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# INVENTORY FLUCTUATIONS AND ECONOMIC STABILIZATION

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## JOINT ECONOMIC COMMITTEE CONGRESS OF THE UNITED STATES

PART IV

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# LETTERS OF TRANSMITTAL

MAY 22, 1962.

*To Members of the Joint Economic Committee:*

Transmitted herewith for use by the Joint Economic Committee and other Members of the Congress is part IV of a series of papers prepared by experts from Government, the colleges, and research organizations and assembled under the general title of "Inventory Fluctuations and Economic Stabilization."

The two papers in part IV present the results of original research which supplement the materials on inventory fluctuations published in December, 1961, as parts I, II, and III.

Sincerely yours,

WRIGHT PATMAN, *Chairman.*

MAY 31, 1962.

Hon. WRIGHT PATMAN,
*Chairman, Joint Economic Committee,*
*House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: Transmitted herewith is part IV of a series of papers on the general subject of "Inventory Fluctuations and Economic Stabilization."

Of the papers previously published, those in part I are devoted principally to a descriptive analysis showing postwar inventory fluctuations; those in part II deal with the causative factors in business inventory movements; and those in part III deal with the relationship between inventory movements and economic instability.

The two papers in part IV serve to supplement the previous papers in that they present the results of a survey of the inventory policies and practices of a sample of manufacturing companies, together with the results of a study of an econometric model of the economy wherein inventory fluctuations are assumed to be at or near a minimum.

Prof. Paul G. Darling, on loan to the committee from Bowdoin College, has had major staff responsibility for formulating and directing this study.

Sincerely yours,

WM. SUMMERS JOHNSON,
*Executive Director.*

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# EXPERIENCE IN INVENTORY MANAGEMENT

*A Survey of Large Manufacturing Firms*

BY

FREDERICK STEVENSON
NATIONAL INDUSTRIAL CONFERENCE BOARD

# COMPANY INVENTORY SURVEY: A STUDY OF INVENTORY INVESTMENT PRACTICES AND POLICIES WITHIN A SAMPLE OF MANUFACTURING FIRMS

## Introduction

Generally speaking, there are no other outlets for a manufacturer's products except the satisfaction of customers' present or future orders, or accumulation in unsold stocks. For some manufacturers—of machine tools, for example—little or no output may be of standardized goods, and in this case no stock of finished product is carried (although stocking may take place at the purchased-materials' and goods-in-process stages of fabrication). In the instance of the specification-goods firm, a decline in orders will necessitate an immediate curtailment of output, while a very sharp rise in orders may result in both an increase in output and an expansion in unfilled orders, but finished products do not generally build up in wait for sale.

For the producer of standardized goods, however, a very sharp rise in sales will—in the short run—cause some depletion of inventory, while a very sharp decline in sales causes stocks to accumulate, simply because production, in general, is time consuming and variations in the rate of production cannot be made as rapidly as sales may fluctuate. These two examples are, of course, black-and-white descriptions to facilitate reasoning. Most manufacturers probably produce some specification goods to the customer's firm order as well as some standardized products to stock.

Both categories of manufacturer, however, must carry some purchased materials and work in process and, therefore, both are faced with a problem of adjusting inventories (at some stage of completion) to variations in sales. To some extent, stocks can be adjusted by almost every producer through variations in output. But since production requires time, the more rapid variations in sales, which are beyond the producer's immediate control, involve him in a situation requiring adjustments which will normally be only partially successful. Less-than-partial success may lead him to overreact in subsequent production periods, leading to a heightening of his own inventory control problem and possibly giving rise to a similar overreaction on the part of his suppliers. Thus, lags in the adjustment of output to factors that were originally exogenous to the firm may lead to circles (or spirals) of expectation and overadjustment which cumulate and eventually emerge in aggregate business activity.

