing that you are trying to do here is to see that there is an adequate flow of money to the economy and not such a large flow of money that it will either slop over the banks of the river, in my picture, and do no good, or encourage foreigners at this particular time to borrow unduly in this market, because banks and institutions do not have sound opportunities here to use the funds that they want to lend at the present time.

Now, when you get into the tax area, I do not think I ought to be commenting on that. That is not my area and I have my own ideas on it, but I think the Federal Reserve should be a nonpolitical agency.

Senator PROXMIRE. I understand. You see, the difficulty is this: I can foresee the very strong probability of a tax cut. President Kennedy says he is going to recommend it next year and he may this year. If we have that kind of tax cut—and I am against it, either this year or next year—I think it is a mistake. But if we have that tax cut, I assume its whole purpose is to get us moving and solve unemployment.

If you feel the situation is such that at the present time we could follow a monetary policy to increase interest rates somewhat, or has that consequence, certainly with the stimulus of a $6 billion tax cut, with a resultant increase in the gross national product of $12 billion, then you would have to follow a policy that would be a little more restrictive if you want to maintain the same restraint, same protection, against inflation.

Under these circumstances, what would be the real, ultimate, effect, the total consequence of Government action with the President and the Congress asking for a tax cut and the Federal Reserve at the same time applying the credit brakes? Because the way you look at it, you have to tighten credit to protect against price increase. Isn't the result likely to be, as I say, that we do not go anywhere?

Mr. MARTIN. I think there is a danger in that, but I think, talking for the Federal Reserve here, that our problem is that whatever deficit develops, even with the current tax, we should endeavor to finance outside the banking system.

We should try to draw the bona fide savings of people into this debt, and that has been our objective right along. I say in a period of expansion, for example, that the primary rule of a central bank is to minimize the substitution of bank credit for savings.

Senator PROXMIRE. Certainly, in a period of expansion, it would seem to me the usual fiscal policy has been to try to work toward a balanced budget and try to do our best not to have a deficit.

Now, where we have a situation, however, which I think is unparalleled—do you recall any situation in the Nation's history where we have had a tax cut and a deficit under circumstances where gross national product has been expanding rapidly and where the Governors of the Federal Reserve Board feel it is necessary to exercise some restraint?

Would this not be almost unprecedented?

Mr. MARTIN. I really would not——

Senator PROXMIRE. I am not talking about the theoretical situation. Business Week, a number of the outstanding financial commentators in the country, feel this is exactly what is bound to happen.

Mr. MARTIN. I cannot make any statement on that, but you can rest assured that the Federal Reserve is going to try to supply all the reserves to the economy that they can and also is going to see to it that the deficit, whatever deficit there is, is financed in a way that will not create bank credit out of nothing.

Now, to use the loose phrase, we do not want the printing press in the picture, because that would be disastrous.

Senator PROXMIRE. Let me ask you one more question very quickly. If we recognize that since the vault cash bill, which passed the Congress last year permits the banks to count till cash as reserves, wouldn't you feel that to have $500 million of free reserves is comparatively tight as compared with $500 million of free reserves before the Vault Cash Act was passed?

Mr. MARTIN. I do not think we want to take the free reserve figure too seriously. As I said earlier in this hearing, it has gotten blown up into a measure of ease or lack of ease in the economy which I think is unwarranted, because, after all, people have to try to draw some conclusions.

As I pointed out earlier to Mr. Reuss, I think the figure of 521, which is largely due to the fact of float and the Fourth of July holiday that we report this week, is actually firmer in the money market than the 306 figure—346 figure revised—we reported a few weeks ago.

Your basic point on vault cash, I believe, is that there is slightly less ease in a given level of free reserves now that vault cash may be counted than there was before we made that change in the requirements.

Senator PROXMIRE. During much of the year, virtually all the free reserves were in the country banks where it would count most.

Mr. MARTIN. We have watched that, and I agree with you, there is slightly less of an impact of free reserves in this situation. But our measurements have not convinced us that it is substantially less. However, it is a factor that we have to bear in mind in making our judgment as to what the level of reserves should be. We take that into account.

Senator PROXMIRE. Thank you, Mr. Chairman.

Representative REUSS. I hope you understand, Mr. Chairman, that there is no collusion between my colleague, Senator Proxmire, and myself. We happen to have asked the same questions, but we appeared at different times and we are simply two country boys from Wisconsin who cannot quite understand why everybody in high authority is talking about unbalanced budgets that would make former Secretary Humphrey's hair really curl, and large slashes in the income tax at a time when the bill rate from June 7 to the present date has gone up more than 10 percent. I won't quarrel about imagery and your river with its little swamp along the sides, but I am bound to say that as far as I can see, the amount of water in the streambed does have something to do with the interest rate, and the other action by the Fed and the action in fact taken could, I believe, have kept the interest rate at what it was on June 2, which is about 10 percent less than it is today.

That brings me to the one final question I would have to ask: You have said, as I say, very frankly and fully and fairly, as is your wont, that one of the reasons for this diminution in the ease of money, as you call it, one of the reasons for this pullback in monetary ease of recent weeks, is because of the balance-of-payments situation.

Now, I would like to have you tell me, Mr. Chairman, exactly what would have happened if, instead of allowing the short-term interest rate to increase by more than 10 percent in the last 6 weeks, you had taken such steps as were necessary by open market operations to keep it firm at 2.6 instead of allowing it to rise to 2.97.

Describe the process whereby bank accounts, holdings of U.S. Treasury securities get liquidated here, how they go abroad to London, Zurich, Basel, or wherever, how they get transferred to foreign central banks or treasury institutions, and finally, why this process really presents a danger to this country, particularly in view of the strides that have been made in central bank cooperation, in mitigating the effects of short-term capital movements, and particularly in the light of the recent approval by both the Senate and the House of the $6 billion standby credit agreement.

I should think that we have done what is needed to insulate ourselves against the right of holders of capital to seek the markets paying the highest interest rates.

I am rather appalled at the thought that we should sit still for a rate of unemployment and for a lag in growth in this country which are not only bad in and of themselves, but which cause learned authority to be talking in the newspapers every day about big tax cuts.

Would you walk me through this labyrinth? I cannot really see why the 90-day bill rate cannot be kept lower without untoward effects.

Mr. MARTIN. Mr. Reuss, If I could tell you what would have happened if the rate had been 2.6 instead of 2.9, I would be a magician. It just is not that type of problem. I simply know that the spread between New York and London, for example, to take two money centers, and they are not completely comparable, has narrowed recently in our favor instead of against us. It still is in favor of London but it is less.

Now, part of the factors in economics are always psychological and expectational. They are never precise and mathematical. Part of the problem we have been dealing with here is the flow of funds. I believe the administration has made remarkably sound strides recently, particularly in getting these prepayments from abroad. I believe the balance-of-payments figures for the second quarter have made a definite improvement. I think that the work that Secretary McNamara and the Defense Department have done on procurement has improved the situation substantially. But I am convinced that the Federal Reserve, for example, would be irresponsible, with the talk that is going on around the world and the attention that is being directed at the dollar, if we just assumed that we could ignore interest rate differentials between the United States and foreign countries.

We have fluid money markets in one degree or another around the world. We have an upset world. And I think that foreigners are looking very carefully at the way we are handling our situation, and I want to say to you, as I have openly, that we have to consider this and also that whatever deficit develops—and I am not talking about a deficit from the tax cut now; I am talking about the deficit we are running at the present time—that our financing of that deficit should be done through nonbank investors in large measure.

It cannot all be done precisely that way; the banking system is used in part. But that is the sort of financial responsibility that the

world is expecting from us today and I am sure that is what the Federal Reserve is doing because I think this will help the unemployment situation and will help the business picture and nothing else will.

Representative REUSS. You have given me two facets of Federal Reserve responsibility. The second one is that you want to do everything in your power to see that any deficit financing that has to be done will be done outside the banking system, through real savings rather than by the essential fiat operation of bank financing.

I could not agree with you more. I applaud your responsibility and I am right in back of you.

The other kind of responsibility, though, the responsibility to keep bank accounts and foreign money here in the United States seems to me rather a mixed-up one. I was over in Europe last week, and I talked to people from 40 different countries. They were not all Europeans, but they were from all the free countries of the world. Without exception the thing they were asking was, "Why does not the United States get into high gear and go on forward into a more adequate growth rate, so that we can really have confidence in the dollar?"

It seems to me we are in somewhat of a dilemma here. I should think the best thing we can do to firm up worldwide confidence in the dollar is to have an economy characterized by maximum growth and maximum employment. This, I think, would cause a great rise in the respect in which we are held in quite sophisticated European banking circles.