One of the purposes of this study was to determine whether the firm behaves as though it considers inventory an active instrument of adjustment to, or the consequence of, sales variations, and to isolate some of the conditions under which these opposing viewpoints seemed to arise. The firm's inventory behavior may also be modified according to the relative importance of its investment in inventory, plant and equipment, selling expenses, to cite but a few of the potentially important factors. If the amount of money normally tied up in inventory is very small in relation to that invested in plant and equipment,

or selling and administrative expenses, then the firm might well consider its time better spent in husbanding these latter resources. These and other possible influences upon the firm's attitude toward inventory management were included in the scope of this study.

Whether considered in terms of relative size of stocks, relative change in stocks, or of timing of inventory changes, manufacturing appeared to be the crucial field for study of the dynamics of inventory investment. It was here, therefore, that we sought information upon the nature of the inventory cycle. For this reason, a sample of large manufacturing companies was selected for a survey designed to indicate whether inventory planning has yet resulted in reducing the discrepancy between planned or desired inventory and actual stocks at strategic points in the course of the year and the business cycle.

Thus, actual stocks are compared with desired or planned stocks in those months of each of the 5 years, 1957–61, when sales were at their minimum and maximum levels, since it was believed that at these points the firm would experience the greatest difficulty in keeping stocks near planned levels. As a check upon the extent of deviation between actual and desired stocks which is normally tolerated by the firm, deviations are also shown at a third point in the year when, as a rule, the difference between actual and desired inventories is probably the least. Furthermore, there is a review of the relationship between inventories and sales, by industry and size of firm, covering the 1957–61 period. Finally, deviations of actual sales from the rates estimated at the beginning of the accounting year are shown for those months of each year in which actual sales were at their highest and lowest volumes. These measures are a direct test of the effectiveness of the firm's sales forecasting, and yield useful comparisons with the degree of success of its inventory planning.

The questionnaire used in the Company Inventory Survey is shown in appendix A. Appendix B describes the method of sample selection and presents several distributions of respondents and nonrespondents among the thousand largest.

### A. Inventory Variations and Company Responses

A key problem of the firm's inventory management is to guard against undue depletion or accumulation of stocks. Where the firm produces standard goods to stock, it is likely to keep a certain margin of product in inventory above the anticipated volume of sales in the next operating period, simply as a precaution against underestimation, other things equal. If sales exceed expectations, then this "buffer" stock can be drawn upon. If, however, sales fall short of the forecast, the buffer will be increased by the amount of scheduled output not actually demanded. While from time to time it may be difficult or impossible for the firm to maintain a buffer in periods of rising business activity owing to the rise in inventory demand of all companies in the firm's market chain becoming superimposed upon a rise in final demand, the burden of this risk both to the firm and to the economy in the form of its deferred and expectational effects is probably less than the burden of an involuntary accumulation of stocks attending an unexpected contraction in sales.

For the firm that produces goods to customers' specifications, stock accumulations and liquidations may be relatively unimportant, on average. In many cases, the production system may be more flexible

in range of possible production rates, but in any case, unanticipated sales changes will be reflected more in the volume of unfilled orders than in inventory. For the company producing to specification, finished goods stocks perhaps usually have no more meaning than goods awaiting shipment, for which the customer has assumed a firm obligation. But even here the possibility of involuntary fluctuations in purchased materials inventories and goods in process is probably as great as for firms producing to stock. In addition, specification goods may have longer production times, on the average, than goods produced to stock (otherwise the risk in stocking would not be too great to carry), so that the backup of work-in-process and purchased materials that may attend a sharp decline in sales and output can perhaps be limited somewhat through postponement of materials orders and curtailment of work schedules.

## EXPERIENCE WITH "MAJOR" INVENTORY MALADJUSTMENTS

These observations are intended only to indicate the potential range of experience manufacturers may have in the management of inventory in the face of unexpected sales variations. The first concern of this section of the study was to ascertain the kinds of experience the firm would refer to as "major maladjustment in its inventory position." With this purpose in mind, we asked the company to state whether it had had such an experience in the past 10 years, and if so, when it occurred, why it thought it had taken place, and the corrective action taken, if any.

Table A–1 summarizes the significant responses to this question by industries and years. Generally the heaviest concentrations of these experiences occurred in the primary nonferrous metal, nonelectrical machinery, fabricated metal products, nonautomative transportation equipment, and petroleum industries.[2]

TABLE A–1.—*Percent distribution of reported inventory maladjustments, by industry and year* [1]

| Industry titles | No. of responses | All years | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 |
|---|---|---|---|---|---|---|---|---|---|
| All manufacturing | | 41<br>100.0 | 2<br>4.9 | 3<br>7.3 | 9<br>22.0 | 8<br>19.5 | 8<br>19.5 | 7<br>17.1 | 4<br>9.8 |
| Durable goods industries | 30 | 73.2 | 0 | 4.9 | 12.2 | 14.6 | 17.1 | 14.6 | 9.8 |
| Primary iron and steel | 2 | 4.9 | 0 | 0 | 0 | 0 | 2.4 | 2.4 | ---- |
| Primary nonferrous metals | 6 | 14.6 | 0 | 0 | 4.9 | 2.4 | 2.4 | 2.4 | 2.4 |
| Electrical machinery and equipment | 1 | 2.4 | 0 | 0 | 0 | 2.4 | 0 | 0 | 0 |
| Machinery, except electrical | 6 | 14.6 | 0 | 2.4 | 4.9 | 4.9 | 2.4 | 0 | 0 |
| Motor vehicles and equipment | 3 | 7.3 | 0 | 0 | 0 | 2.4 | 2.4 | 0 | 2.4 |
| Transportation equipment, excluding motor vehicles | 4 | 9.8 | 0 | 2.4 | 0 | 0 | 4.9 | 2.4 | 0 |
| Stone, clay, and glass products | 3 | 7.3 | 0 | 0 | 0 | 2.4 | 0 | 2.4 | 2.4 |
| Fabricated metal products | 5 | 12.2 | 0 | 0 | 2.4 | 0 | 2.4 | 4.9 | 2.4 |
| Nondurable goods industries | 11 | 26.8 | 4.9 | 2.4 | 9.8 | 4.9 | 2.4 | 2.4 | 0 |
| Food and beverages<br>Textile mill products<br>Paper and allied products<br>Chemical and allied products<br>Rubber products | 6 | 14.6 | 4.9 | 0 | 4.9 | 0 | 2.4 | 2.4 | 0 |
| Petroleum and coal products | 5 | 12.2 | 0 | 2.4 | 4.9 | 4.9 | 0 | 0 | 0 |

[1] Detail may not add to totals because of rounding.

[2] The relatively large percentage shown for nondurables except petroleum is owing simply to the aggregation of responses for the separate industries, no one of which accounted for more than 7 percent of the total in all years.

By years, the greatest incidence of maladjustment fell in 1959 for the durable goods industries, and in 1957 for the soft goods industries. These maximums may be related to the strike against the steel industry and to the onset of recession, respectively. But in 1956—the previous year in which the steel industry was shut down by a strike—there was no similar increase in the rate of inventory maladjustment. However, that strike was more brief, and perhaps for that reason caused less dislocation in steel-consuming markets. It is also possible that the time pattern shown in table A–1 has more to do with cyclical and longer term changes in the relationship between demand and production, than it does with "episodes" that leave a (presumably) temporary imprint upon one or several industries. Thus, the jump in the incidence of dislocation between 1956 and 1957 was perhaps a reflection of the peaking out of the business cycle during that time.

### CAUSES AND CORRECTIONS OF INVENTORY MALADJUSTMENTS

Table A–2 is a cross-tabulation of the frequencies of reported causes of inventory maladjustments against the frequencies of actions undertaken to correct each type. About five-eighths of the reported causes were some variant of unexpected decline in sales, while about a fifth were rooted in labor conflicts. If one may reasonably add "inadequate inventory controls," "inadequate production controls," "sales exceed forecast," and "sales increase" to "unexpected sales decline," then about three-fourths of total causes were rooted in economic changes to which companies could not readily adjust.