But as long as we give such a high priority to luring short-term capital here by letting our interest rate go up, I think we work against this objective, and therefore, I return to my question. What would have been so terrible, about leaving the short-term interest rate at 2.6, as it was on June 2? If somebody wants to sell U.S. Treasury bills and buy British consuls, or if somebody wants to close out his account at the Chase in New York and plunk it down in Zurich, let him. How is that going to hurt us?

If he then goes to his foreign central bank and demands dollars, let the foreign central bankers hold those dollars until the investment situation changes and some of the money comes back.

What I am getting at is that it seems to me we are pursuing two inconsistent objectives here. You cannot really mix them. You cannot really be for reasonable interest rates for domestic expansion and for high interest rates to keep the money from going overseas at one and the same time. It comes once to every nation and man to decide. I think we have to get at this and find other ways of guarding against money that goes abroad.

Mr. MARTIN. I would return to my basic point, that you and I are seeking the same goals here. I believe that if we can get maximum growth and maximum employment, we will have maximum purchasing power along with it at this juncture.

I believe that the road that we have to pursue to do that is, first, we must not finance this deficit through the banking system.

Representative REUSS. Amen.

Mr. MARTIN. And, secondly, we have to realize that this balance-of-payments problem—although we are now making some progress on it—is a very, very serious problem. It is very easy to see ghosts in this sort of a problem, but, nevertheless, these flows of capital around

the world are placing a real strain on the former impregnability of the dollar.

President Kennedy has declared that he was not going to devalue the dollar and not going to change the price of gold, and I think we have to realize that, in order to get these objectives that you are talking about, we cannot separate these two. I do not see the inconsistency that you do in it, because I believe they work together. Let me say, we did not set the rate from 2.6 to 2.9. We influenced the market to some degree, but these flows are more basic than that. Capital flows are the big item that we have to worry about now in the balance of payments.

Representative REUSS. We have been through many times whether you set the rate or not, but certainly, you, in your own testimony this morning, have indicated fully and fairly and frankly that you have tightened things up or de-unloosened things a bit.

Mr. MARTIN. No; no; I have indicated in my testimony that we have this problem in mind and that I would not tend to pay too much attention to these free reserve figures as such, but that in any event, we are following an easy money policy even if it is less easy than it was. But this is not something that is irrevocable at this time. We have not changed the discount rate, which would be a basic fundamental move that would attract worldwide attention. But we have been watching this flow, and I say quite openly that I believe we would be irresponsible as a central bank, and we would demonstrate to the world that we were unaware of our responsibilities, if we were not taking this into account at the present time.

Representative REUSS. Well, neither Senator Proxmire nor I suggest that you ignore the balance of payments.

What we are suggesting is that it seems to get into the saddle and ride things. We believe it would be much better if we pursued a primary policy of expanding business and employment at home, using a variety of other methods to insulate a low-interest-rate policy at home and to prevent it from causing unpleasant balance of payments or gold outflow results. One suggestion now before the Banking and Currency Committee is to permit the payment of somewhat higher interest rates on foreign accounts without distorting the whole domestic interest rate structure. Another is the vigorous use of central bank cooperation, a field in which I commend you for what you have done the last couple of years. Even in the event hundreds of millions of dollars go out of this country because they got slightly higher interest rates abroad, why do we not use International Monetary Fund credits to prevent gold outflow?

Mr. MARTIN. I do not think that course of action would work, but that is a matter of judgment again. Let me point out that when you say hundreds of millions of dollars go out of this country and we ignore it, that is of importance to investment in this country, too.

Now, there is no question that the United States has become less attractive in the last couple of years for investment because of the profit squeeze in some businesses here. That is a matter that concerns us also, because investment creates jobs in this country.

What I want to do is get the climate back that will give us more jobs and make this employment possible.

Now, the Federal Reserve is devoting its entire energy to help this problem, and even though you may think some of our moves are inconsistent with that, our goal is exactly the same as yours.

Representative REUSS. I am sure it is and I will just conclude this colloquy by saying that no matter how you slice it, when you raise interest rates or allow interest rates to go up in order to keep capital from going abroad for balance-of-payments reasons, you do, by the same token, retard reemployment of the unemployed and retard maximum growth here. I do not think anyone disputes the fact that the higher the interest rate the less likely are businessmen to invest and public and private agencies to invest, and this slows up production.

So you make a value judgment that it is more important to pursue balance-of-payments considerations than to go all out for maximum growth at home, don't you?

Mr. MARTIN. I do not really think so. Let me just say again that you have added a very good picture to my word picture of the river when you said the swamp. I talked about water overflowing the river, and you said the swamp on either side. That is a matter of judgment as to the swamp, but it is the swamp we want to avoid, because I do not think you are going to reemploy these people and get this economy going into high gear if we have a swamp alongside the river. Now, how we achieve this is a real problem. But I liked your adding the swamp on to my picture.

Representative REUSS. Well, I will reconsider the swamp.

Senator PROXMIRE. I would just like to ask a couple of things.

Let me follow up what Congressman Reuss was asking. Are you completely opposed to consideration of exchange controls? In view of the fact that there are relatively few people—a few hundred; maybe a couple of thousand people—involved in this kind of arbitrage of investing abroad or moving capital abroad if interest rates are higher to take advantage of higher rates, in view of the fact that there are 4 million unemployed who, in my judgment at least, may suffer from the policy of high-interest rates to stem these capital movements and safeguard our balance of payments—what would be wrong with doing what every other country in the world has done, as I understand, except maybe Switzerland, of providing for exchange controls and providing for a limitation in the investment of capital abroad, in this way?

Mr. MARTIN. I think it would do us more harm than good, Senator. That, again, is a matter of judgment, because I do not believe we are going to be successful in bottling this up by exchange controls. I think we have been the leader in the world as a free economy and that the shift from being the world's principal lender to now getting ourselves into a position where we might at some time borrow is the sort of thing we ought to meet head-on by correcting our basic problems and not trying to put controls around it.

Senator PROXMIRE. Except that we have the difficult situation that interest rates higher abroad necessitate our credit policy which is braking our economic expansion.

I just wonder if this seems to be a wise policy.

Mr. MARTIN. This is where, you see, I think we have a very honest difference of judgment as to whether it is braking the expansion or not. I do not want to get into taxes or into the fiscal policy or other things—but I do not personally think that monetary policy is in any way braking the economy.

Senator PROXMIRE. Let's take the country which is often pointed out to us as a model of success, West Germany. In July 1961 their interest rates dropped 1 percent on new issues at fixed interest.

Following that—I do not have more recent information—their treasury bills continued to drop. Their rate in Germany is now substantially below ours.

It looks like 2.3 in this chart, compared to 2.7, roughly, for ours. Here is Germany, with a very tight employment situation, with almost no unemployed, a great demand for labor, following a policy of relatively easy money, easier than ours even in absolute terms.

Does it make any sense for us to follow a policy of higher interest rates than they have?

Mr. MARTIN. The problem is just in reverse. They had an inflow of funds rather than an outflow of funds. When I was over there a year ago, I talked to several small communities where the receipts on taxes had so far exceeded their expenditures as planned that they were putting in a garden and a swimming pool and a couple of tennis courts just to try to find some means of spending the resources.

Now, they had full employment there. They had an inflow from all over the world because the opportunity for profits was there. The German monetary authorities, I think on the basic point I am making, would agree with me with respect to this matter of braking.

If we had the same thing, we would have low interest rates, and in one way, we have handled this in our country by increasing our savings through permitting the banks to raise the interest rates they have been paying to savers.

Some people have not been happy about it, but there has been an increase in savings which eased rates in the mortgage market and made it possible for municipalities to finance community facilities through bona fide savings that were not there before.

But here in the German situation, you have the reverse problem. They are worried in Germany at the present time; inflation is getting ahead of them now. They have a very real problem on their hands, because they wanted to lower the interest rates to discourage money from coming in.

Senator PROXMIRE. Well, we get into a position apparently, on the basis of your remarks, where interest rates are up or down depending on the inflow or outflow of capital from abroad, rather than depending primarily and fundamentally on what Congressman Reuss and I seem to agree that it should be—that is, the economy, whether the economy should be restrained from inflation, or whether it should be expanded—it seems to me it is most unfortunate. I can understand it in Germany, in the European countries, which are so dependent on foreign trade and international capital movements. But the argument is far less persuasive in this country, where our domestic economy is overwhelmingly dominant and where what happens within our country in terms of both trade and monetary flow seems more significant.