TABLE A–2.—*Causes and corrections of inventory maladjustments, in percents* [1]

| | Total of causes | Corrective actions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Increased output (after strike) | Curtailed output | Permitted stocks to grow [2] | Improved forecast methods | Revised inventory controls | Curtailed materials purchases | Delayed shipments | Built new production facilities |
| Manufacturing, total | 100.0 | 18.9 | 40.5 | 2.7 | 2.7 | 13.5 | 13.5 | 5.4 | 2.7 |
| Durables, total | 73.0 | 10.8 | 24.3 | 2.7 | 2.7 | 13.5 | 10.8 | 5.4 | 2.7 |
| Causes: [3] | | | | | | | | | |
| Unexpected sales decline | 45.9 | | 24.3 | 2.7 | 2.7 | 8.1 | 8.1 | | |
| Sales under forecast [4] | 35.1 | | 18.9 | 2.7 | 2.7 | 5.4 | 5.4 | | |
| Recession | 5.4 | | 5.4 | | | | | | |
| Decline in order backlog | 2.7 | | | | | | 2.7 | | |
| Competition | 2.7 | | | | | 2.7 | | | |
| Strikes | 16.2 | 8.1 | | | | | 2.7 | 5.4 | |
| Against industry | 5.4 | 5.4 | | | | | | | |
| Against suppliers | 10.8 | 2.7 | | | | | 2.7 | 5.4 | |
| Inadequate inventory controls | 2.7 | | | | | 2.7 | | | |
| Inadequate production controls | 2.7 | | | | | 2.7 | | | 2.7 |
| Sales exceed forecast | 5.4 | 2.7 | | | | | | | |
| Nondurables, total | 27.0 | 8.1 | 16.2 | 0 | 0 | 0 | 2.7 | 0 | 0 |
| Causes: [3] | | | | | | | | | |
| Unexpected sales decline | 16.2 | | 13.5 | | | | 2.7 | | |
| Stated as such | 5.4 | | 5.4 | | | | | | |
| Recession | 2.7 | | 2.7 | | | | | | |
| Overcapacity | 8.1 | | 5.4 | | | | 2.7 | | |
| Strikes | 5.4 | 5.4 | | | | | | | |
| Against industry | 2.7 | 2.7 | | | | | | | |
| Against company | 2.7 | 2.7 | | | | | | | |
| Sales increase | 2.7 | 2.7 | | | | | | | |
| Merger | 2.7 | | 2.7 | | | | | | |

[1] Detail may not add to totals because of rounding.
[2] According to statements given. Assumed to mean a voluntary accumulation.
[3] According to statements of respondents.
[4] Includes overstatement of forecasted sales in rising markets.

For these economic causes the most frequent corrective actions were, in order of frequency, curtailment of output, revision of inventory controls, and reduction of materials' purchases.

Another type of inventory maladjustment was inquired into through the following question: In recent years has the reporting unit changed the volume of goods-in-process stocks without a similar change in output of finished goods? Of the 21 reports on such an inverse movement, 18 traced the reason to some kind of alteration in the technological conditions of production, and the other 3 spoke of mistaken sales expectations. These dislocations, from whatever cause, occurred as frequently in the soft goods industries as in the durable goods group, relative to the total number of reports in each.

## COMPANY EXPERIENCE WITH INVENTORY CONTROLS

During the 10 years, 1952 through 1961, almost four-fifths of the survey respondents stated that they had not basically changed their methods of determining desired or planned inventory levels. Between three-fifths and two-thirds of the nondurable goods producers maintained their inventory control systems unaltered in the past 10 years, while more than four-fifths of the hard goods manufacturers reported no change in systems. Details are given in table A–3.

### *Nature of changes in inventory controls*

Of the formerly used methods, one primary metals producer stated that it was based "primarily (upon) plant manager's discretion," and of the new system he said, "Formal inventory control plans are now utilized."

A metal fabricator said of his earlier system—

Targets were set on size of total inventory, by quarters, based on past record of "normal" relationship between stocks (at all three stages of fabrication) and sales.

TABLE A–3.—*Inventory control systems*

| Industry titles | Inventory methods changed in last 10 years | | Use of electronic data processing | | |
|---|---|---|---|---|---|
| | Yes | No | Yes | No | Percent of nonusers who plan use |
| | *Percent* | *Percent* | *Percent* | *Percent* | |
| All manufacturing | 22 | 78 | 40 | 60 | 40 |
| Durable goods industries | 13 | 64 | 34 | 42 | 25 |
| Primary iron and steel | 2 | 7 | 5 | 5 | 0 |
| Primary nonferrous metals | 1 | 9 | 3 | 7 | 4 |
| Electrical machinery and equipment | 0 | 8 | 5 | 3 | 2 |
| Machinery, except electrical | 3 | 14 | 9 | 8 | 8 |
| Motor vehicles and equipment | 1 | 6 | 6 | 1 | 2 |
| Transportation equipment, excluding motor vehicles | 1 | 9 | 5 | 6 | 4 |
| Stone, clay, and glass products | 1 | 7 | 1 | 7 | 0 |
| Fabricated metal products | 2 | 5 | 1 | 6 | 6 |
| Nondurable goods industries | 9 | 15 | 6 | 18 | 15 |
| Petroleum and coal products | 3 | 7 | 2 | 8 | 6 |
| Other nondurable goods [1] | 6 | 8 | 3 | 10 | 9 |

[1] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

He described the new system as based upon

analysis of inventory needs through "operations research." For raw materials the amount of stock required to cover the difference between planned and actual production rates. Goods in process and finished product inventory standards were developed by balancing the cost of holding inventories against the savings resulting from larger production runs * * * for each (product) at each plant, so that the overall desired level of inventories becomes the total of the desired inventories for each plant * * * (in order) to operate * * * with substantially smaller inventories than were previously considered normal.

A machinery manufacturer stated that the old system was based upon the "relationship of inventory to current sales" while the new standard was "(a) week of supply based on forecasted sales." In the chemical industry, one respondent stated that the earlier norm was "based on a fixed reorder point" and that the new method was "based on inventory goals determined through use of sales projections." Another nondurable goods producer stated that the old system was based on "calculated economic seasonal inventory levels" and that the new system involved the determination of a "minimum-maximum range based on forecast supply and demand."

*Experience with electronic data-processing systems*

In section C of the questionnaire a series of questions were asked about the use of electronic data-processing equipment in the maintenance of inventory records. As shown in table A–3, two-fifths of the survey respondents answered that they employ such equipment for inventory control. Three times as many companies said they did not use such equipment as said they did among the nondurables, while the proportion of nonusers in the durable goods industries was only a little greater than the percentage of users. Six times as many hard goods firms reported its use as soft goods firms, although respondents in the durable goods industries were only three times as numerous as in the nondurables industries.

Of the 53 companies stating no use of electronic data processing, 21, or two-fifths, said that they have one scheduled for introduction. About half of the nonusers in the soft goods group said they were planning for it, while about a third of the durable goods firms reported a similar intention.

According to the reports, electronic data processing systems are a fairly recent innovation. The earliest year in which such equipment was installed for purposes of inventory control was reported as 1952. The modal year of introduction, however, was 1958.

There was no report of the abandonment of an electronic data-processing system. This may signify many things—satisfaction with its efficiency and its ability to keep current records of inventory inflows and outflows, its improved ability to locate the key points where inventory imbalances develop from time to time, and the increased speed with which needed adjustments may be recognized and made. It may also mean that development of new electronic data-processing equipment has not proceeded so rapidly as to stimulate yet on any large scale the replacement of earlier electronic systems. And in the case of systems installed very recently in the period under review, there has been possibly too little experience with them to warrant a final evaluation of their effectiveness.

Table A–4 suggests a most unexpected outcome of changes in inventory control systems and of the use of electronic data-processing

systems. Of those who took positive steps to revise their methods in these respects, more than two-fifths reported maladjustments in inventory. In contrast, only a third of those who made no change in inventory standards reported a maladjustment. Among firms that had not introduced an electronic data-processing system, the record of maladjustment seemed even more striking—only 27 percent.