Let me ask you this: I do not mean at all to be impertinent. Business Week said that the high interest rate-big deficit argument which has been made, according to President Kennedy at Yale, by international bankers at Basle, Switzerland—Business Week said this was planted by U.S. representatives abroad in Basle, and I wondered if you had any information as to whether this was correct or incorrect.

Mr. MARTIN. I have no further information at all on it, Senator.

Senator PROXMIRE. Would you be shocked if this were true?

Mr. MARTIN. Yes; I would be shocked if it were true. I doubt very much whether it would be planted.

Senator PROXMIRE. This is from Business Week, which is a very responsible publication.

Mr. MARTIN. Yes, it is.

Senator PROXMIRE. I have just one other question. You have indicated to this committee on many occasions that the Fed does not make the market, it follows the market. For reasons such as this, you have indicated you feel that Fed purchases should not account for more than 20 percent of the trading, exclusive of dealer sales, and so on.

You said this percentage—if this percentage were exceeded, the long-term market would be destroyed.

In the first place, what does it mean to destroy the long-term market? Does it mean if the Fed were to make the market by buying more than 20 percent of the securities sold, nobody would be able to sell long-term debt instruments? I am wondering why you take this arbitrary 20 percent?

Mr. MARTIN. I did not mean to take it as an arbitrary percentage. I simply said when you are the Government, you are a pretty big operator, and if you are going to have any dealing of any sort in securities, there has to be some assurance, some reasonable feeling on the part of investors that they are not bucking up against somebody who is big enough to put them out of business at any time.

Now, there is not a well-developed Government securities market beyond the bill market. Around the country there are arguments why it should be better developed and there are arguments why it should not be better developed. But the nature of our Government securities market today has been that particularly as you extend the maturities—and I think we have had far too much insured maturities, anyhow—but as you extend the maturities, the purchasers of those securities should tend to be people who do not want to trade in them, who want to hold them.

If you are going to be causing ups and downs in those securities all the time on a trading basis, you have an entirely different type of market developing, and I happen to have spent all of my life in this paticular area, so I have some acquaintance with traders.

I know one or two traders who just won't trade in certain issues today.

What you come to eventually is, what the Bank of England is largely doing today. The Federal Reserve would be the whole market in Government securities.

Senator PROXMIRE. I am not proposing to go back to the thirties or early forties when we just pegged bonds at par. I have never advocated that. But on the other hand, it would seem to me wise to adopt a moderate position of being willing to reduce interest rates on long-term obligations for the purpose of attempting to give the greatest opportunity for economic expansion—you can do this without pegging the price at par or without completely dominating or being the whole market.

Mr. MARTIN. Partially pegging is very attractive to people and I do not say it cannot be done. I won't say it is the same as pregnancy, for example. But I would say it has that element in it. Having gone through the period of a pegged Government securities market and trying to get it unpegged, you cannot blame me for wanting to be careful about not getting, by indirection, back into the position where you have no alternative but to peg.

Senator PROXMIRE. Certainly because a few traders would be unhappy and would quit——

Mr. MARTIN. I do not care about these traders at all, but I do care about the market.

Senator PROXMIRE. Except that the objective of our monetary policy ought to be to help our economy grow and expand. It has been used so often, there is nothing radical or new or bold about it. It is just a system which it seems to me is so far more responsible than trying to do this by running a big deficit, cutting taxes at the very time when you are enjoying prosperity except for unemployment, and facing therefore a certainty of an ever-bigger national debt.

This is the alternative.

I am not asking you to comment on that policy. I know you do not want to and I think you are right not to. But this is the alternative, to follow a policy which has such severe penalties and seems so unwise, following a policy of real monetary ease.

Mr. MARTIN. I cannot contribute much, Senator Proxmire, to that.

Senator PROXMIRE. Thank you, Mr. Chairman.

Representative REUSS. Thank you very much, Chairman Martin, and Mr. Noyes, for your usually intelligent, frank contributions to this subcommittee.

The subcommittee has now completed its hearings on the subject of inventories and we stand adjourned.

(The paper entitled "The Contribution of Inventory Investment to Cyclical "Reversals in Economic Activity" referred to on p. 3 follows:)

APPENDIX

THE CONTRIBUTION OF INVENTORY INVESTMENT TO CYCLICAL REVERSALS IN ECONOMIC ACTIVITY [1]

[References in brackets, [ ], in the text are to the numbered list of materials in the bibliography at the end of the report. A technical appendix and three tables of data underlying the charts in the text follows the bibliography.]

1. The Economic Impact of Inventory Investment

Although business inventory investment is, on the average, considerably smaller in magnitude than either producers' investment in durable equipment or new construction expenditure, inspection of chart 1 will reveal that inventory investment is generally subject to more violent fluctuations than other components of investment spending. A closer examination of the historical record will reveal that during periods of cyclical reversals, when inventory accumulation would have generated income and added to effective demand, stocks have moved in the wrong direction. In prosperity, when excess demand prevails, inventory investment has been large in magnitude, contributing to inflationary pressure.

Investment in inventories generates income. Fluctuations in inventory investment affect the level of employment and influence the stability of the economy. The very term "inventory recession" suggests three questions: First, to what extent have the recessions of recent decades been the consequence of changes in the level of inventory investment? Second, if fluctuations in inventory investment do indeed play a major role in cyclical reversals, what factors spark the downward movements in inventory investment? Third, in the light of our limited understanding of the role of inventory investment in cyclical reversals, how much do we really know concerning the effectiveness of the various policy measures advocated as appropriate measures for combating short-run cyclical reversals in economic activity? A section of this paper is devoted to each of these questions.

An approximate answer to the first question is provided by an examination of chart 2, where fluctuations in actual gross national product are contrasted with a hypothetical GNP series corresponding to the path which effective demand would have followed if there had been no fluctuations in inventory stocks. The hypothetical series is obtained by subtracting from actual GNP both inventory investment and an estimate of the consumption it generates.[2]

[1] Prepared by Prof. Michael C. Lovell, Yale University. The author is indebted to Paul G. Darling, Robert J. Eggert, Martin R. Gainsbrugh, John P. Lewis, Louis J. Paradiso, George H. Struthers, and Nat Weinberg for kind criticism and constructive comments on an earlier draft of this paper. The views expressed in this paper are, of course, those of the author and he retains full responsibility both for the opinions expressed therein and for any errors that remain.

[2] The possible impact of stable inventories upon productivity and fixed investment are neglected in this comparison. See note 1 of Technical Appendix for details on the derivation of the data for the hypothetical series.

If there had been no inventory liquidation in the thirties, as inspection of the hypothetical series suggests, the trough of the great depression would not have been so severe. The 1937 and 1949 recessions can both be explained, as a first approximation, by the liquidation of inventory, for without fluctuations in stocks these 2 years would have been characterized by only slight interruptions in the rate of growth rather than definite declines in GNP. The sizable replenishment of stocks in 1946 did smooth the task of reconversion following World War II. During the Korean mobilization, the contribution of record-breaking levels of inventory accumulation to effective demand constituted a serious source of inflationary pressure. At the close of the Korean emergency, a reduction in inventory investment served to deepen the recession. The 1958 cyclical reversal is only partially explained by inventory liquidation.

Inspection of chart 2 also reveals that inventory investment has not contributed much to the secular expansion of effective demand, a prerequisite for economic growth.[3] The second hypothetical series, GNP less producers' durables and consequent consumption, reveals that this category of investment spending has made a major contribution to the growth in effective demand if not to cyclical reversals in economic activity.[4]

In sum, investment in inventories has been perverse in timing and magnitude, contributing to fluctuations in economic activity, to booms and unemployment. The decumulation of inventories played a particularly crucial role in the 1949 downturn; inventory investment was important but of not quite so vital significance in the more recent recessions. Although the cyclical reversals that periodically interrupt the growth of the U.S. economy are characterized by the rapid liquidation of inventory holdings by firms engaged in manufacturing and trade, this brief historical review tells only half the story. Although this review reveals that fluctuations in stocks are a crucial link in the casual chain leading to the generation of cycles in economic activity, it suggests nothing concerning the complex of factors which lead, via their effect upon inventory investment, to cyclical reversals in economic activity. Now one of several factors the individual firm may consider in determining its inventory position is the advantage to be gained in cushioning the impact of abrupt changes in sales volume upon production levels and work force.[5] Explanation is required for the fact that such efforts by individual firms to adjust their inventories in order to stabilize production are frustrated in the aggregate.

[3] This is not surprising; for the contribution of a component of gross private domestic investment to the secular expansion in effective demand and economic growth hinges more upon its average level over the decades than the extent to which it is subject to erratic fluctuations.

[4] The effect of zero investment in plant and equipment upon capacity is suppressed in analyzing the contribution of this category of investment spending to effective demand.

[5] This factor, emphasized by the members of the Carnegie School, is described in detail by Charles Holt and Modigliani [10].

CHART 1.—COMPONENTS OF GROSS PRIVATE DOMESTIC INVESTMENTS, ANNUAL DATA, 1929–61

(Billions of 1954 Dollars)

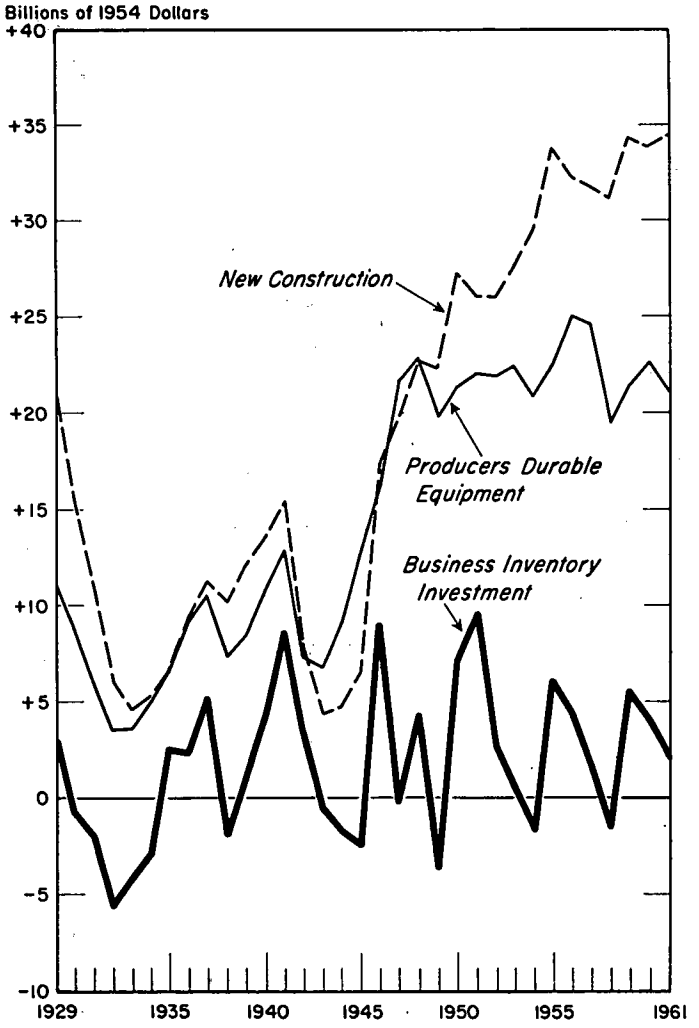
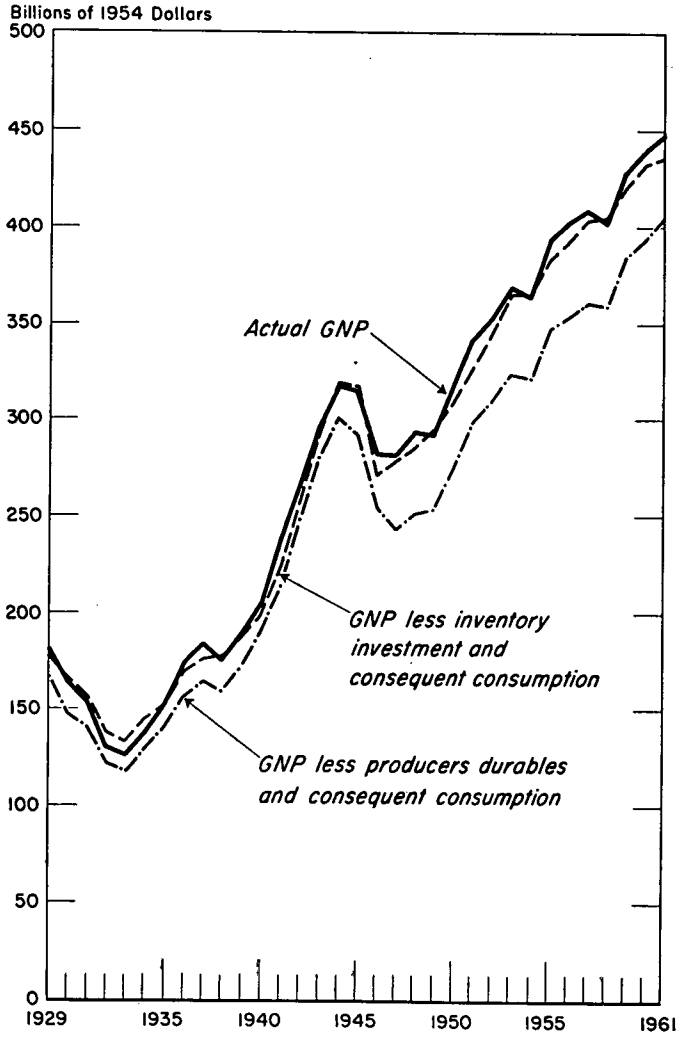


CHART 2.—THE ROLE OF INVENTORY INVESTMENTS IN CYCLICAL REVERSALS



2. EXCESS INVENTORIES AND CYCLICAL REVERSALS

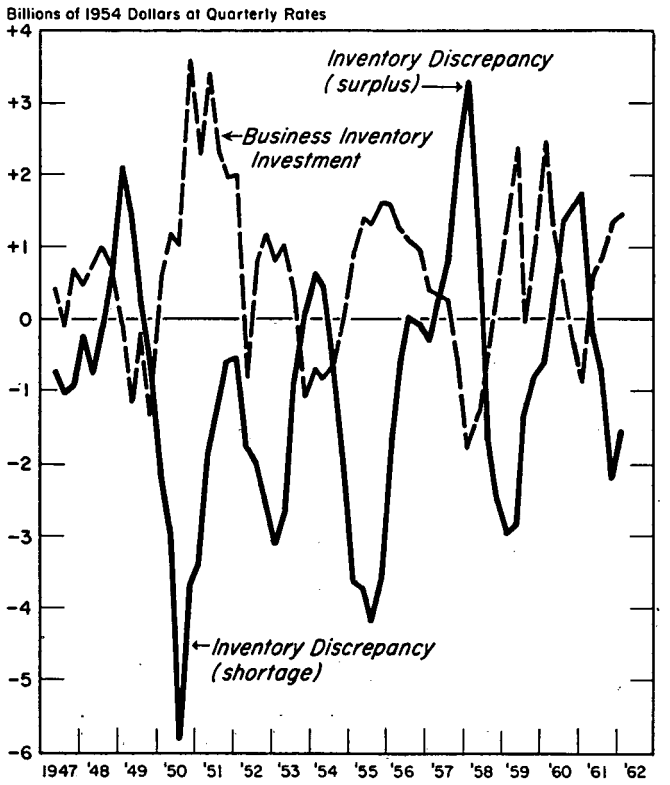
Fluctuations in inventory investment result in part from a dissatisfaction of businessmen with the current level of stocks. Surveys by the Business Roundup staff of Fortune magazine, by McGraw-Hill, by the Department of Commerce, and by the National Industrial Conference Board provide partial evidence concerning the desired level of inventories.[6] In addition, most econometric investigations of inventory investment involve an analytical framework which permits the indirect measurement of the extent to which stocks are

[6] The evidence of the Business Roundup Surveys has been supplemented since 1958 by the Commerce Survey reported in the Survey of Current Business. The results of a single National Industrial Conference Board Survey covering a number of past years are presented by Frederick Stevenson [26].

out of line.[7] From this latter source we now have quarterly estimates of the discrepancy between desired and actual stocks for a number of durable manufacturing industries, for total manufacturing, and for manufacturing and trade combined over most of the postwar period.[8] Chart 3 contrasts business inventory investment with the excess of actual stocks over the level most appropriate for the current volume of sales and the backlog of unfilled orders.[9] As might be expected, rapid inventory investment takes place when stocks are deficient, and conversely.[10]

CHART 3.—BUSINESS INVENTORY INVESTMENT AND SURPLUS INVENTORIES, QUARTERLY 1947–62

(Billions of 1954 dollars at quarterly rates)



[7] An elementary exposition of the flexible accelerator buffer stock model incorporating expectational errors is presented in graphical terms by Lovell [15].

[8] The estimates of excess stocks for durable manufacturing, first presented at the Econometric Society meetings in December 1959, are charted by Lovell [15, p. 122], together with actual inventory investment. Darling [5, p. 57], presents estimates of surplus stocks for total manufacturing. The total manufacturing and trade estimates are to be found in Lovell [16].