TABLE A–4.—*Occurrence of inventory maladjustment, cross-tabulated by system characteristics* [1]

[In percent]

| | No change in inventory controls | | Change in inventory controls | |
|---|---|---|---|---|
| | No maladjustment | Maladjustment | No maladjustment | Maladjustment |
| All manufacturing | 68 | 32 | 58 | 42 |
| Durables | 67 | 33 | 64 | 36 |
| Nondurables | 75 | 25 | 50 | 50 |
| | Firms not using electronic data processing | | Firms using electronic data processing | |
| | No maladjustment | Maladjustment | No maladjustment | Maladjustment |
| All manufacturing | 73 | 27 | 55 | 45 |
| Durables | 71 | 29 | 61 | 39 |
| Nondurables | 79 | 21 | 20 | 80 |

[1] Based upon 85 company reports.

The implication of these findings is that serious inventory imbalances occurred despite the introduction of electronic data-processing systems. But the significance of such an inference would be reduced materially by the frequency with which maladjustments took place *before* rather than after the installation of an EDP system. That is, the relative timing of a maladjustment and the first use of electronic data processing is of importance in gaging the effectiveness of the new systems. If it could be shown that most systems were installed after (and presumably in response to) a serious inventory imbalance, then the implications of the data presented in table A–4 would be modified.

In order to test this hypothesis, wherever such information was given by the respondent we compared the date of inventory maladjustment with that of the first use of EDP. Unfortunately, however, only 16 pairs of dates were reported, so that the significance of the findings hangs on a slender thread. Nonetheless, on the basis of these 16 paired time observations, 7 maladjustments occurred *before* the introduction of EDP, and 9 occurred *after*. Of the nine paired time observations among the durable goods companies, only two inventory dislocations took place *before* EDP was first used. Of the seven pairs of dates available for the nondurable goods industries, however, five revealed that the inventory imbalance did occur *before* EDP was introduced.

On this basis, the percentage data in the fourth column, bottom three rows of table A–4, are all too large. This is especially the case in nondurables, whose figure might be as low as 20–30 percent rather than 80 percent. For durables, the percentage could be as little as 30 percent also, instead of the 39 percent shown. These computations cannot be made definite, however, because relatively few of the companies that reported the introduction and use of electronic data-processing equipment and also a major maladjustment in inventory position attached dates to these events.

Assume for the moment, however, that of all firms that installed EDP systems, roughly 70 percent had undergone no major inventory dislocation subsequently, while 30 percent had (in contrast to the 55–45 percent relationship shown at the bottom right of table A–4). Even if this were roughly the true outline of events, the incidence of maladjustment *after* the installation of EDP systems would approximate the frequency of imbalances experienced by companies that had not installed such systems. (The incidence of "normal" inventory movements would also be about the same between the two groups of companies.) In short, there is no substantial evidence here that electronic data-processing systems had served to reduce the *frequency* of "major" inventory maladjustments. Their *severity*, however, may be reduced through earlier forewarning of developing imbalances.

Why this should be is hard to determine. The recent date of installation of most systems, however, is recalled. In some instances, perhaps, unfamiliarlity may lead to their ineffective use.

More important in explaining this phenomenon, however, may be the manner in which inventory excesses and deficiencies arise. As far as the firm is concerned, most changes in demand (sales) are probably "exogenous," unexpected as to the extent of change that occurs, and therefore difficult for the firm to accomodate itself completely to in the short run. The problem of inventory adjustment may be made harder when the change in demand originates in final goods markets, and the changes in inventory demands of firms at all market levels down to the producer's own become superimposed. The findings of table A–4 may confirm this inference through the general tendency toward a greater frequency of maladjustments among the durable goods industries than among the nondurables (see cols. 1 and 2). Multistage market chains, long and complex production runs, may all play a part in producing fluctuations in sales to which no firm can individually adjust its inventories in the short run, no matter how complete and up to date its recordkeeping procedures may be.

*The nature of inventory standards*

However, the type of norm used by the company to determine desired inventory levels is also of importance in determining the success of its control program. The various standards reported by the firms were characterized as either of the historical type or of the forecast type.

A historical standard would be a norm such as the ratio of inventories to current sales or output, whereas the typical forecast standard would make use of expected future production or sales. Table A–5 reveals that the vast majority of companies use standards of the historical type.