[9] See note 2 of Technical Appendix.

[10] See note 3 of Technical Appendix.

Note that during any 3-month period inventory investment serves to eliminate only a fraction of the discrepancy between actual and desired inventories. Lags in delivery as well as costs involved in rapid adjustment of production levels and altering warehouse capacity induce firms to follow a delayed adjustment type of behavior, to attempt to achieve in the current period only a partial adjustment of inventories toward the equilibrium level. Equally important, the desired level of inventories constitutes a shifting target fluctuating rapidly in response to changes in sales volume and the backlog of unfilled orders.[11] Finally, firms cannot anticipate precisely the level of future demand at the time when production levels must be set; when demand exceeds anticipations, the unplanned liquidation of finished goods inventory that occurs in taking advantage of the unexpected opportunity contributes to a gap between actual inventory and the level most appropriate for current sales volume and orders. Attempts by individual firms to replenish inventory stocks generate additional demand, contributing to a further gap between desired and actual stocks. Production schedules are revised in order to meet the increased demand. When the gap is filled, production schedules may have to be revised downward to levels that bear a more realistic relationship to final demand.

Since stocks generally become excessive in the neighborhood of peaks in the business cycle, reversals in economic expansion are characterized by the running down of surplus inventories. Does this imply that the delays experienced by businessmen in adjusting inventories to their equilibrium level are necessarily detrimental? The fact that the marked accumulation of inventories during the Korean period did not suffice to meet the rapid increase in desired stocks suggests that the willingness of firms to tolerate a sizable inventory deficiency during the Korean mobilization served to dampen effective demand during a highly inflationary period. The inertia exercised by businessmen in adjusting inventories has, at certain times, contributed to economic stability.[12]

3. INSTIGATOR OR CONSEQUENCE

Although inventory movements may be largely explained by discrepancies between desired and actual stocks generated by changes in sales volume and the backlog of unfilled orders, this in no way establishes the precise way in which fluctuations in sales and inventories develop and whether they should be regarded as in some sense a fundamental cause, a crucial line in a causal chain, or a mere symptom of cyclical reversals. The casual inspection of the precise timing of peaks and troughs of time series on such variables as orders, inventory investment and inventory stocks, and the general level of economic activity can be an unreliable and, at times, misleading

[11] See note 4 of Technical Appendix.

[12] For a discussion of inventory deficiencies during the Korean period see Lovell [14]; Murray Foss of the Department of Commerce has subsequently pointed out to the writer that these sizable deficiencies may in part reflect the effect of government stockpiling controls on strategic material as well as an element of voluntary inertia. Martin R. Gainsbrugh suggests that the accumulation of inventories of controlled materials may well have been underreported.

procedure for segregating cause from effect.[13] A number of investigators have attempted to introduce order into the confusing array of facts that bear on this issue. On the purely theoretical level are the pioneering studies of Eric Lundburg [18] and Lloyd Metzler [21] of the inventory cycle. Studies with a stronger empirical orientation have been undertaken by D. J. Coppock [3], Duessenberry, Eckstein, and Fromm [6], Michael Lovell [13, 17], Paul Darling [5], Klein and Popkin [11], and Gary Fromm [9].[14] All these investigations involve an attempt to take into account the impact of inventory accumulation upon effective demand as well as such interrelations as that between effective demand, the backlog of orders, and inventory investment. Rather than review in detail these various investigations, it may be more helpful to emphasize certain common features of these studies.

(*a*) The investigators recognized enough of the complexities of the real world to prevent the isolation of any single factor as *the* generator of cyclical reversals. It is always tempting, with fluctuations as with the stock market, to explain everything in terms of some single crucial variable. Unfortunately, the real world is not that simple. Even the least complex of the analyses cited above involves separate relationships to explain the behavior of inventories, the generation of unfilled orders, and consumption spending within the economic system. Cyclical properties of the economy hinge upon all the equations of the system.

(*b*) The investigators were interested in exploring the possibility that the economy may be capable of responding with a number of cyclical fluctuations when subjected to a single erratic "disturbance," such as an abrupt change in Department of Defense orders for military hardware. In terms of the timeworn but comfortable analogy, they allowed for the possibility that the economy is capable of responding, at least in principle, like a rocking chair which rocks backward and forward when struck by a stick. All the investigators were interested in exploring the possibility that the economy's structure may be such that it responds to the shock of a single abrupt change in defense spending with a number of cyclical reversals as it gradually adjusts to a new equilibrium.[15]

(*c*) The empirical investigations have led to a lack of consensus rather than agreement on the issue of how the precise timing of the reversals that have plagued the economy in recent years is to be explained. In terms of the rocking chair analogy, it is a question of whether the timing of its movements is to be explained by the shape of the rockers or the timing of the blows of the stick. On one side

[13] This may be a variant on the "ex post ergo propter hoc" fallacy; not only is there the possibility of coincidence; both downturns may be the consequence of the same cause; the "leading" series may actually depend upon the rate of change in the "lagging" series. The 1950 list of indicators of the National Bureau for Economic Research cited manufacturers' inventories as a series lagging behind the peaks and troughs in the reference cycle. It would have been naive for anyone to interpret this as an indication that the cycle causes the fluctuation in inventory stocks. The 1960 list includes inventory investment as well as new orders among the leading indicators; since inventory investment is simply the change in stocks, this would not be surprising to a mathematician who tends to idealize fluctuations as sine waves whose first derivative necessarily leads by a quarter cycle.

[14] In addition, Jay Forrester [7] and Kalman Cohen [2] have focused in dynamic studies upon interesting subsectors of the economy. Valuable empirical studies are reported by Nestor Terleckyj [27] and Edwin Mills [22].

[15] The remarkable truth, now generally recognized among professional economists, that a model of the economy composed essentially of linear difference equations involving lags is capable of generating cycles is certainly *not* intuitively obvious. Anyone whose commonsense rebels at the notion should derive solace in the thought that less than 25 years ago John Maynard Keynes, in a review of a fundamental work in econometrics by Jan Tinbergen, revealed an apparent misconception of this fundamental principle which now finds its way into the curriculum of introductory economics courses. Numercial examples illustrating the principle in terms of the inventory cycle appear in Metzler [21].

Paul Darling emphasizes that in the last three cyclical reversals the turning points in inventory investment have preceded the turns in equipment production; he argues that the postwar disturbances have demonstrated such regularity as to require explanation in terms of the inventory, order, consumption nexus rather than as isolated responses to individual disturbances.[16] On the other hand, when Gary Fromm found that the estimated parameters of his model implied a quite stable system, he concluded that specific events must have played a role in precipitating each of the postwar dips in economic activity.[17] Abrupt changes in defense orders and government spending as well as shifts in fixed investment spending are singled out by Fromm as precipitating factors.

The debate as to the origin of cyclical reversals has policy implications. If one believes that each postwar recession has constituted the response of a basically stable system to an outside disturbance one might well advocate the adoption of steps that would eliminate the shocks where possible and prepare for discretionary monetary and fiscal action to offset unavoidable disturbances. On the other hand, the conclusion that the economy is capable of responding with a number of cyclical reversals to a single erratic disturbance suggests that a search should be directed at devising "structural" reforms (e.g., reforms which would alter business behavior or the way the economy responds to disturbances), that would contribute to a more stable economy. A review of various policy measures will suggest that regardless of the outcome of this debate, too little is known currently about the effects of various structural reforms that have been suggested; pending the accumulation of additional knowledge, discretionary policy may have to be relied upon to contribute to stability.

4. ELIMINATING CYCLICAL REVERSALS

The obvious costs to the economy in terms of foreign output and unemployment tempt the reformer into advancing panaceas essentially capable of stabilizing the economy. Given the limited nature of our current knowledge, however, there is a danger that reforms will be advocated in advance of a thorough evaluation of their impact, a possibility that might have detrimental effects almost as serious as the opposite danger of inaction. Can structural economic reforms be relied upon to iron out cyclical reversals in economic activity and to mitigate the impact of abrupt changes in exogenous demand, or is it necessary to rely upon discretionary policy?

(*a*) *Taxing inventories*

A tax on the level of inventory stocks has been advocated by at least one economist as a potent stabilizing weapon. Further investigation revealed that such a policy, far from taxing the problem out of existence, might actually have certain detrimental effects. The same may be said for the suggestion that a 25-percent tax on changes in

[16] It must be observed that considerable variation from cycle to cycle is perfectly compatible with this view. While the simple Hansen-Samuelson multiplier interaction model and the Metzler inventory cycle theory both yield quite symmetrical cycles of fixed period, modern models are of a higher order capable of generating asymmetrical cycles of shifting amplitude and changing period.

[17] Fromm's study may be biased toward this conclusion for he himself concedes [9, p. 55] that "in any simulation a model should normally be 'inside' the variation that actually occurs * * *"; his pseudo-realistic situation reveals an apparent tendency for his model to be considerably more stable than the actual economy. Lovell's investigation of the properties of a multisector disaggregated model [17] are inconclusive on the issue; only one real and a pair of imaginary characteristic roots could be evaluated; but the cycles implied by the pair of imaginary roots were of ridiculously long duration and highly damped.

inventory, both accumulation and liquidation, would contribute to stability. The argument for a tax on changes in inventory/sales ratios also has intuitive appeal. Perhaps a tax on yearly changes in the rate of inventory accumulation would indeed induce the individual business firm to attempt to pursue a more stable inventory policy insofar as each individual firm is concerned, but this effect might be frustrated in the aggregate. The very difficult problem here is that a policy proposal which is designed to achieve more stable behavior by each individual firm may, in fact, lead to greater instability for the economy as a whole. Businessmen already have considerable cost incentive to stabilize production and inventory levels; since the perverse nature of inventory movements suggests that the combined efforts of businessmen in this direction have precisely the opposite effect, it is by no means obvious that the application of taxes to increase the cost incentives for inventory stabilization would actually contribute to a more stable economy. Pending additional study of this difficult problem, it seems dangerous to presume that tax measures aimed specifically at inventories would actually serve to stabilize the economy.[18]

(b) Errors of foresight and business confidence

Since discrepancies between actual and desired inventories arise in part because of errors made by firms in anticipating future sales volume at the time that production levels must be set,[19] it might be thought that the dissemination of more accurate knowledge of current business conditions might contribute to stability. There is a danger, of course, that any forecasts that might be disseminated might prove to be erroneous. Furthermore, it is generally agreed that errors in anticipating market conditions are not a prerequisite for the generation of cyclical reversals. Although unaided intuition may suggest the opposite, there is at least some theoretical evidence that more accurate business forecasting per se, far from smoothing the cycle, might actually contribute to instability.[20] While there may be some underlying validity to the cliche that general confidence in a steady upward trend in demand may be self-fulfilling,[21] government attempts to contribute to more accurate knowledge of current business conditions, whatever may be their other benefits, cannot be relied upon as a means of stabilizing cyclical reversals in inventory investment until more is known about their consequences.

(c) Speculative activity and price stability

There is little evidence in support of the proposition that inventory maladjustments are created by the accumulation of speculative stocks prompted by the anticipation of price increases. Discrepancies between actual and equilibrium inventories are explained by inertia and errors in forecasting sales volume rather than by speculative activity. Indeed, anticipations of future cost changes may well have only a

[18] For further discussion see Lovell [17, pt. IV].

[19] In addition to the indirect evidence on this point from econometric studies, we now have the survey results reported by Frederick Stevenson [26, p. 15].

[20] Gary Fromm emphasizes [9, p. 44, footnote 11] the possibility that the publication of the leading indicator series by the Census Bureau, if it leads to the erroneous prediction of false downturns, may have detrimental effects upon the stability of the economy. Michael Lovell [17, pt. III] shows that under certain conditions the assumption of perfect foresight rather than static expectations may lead to instability.

[21] Fromm [9, p. 88] reiterates this point; Lovell [17, pt. III] found that under particular assumptions his multisector model implied that the maintained assumption by businessmen that sales will move to their equilibrium level would, in fact, lead to the realization of that precise condition.

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minor influence, at best, upon the inventory policies pursued by manufacturing firms.[22]

While all this does not imply that government efforts at price stabilization may not have other benefits, it does mean that it should not be expected that such efforts will materially influence the characteristics of inventory movements.

This review of the prospects for structural reform reveals that efforts at installing shock absorbers cannot be relied upon, given the current state of knowledge, to cushion swings in inventory investment. Hopefully, further research into the precise impact of alternative structural reforms may reveal what measures will actually prove stabilizing.[23] In the interim, discretionary policy will have to be invoked in order to offset disturbances that would otherwise give rise to downturns in economic activity. Empirical investigations of inventory behavior have shed a certain amount of light upon the relative effectiveness of monetary and fiscal policy.

(*d*) *Monetary policy*

It is sometimes argued that monetary policy is effective because inventory investment must be particularly sensitive to the costs and availability of credit. In actual fact, empirical verification of this proposition has been fraught with difficulties. A study prepared for the Commission on Money and Credit by E. Cary Brown, Robert Solow, Robert Ando, and John Kareken [1], did suggest that a 1 percentage point rise in the interest rate on bank loans during a quarter would lead to a reduction in the book value of inventories of $1.15 billion during the subsequent quarter, and an ultimate fall of $4.86 billion. These results of the M.I.T. investigation are impressive when quoted out of the context of the carefully phrased qualifying remarks required of the authors by the tentative nature of their study; after all, their attempt to determine a direct link between Federal Reserve policy and inventory investment suggested that restrictions on the availability of credit lead to perverse *additions* to inventories rather than the expected reductions in inventory investment. Paul F. McGouldrick [20] of the research staff of the Federal Reserve Board obtained rather disappointing results in his attempt to extend the M.I.T. study by determining the influence upon inventory holdings of the ratio of liquid assets to current liabilities, the loan/deposit ratio of commercial banks, and the bank rate on short-term business loans. On the other hand, Ta-Chung Liu [12] was more successful in that he found an association between rises in the real rate of interest and declines in nonfarm business inventory, and conversely. Frederick Stevenson's report on the National Industrial Conference Board survey [26, p. 11] lists the availability of working capital and the cost of borrowed funds as the *least* important factor considered by manufacturing firms in deciding to change purchased material stocks.

In view of the conflicting evidence, it would seem unwise at this time to rely upon monetary weapons to have a direct influence upon

[22] This point is supported for manufacturing firms by the National Industrial Conference Board survey reported on by Stevenson [26, p. 11]. For a review of the evidence see Lovell [15, p. 123, and 16].

[23] There has been no extensive investigation of the possibility that secular changes in the economy may have an ameliorating effect upon the character of the postwar downturns. It has been argued that improved productive efficiency engendered by technological advance might prove stabilizing, but the analysis applies only to a particular type of technological change [17]. Although it is sometimes suggested that a secular decline in the inventory sales ratio, the development of more rapid transportation and communication equipment, and the adoption of sophisticated inventory control procedures relying upon electronic computers will fundamentally affect the character of economic fluctuations, these arguments constitute pure conjecture rather than reports on the implications of completed research.

inventory investment.[24] On the other hand, the impact of monetary controls on other sectors of the economy, possibly fixed investment and construction, might provide the fulcrum required if monetary policy is to serve as an effective lever with which to offset swings in inventory investment. It must also be observed that in a period in which interest rate policy must be largely governed by balance of payments considerations, any insensitivity of inventory investment to the rate of interest has definite advantages; it means that a high interest rate policy necessitated by gold outflow would not generate an undesired decumulation of inventory.

(e) Government spending and tax policy

There is a fair degree of consensus among academic economists as to the effectiveness of government fiscal policy as a discretionary weapon appropriate for offsetting economic fluctuations.[25] To the extent that such priorities as the requirements of the military effort permit, government programs may be accelerated during periods of cyclical reversal in order to stabilize the economy. It is sometimes objected that government expenditure is a ponderous weapon that cannot be mobilized with sufficient speed to achieve the right effects at the right time. Murray L. Weidenbaum, in a discusstion of "The Timing of the Economic Impact of Government Spending" [28], has countered this argument with the point that the decision to step up government spending, the purchase of additional military hardware for example, has an initial impact upon GNP well in advance of actual disbursements. After the placement of the contract, inventories of purchased materials and goods in process accumulate; this generates income in advance of the disbursement of funds upon the completion of the production process. Evidence bearing on this point is provided by a comparison of the relationship between Department of Defense obligations and expenditure and quarterly changes in inventories. The data is conveniently assembled for inspection by Gary Fromm [9, p. 46]. Incorporation of Defense Department obligations and expenditure within an equation explaining inventory investment suggests that inventory accumulation is directly stimulated when orders are placed; their impact is felt well in advance of the actual payment.[26] Consequently, the long leadtime involved in altering the level of actual expenditure cannot be cited as an objection to adjusting the level of government activity so as to counter the impact of cyclical reversals in inventory accumulation. Of course, the level of defense expenditure must be dictated largely by military considerations rather than economic conditions; but if we are to maintain a semigarrison economy in the decades to come, it is conceivable that a contribution to that effort will be made if we stress a certain flexibility in the timing of defense as well as nondefense components of government spending [9, pp. 44–47]. On the other hand, the adoption of legislation permitting the flexible adjustment of tax rates in response to shortfalls

[24] Additional material on this issue is provided by Lovell [17]. Fortunately, additional research on this crucial area is underway.