TABLE A–5.—*Measures of stock utilization, by type*

[In percent]

| Industry titles | Purchased materials[1] | | Goods in process [2] | | Finished goods [3] | |
|---|---|---|---|---|---|---|
| | Historical | Forecast | Historical | Forecast | Historical | Forecast |
| All manufacturing | 79 | 21 | 81 | 19 | 66 | 34 |
| Durable goods industries | 58 | 19 | 61 | 16 | 49 | 24 |
| Primary iron and steel | 8 | 2 | 13 | 0 | 2 | 2 |
| Primary nonferrous metals | 6 | 4 | 3 | 3 | 10 | 2 |
| Electrical machinery and equipment | 9 | 2 | 13 | 3 | 5 | 5 |
| Machinery, except electrical | 13 | 4 | 10 | 3 | 12 | 2 |
| Motor vehicles and equipment | 8 | 4 | 13 | 3 | 7 | 0 |
| Transportation equipment, excluding motor vehicles | 6 | 2 | 3 | 3 | 0 | 2 |
| Stone, clay, and glass products | 6 | 2 | 0 | 0 | 2 | 5 |
| Fabricated metal products | 4 | 0 | 6 | 0 | 10 | 5 |
| Nondurable goods industries | 21 | 2 | 19 | 3 | 17 | 10 |
| Petroleum and coal products | 6 | 0 | 13 | 0 | 7 | 2 |
| Other nondurable goods [4] | 15 | 2 | 6 | 3 | 10 | 7 |

[1] Based upon 53 responses.
[2] Based upon 31 responses.
[3] Based upon 41 responses.
[4] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

About a third of the firms replying to the question showed that they employed some measure of forecasted sales or future production requirements to help in determining the optimum size of finished goods stocks. This was a good deal greater than the proportion of about a fifth each using forecast standards for purchased materials and goods in process. This difference may reflect a greater awareness of the effects of exogenous demand pressures upon the growth and decline of finished goods stocks than upon stocks at lower stages of fabrication.

*Relative importance of operating data in the decision to change inventories*

The companies were asked to rank in order of importance various types of operating data considered in a decision to *change* purchased materials stocks and finished goods stocks. The company rankings were then averaged by industry. The findings are shown in table A–6 for purchased materials and table A–7 for finished goods.

TABLE A–6.—*Relative importance of operating data in the decision to change purchased materials stocks (average ranking [1] by industry group)*

| Industry titles | No. of responses | Type of operating data [2] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| All manufacturing | 78 | 4.0 | 3.7 | 3.3 | 6.0 | 2.8 | 7.1 | 5.7 | 1.7 |
| Durable goods industries | 60 | 4.0 | 3.2 | 3.4 | 6.2 | 2.8 | 7.2 | 6.2 | 1.8 |
| Primary iron and steel | 8 | 4.3 | 3.4 | 3.5 | 5.9 | 3.0 | 7.5 | 6.7 | 1.6 |
| Primary nonferrous metals | 8 | 4.1 | 2.7 | 3.4 | 6.2 | 2.4 | 6.8 | 6.2 | 2.9 |
| Electrical machinery and equipment | 7 | 4.4 | 2.9 | 2.9 | 7.0 | 2.8 | 7.7 | 5.3 | 1.8 |
| Machinery, except electrical | 14 | 4.2 | 3.3 | 3.5 | 5.9 | 1.6 | 7.0 | 6.4 | 1.8 |
| Motor vehicles and equipment | 6 | 4.5 | 3.2 | 3.2 | 5.8 | 3.7 | 7.5 | 5.8 | 1.3 |
| Transportation equipment, excluding motor vehicles | 6 | 3.8 | 1.6 | 3.8 | 7.3 | 4.0 | 7.8 | 5.5 | 1.8 |
| Stone, clay, and glass products | 6 | 3.5 | 3.6 | 3.0 | 6.6 | 2.3 | 7.6 | 6.8 | 2.2 |
| Fabricated metal products | 5 | 3.5 | 5.0 | 4.0 | 5.0 | 2.8 | 6.0 | 6.7 | 1.2 |
| Nondurable goods industries | 18 | 3.6 | 5.8 | 2.7 | 5.1 | 2.8 | 6.6 | 3.9 | 1.3 |
| Petroleum and coal products | 8 | 3.3 | 8.0 | 2.5 | 4.5 | 2.6 | 6.0 | 4.0 | 1.6 |
| Other nondurable goods [3] | 10 | 3.9 | 3.6 | 2.8 | 5.7 | 2.9 | 7.2 | 3.9 | 1.0 |