[25] The extent of the consensus on this point among academic economists is indicated by a statement by Prof. Henry C. Wallich, of Yale University, a former member of Eisenhower's Council of Economic Advisers: "When unemployment is high, and so long as prices do not begin to rise, we should be prepared to have a deficit * * *." The statement appeared in the New York Times magazine supplement, June 24, 1962, p. 48.

[26] The results of one regression are presented by Lovell [17]. Unfortunately, data currently available on the financial aspects of the defense effort, particularly during the Korean war era, are not in the form most appropriate for economic analysis.

in the level of economic activity would alleviate the need for a flexible spending policy.

SUPPLEMENT ON RESEARCH PROGRESS

Perhaps the area of strongest agreement among those familiar with the limited extent of our knowledge of the nature of inventory fluctuations is in the need for further research. Let us briefly summarize certain of the main fronts on which research is currently in progress. This will indicate the source of the knowledge reviewed in this paper and reveal the nature of certain roadblocks in the path toward further understanding.

One mode of investigation, emphasized by Thomas Stanback's stimulating paper [25], involves the careful review of the timing of the peaks and troughs of various inventory movements. Such review can lead to the rejection of certain hypotheses, and one important contribution of Stanback's study is the doubt that it casts upon the validity of the most elementary theories of the inventory cycle. At the same time, an examination of the timing of events in the movements of various components of the inventory aggregate cannot reveal the consequences of tax reform, say, upon fluctuations in inventory investment; nor can it segregate cause from effect.

A second line of attack pioneered by Eric Lundberg [18] and Lloyd Metzler [21] involves the investigation of the properities of models which hopefully capture the essential complexities of the actual economy; while such models are often so complex as to defy description in simple terms, they have generally involved the suppression of such factors as capacity restraints, interindustry differences, or the classification of inventories by stage of fabrication. [27]

Econometric investigations attempting to measure underlying relationships and test hypotheses have buttressed the results of theoretical model building by testifying to the reasonableness of certain of the theoretical assumptions, by permitting the generation of pseudorealistic inventory cycles, and by enabling the effects of certain policy measures to be simulated when the models are too complicated to be evaluated analytically. Much of the effort reported in the materials on "Inventory Fluctuations and Economic Stabilization" prepared for the Joint Economic Committee involved this last line of approach.

While it is to be hoped that rapid progress will be made, research is handicapped not so much by the imprecise nature of our measurements of aggregate inventory movements, revealed by table 3,[28] as by the current unavailability of suitable data. Ruth Mack [19] demonstrates that additional data on orders placed by firms by individual industry would provide a useful supplement to data currently avail-

[27] The early models of Lundberg and Metzler suppressed all three of these factors. The Fromm model is macro in character, neglecting the complex problem of aggregation involved in moving from assumptions about the individual firm to their implications concerning the behavior of the whole economy. The Lovell model [17] harps upon interindustry differences at the expense of a host of other complexities such as dividend policy, the behavior of fixed investment and construction, and government transfer payments. In a provocative paper delivered at last December's Econometric Society meetings in New York, Edwin Foster of the University of Minnesota incorporated within a multisector model a stage of fabrication distinction neglected by Lovell; although he is compelled to suppress certain interindustry differences, the results are nonetheless of interest; they are capable of interpretation, when compared with Lovell's, as implying that an economy in which goods are fabricated to specific order is more likely to be stable than one in which goods are manufactured to stock.

[28] The table suggests that preliminary data on GNP movements may have a systematic tendency to substantially overstate both recessional shortfalls in the value of total output and the extent of inventory liquidation that has taken place in each postwar recession.

able on the backlog of unfilled orders in the hands of suppliers. A third problem arises from the fact that a casual inspection of book value inventory figures is likely to be misleading. Particularly during periods of rapid price changes, book value figures may suggest an increase in stocks at the very time that a reduction in their physical magnitude is actually taking place. It would be most helpful, in evaluating current inventory movements, if the National Income Division of the Department of Commerce could make available on an industry-by-industry basis estimates of inventory investment in constant dollars or at least data by industry on changes in book value inventory less the inventory valuation adjustment. While such estimates could hardly be expected to be at all precise, they would probably be no more misleading than book value figures unadjusted for the distortion of price changes and would be most helpful, provided that the user were adequately informed as to the limitations of the data. A more fundamental problem hampering econometric investigation of inventory behavior is the lack of suitable cross-section data on a confidential basis for research purposes reporting at monthly or quarterly intervals on the movement of inventories, sales, and other related variables at the level of the individual firm. Cross-section data have been made available by various agencies for the study of fixed investment and consumption; a complete understanding of inventory behavior will be obtained only when cross-section data on stocks become available on a confidential basis for research purposes.

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TECHNICAL APPENDIX

NOTE: *Comment on chart 2 of text and derivation of hypothetical GNP series*

The impact of fluctuations in inventory investment upon GNP is only roughly measured by "final sales" (GNP less the change in inventory) for this concept neglects the impact of changes in income upon consumption spending. The curve suggesting the way in which effective demand would have behaved if there had been no inventory investment was derived by subtracting the effects of inventory investment upon GNP, as estimated by the multiplier implicit in the Klein-Goldberger econometric model of the United States, from actual GNP. Of course, the resulting series is sensitive to errors in measuring aggregate inventory investment and GNP; table 3 suggests that these errors, particularly for recent cycles, are far from negligible; undoubtedly of greater magnitude are the possible errors resulting from the difficulties inherent in attempting to measure the impact of changes in GNP upon consumption; nevertheless, the resulting series gives a more accurate impression concerning the impact of fluctuations of inventory investment and consequent movements in consumption upon GNP than is obtained by an examination of "final sales." Both series are reported in table 1. A detailed discussion of the procedure utilized in deriving the hypothetical series is to be found in Lovell [13, ch. 1 (see the appended list of references)]. The various series were originally published in the *Cowles Foundation Report of Research Activities, July 1, 1958–June 30, 1961.*

Several equations of the Klein-Goldberger model were utilized in deriving the expression for the effects of alternative assumptions about investment behavior upon the economy. Klein and Goldberger assumed a complex structure in which consumption is determined by deflated private employee compensation, lagged consumption, and the excess of nonwage nonfarm income over corporate savings; wages in turn depend on past income, and corporate savings upon profits. Thanks to helpful suggestions from John Cornwall of Tufts University it was possible to eliminate most of the variables by substitution so as to obtain

$$y_t = 1.3972\ x_t + 0.4805\ y_{t-1} - 0.3633 x_{t-1},$$

where x_t is the deviation of assumed investment from its actual level and y_t is the deviation of the corresponding hypothetical level of GNP from its actual level.

When attention is restricted to the postwar recessions, a more sophisticated approach is permitted by the availability of quarterly constant dollar GNP data. The studies prepared by Lawrence Klein and Popkin [11] and Gary Fromm [9] for the Joint Economic Committee provide a more detailed picture for the more recent recessions by taking many more complications into account.

NOTE 2: *Comment on equilibrium inventory used in deriving data for chart 3 of text*

The expression for equilibrium inventory, H_t', is estimated as $H_t' = 6.1 + .806X_t + .106U_t$, where X_t and U_t are current sales and unfilled orders respectively; see Lovell [16]. It must be mentioned that the estimates of excess stocks obtained by the surrogative acceleration principle procedure are only approximations. They generally suggest that excess stocks are somewhat lower than is revealed by actual surveys. Perhaps this discrepancy is explained by the fact that questionnaires are most frequently answered by comptrollers who are more aware of the costs than the contribution of inventories to production scheduling; for further discussion of this factor, see Murray Foss [8, p. 29].

NOTE 3: *Comment on excess inventory series of chart 3 of text*

Because of imprecisions of the estimating procedure, it is dangerous to place too much reliance upon the precise timing of turning points of the excess inventory series. Table 3 suggests that even data on actual inventory investment is not as precise as it is sometimes regarded by its users. The same caveat must be emphasized with regard to the timing of points at which inventories change from

a surplus to a deficit situation, particularly because of the discrepancy (mentioned in the preceding note) as regard to levels between the survey and the surrogative measurement procedures. For a detailed discussion of the difficulties involved in estimating excess stocks and certain inherent ambiguities, see Lovell [16].

NOTE 4: *Comment on influence of orders on desired stocks*

Orders have been shown to have a direct influence upon manufacturers' holdings of purchased materials and goods in process; if anything, one would expect an inverse relationship between their unfilled order backlog and finished goods inventory, but summing over all categories of inventory yields a strong positive influence of orders upon manufacturing inventory. Lovell [14] reports regressions broken down by stage of fabrication and by individual industry. When one examines the aggregate of manufacturing and trade inventory combined, the effect of manufacturers' orders is still to be observed. Stanback [25] emphasizes the importance of orders; in empirical studies they have been included within the inventory equation by Darling [4, 5], Duesenberry, Eckstein, and Fromm [6], Fromm [9] and Lovell [13, 14].

TABLE 1.—*The role of inventory investment in cyclical reversals, 1929–61*

[Billions of dollars of 1954 purchasing power]

Year	GNP	Business inventory investment	Producers durable equipment	New construction	Final sales (GNP less business inventory investment)	GNP less inventory investment and consequent consumption	GNP less durables and consequent consumption
1929	181.8	3.0	11.1	20.9	178.8	177.6	166.3
1930	164.5	−.7	8.8	15.4	165.2	164.6	148.8
1931	153.0	−1.8	5.9	10.9	154.8	155.2	140.5
1932	130.1	−5.6	3.5	6.0	135.7	138.3	121.3
1933	126.6	−4.2	3.7	4.6	130.8	134.4	118.5
1934	138.5	−2.8	5.0	5.1	141.3	144.6	128.9
1935	152.9	2.6	6.7	6.7	150.3	151.2	140.7
1936	173.3	2.4	9.2	9.4	170.9	170.0	156.9
1937	183.5	5.2	10.5	11.3	178.3	175.5	164.2
1938	175.1	−1.8	7.3	10.1	176.9	175.7	159.4
1939	189.3	1.0	8.5	12.2	188.3	187.5	172.6
1940	205.8	4.5	10.9	13.6	201.3	199.0	185.7
1941	238.1	8.6	12.9	15.3	229.5	224.4	214.4
1942	266.9	3.6	7.4	7.8	263.3	258.4	249.9
1943	296.7	−.6	6.9	4.4	297.3	294.7	281.6
1944	317.9	−1.7	9.2	4.8	319.6	319.1	300.2
1945	314.0	−2.4	12.7	6.6	316.4	317.4	291.1
1946	282.5	9.0	16.1	17.3	273.5	270.6	253.6
1947	282.3	−.1	21.7	19.9	282.4	280.0	243.9
1948	293.1	4.4	22.8	22.7	288.7	285.9	250.6
1949	292.7	−3.6	19.8	22.3	296.3	295.8	252.9
1950	318.1	7.2	21.3	27.4	310.9	308.2	276.4
1951	341.8	9.7	22.0	26.0	332.1	326.0	298.8
1952	353.5	2.6	21.8	26.0	350.9	345.8	310.3
1953	369.0	.5	22.5	27.6	368.5	365.5	324.7
1954	363.1	−1.6	20.8	29.7	364.7	363.8	320.9
1955	392.7	6.1	22.5	33.9	386.6	383.9	348.6
1956	400.9	4.5	25.0	32.3	396.4	392.6	353.0
1957	408.6	1.6	24.6	31.8	407.0	404 0	360.3
1958	401.3	−1.5	19.4	31.1	403.2	402.5	359.6
1959	428.4	5.5	21.3	34.3	422.8	420.6	385.3
1960	440.8	4.0	22.7	33.9	436.0	433.0	393.3
1961	448.8	2.1	21.2	34.4	446.7	436.5	405.3

TABLE 2.—*Nonfarm inventory investment and surplus inventories*

[Billions of 1954 dollars at quarterly rates]

Year and quarter	Inventory investment		Surplus inventory	Year and quarter	Inventory investment		Surplus inventory
	Actual	Estimated			Actual	Estimated	
1947:				1955:			
1st quarter				1st quarter	0.98	1.48	3.62—
2d quarter	0.45	0.40	0.70—	2d quarter	1.45	1.85	3.70—
3d quarter	.10	.32	1.02—	3d quarter	1.35	1.98	4.15—
4th quarter	.72	.55	.98—	4th quarter	1.65	2.00	3.55—
1948:				1956:			
1st quarter	.48	.32	.22—	1st quarter	1.60	1.40	1.62—
2d quarter	.78	.38	.72—	2d quarter	1.25	.72	.55—
3d quarter	1.02	.40	.10—	3d quarter	1.08	.38	.02
4th quarter	.75	.01	.62	4th quarter	.98	.22	.02—
1949:				1957:			
1st quarter	.10—	.60—	2.12	1st quarter	.45	.15	.25—
2d quarter	1.15—	1.05—	1.55	2d quarter	.42	.02	.32
3d quarter	.20—	.38—	.30	3d quarter	.32	.28—	.92
4th quarter	1.35—	.20—	.58—	4th quarter	.50—	.92—	2.38
1950:				1958:			
1st quarter	.60	.80	2.12—	1st quarter	1.75—	1.65—	3.34
2d quarter	1.20	1.40	3.00—	2d quarter	1.28—	1.25—	1.60
3d quarter	1.02	2.35	5.85—	3d quarter	.58—	.22—	.65—
4th quarter	3.62	2.80	3.68—	4th quarter	.48+	.82+	2.45—
1951:				1959:			
1st quarter	2.30	2.25	3.38—	1st quarter	1.52	1.55	2.98—
2d quarter	3.42	1.95	1.85—	2d quarter	2.42	1.75	2.82—
3d quarter	2.30	1.22	1.22—	3d quarter	.02—	.80	1.30—
4th quarter	.98	.62	.60—	4th quarter	1.00	.70	.92—
1952:				1960:			
1st quarter	1.00	.55	.55—	1st quarter	2.48	.87	.55—
2d quarter	.82—	.40	1.80—	2d quarter	1.18	.32	.22
3d quarter	.82	1.02	1.98—	3d quarter	.50	.23—	1.38
4th quarter	1.18	1.20	2.58—	4th quarter	.32—	.70—	1.60
1953:				1961:			
1st quarter	.80	1.38	3.10—	1st quarter	.88—	1.24—	1.78
2d quarter	1.02	1.38	2.68—	2d quarter	.60	.10—	.18—
3d quarter	.38	.62	.92—	3d quarter	.88	.42	.68—
4th quarter	1.08—	.28—	.12	4th quarter	1.38	.92	2.20—
1954:				1962:			
1st quarter	.65—	.42—	.68	1st quarter	1.48	1.10	1.55—
2d quarter	.85—	.50—	.50	2d quarter			
3d quarter	.68—	.18—	.48—				
4th quarter	.02	.52	1.92—				

TABLE 3.—*Revisions of gross national product and business inventory data*

[Billions of current dollars]

Downturn	*Survey of Current Business*, date and page	Gross national product			Inventory investment		
		Peak	Trough	Change	Peak	Trough	Change
1948–49	2/1950, p. 8	262.4	257.4	−5.0	6.5	−2.3	−8.8
	7/1950, p. 9	259.071	255.578	−3.493	5.515	−3.713	−9.228
	2/1952, p. 9		257.3			−3.2	
	7/1952, p. 13	259.045	258.229	−.816	5.029	−2.482	−7.511
	7/1954, p. 5	257.325	257.301	−.024	4.126	−2.737	−6.899
	7/1958, p. 5	259.426	258.054	−1.362	4.708	−3.072	−7.780
1953–54	2/1955, p. 14	364.9	357.2	−7.7	1.5	−3.7	−5.2
	7/1955, p. 9	364.520	360.474	−4.046	1.172	−2.852	−4.024
	7/1956, p. 11	363.218	360.654	−2.564	.254	−2.262	−2.516
	7/1957, p. 9	363.218	361.167	−2.051	.254	−1.915	−2.169
	7/1958, p. 5	365.385	363.122	−2.273	.447	−1.639	−2.086
1957–58	2/1958, p. 8	434.4			.8		
	7/1958, p. 5	440.328			.953		
	2/1959, p. 12	440.3	437.7	−2.6	1.0	−4.7	−5.7
	7/1959, p. 7	442.502	441.702	−.8	1.976	−3,838	−5.814
	7/1960, p. 8	442.769	444.224	+1.455	1.563	−2.518	−4.081
	7/1961, p. 6	442.769	444.546	+1.777	1.563	−1.951	−3.514

(Whereupon, at 11:55, the subcommittee adjourned, subject to the call of the chair.)

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