[1] Rankings based upon company reports on types of operating data.
[2] Types of operating data:
1.—Expected changes in prices of materials.
2.—Backlog of unfilled orders.
3.—Changes in availability or delivery periods.
4.—Availability of working capital.
5.—Current production rate.
6.—Cost of borrowed funds.
7.—Capacity utilization of the supplier.
8.—Forecasted or planned rate of production.
[3] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

TABLE A–7.—*Relative importance of operating data in the decision to change finished goods stocks (average ranking [1] by industry group)*

| Industry titles | No. of responses | Type of operating data [2] | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| All manufacturing | 74 | 4.0 | 2.1 | 2.8 | 4.9 | 1.5 | 4.6 |
| Durable goods industries | 55 | 4.0 | 2.2 | 2.8 | 5.0 | 1.5 | 4.4 |
| Primary iron and steel | 6 | 4.2 | 2.6 | 1.7 | 5.0 | 1.6 | 5.8 |
| Primary nonferrous metals | 9 | 3.8 | 1.8 | 2.9 | 4.8 | 1.3 | 4.8 |
| Electrical machinery and equipment | 7 | 4.3 | 2.0 | 2.3 | 5.3 | 1.3 | 5.0 |
| Machinery, except electrical | 12 | 4.4 | 2.0 | 2.2 | 5.4 | 1.8 | 4.6 |
| Motor vehicles and equipment | 6 | 4.3 | 2.5 | 2.7 | 5.8 | 1.3 | 4.3 |
| Transportation equipment, excluding motor vehicles | 4 | 3.0 | 2.5 | 4.0 | 4.0 | 1.0 | 2.5 |
| Stone, clay, and glass products | 6 | 4.3 | 2.2 | 2.5 | 5.3 | 1.8 | 4.8 |
| Fabricated metal products | 5 | 4.0 | 2.2 | 3.8 | 4.3 | 1.6 | 3.7 |
| Nondurable goods industries | 19 | 3.6 | 1.5 | 2.7 | 4.5 | 1.8 | 5.2 |
| Petroleum and coal products | 9 | 3.3 | 1.4 | 3.0 | 4.3 | 1.7 | 5.5 |
| Other nondurable goods [3] | 10 | 3.9 | 1.6 | 2.4 | 4.7 | 1.8 | 4.9 |

[1] Rankings based upon company reports on types of operating data.
[2] Type of operating data:
1.—Availability of working capital.
2.—Ratio of inventories to current sales.
3.—Changes in customer inventory-sales' relationships.
4.—Cost of borrowed funds.
5.—Ratio of inventories to forecasted sales.
6.—Anticipated changes in labor costs.
[3] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

Most companies gave forecast sales and production the first rank as the most important type of operating variable taken into account in a decision to *change* stocks. This seems in contradiction to the data contained in table A–5, where historical standards were found used more often than forecast standards to determine the most desirable inventory *levels*. Question arises whether this discrepancy is real or statistical, and, if real, what its basis is.

Fifty-three companies answered the question regarding criteria for judging desired *levels* of purchased materials, but 25 more firms answered the next question about the relative importance of various types of operating data considered in a decision to *change* (accumulate or liquidate) purchased materials stocks. Forty-one firms responded to the question about criteria for determining the desired volume of finished goods, while 33 additional responses were received to the inquiry concerning the importance of factors considered in deciding to *vary* finished goods inventories.

In tables A–6 and A–7, it is apparent that current sales and production are high, often second, in importance in the list of factors considered in a decision to *change* the level of stocks. From these facts it appears that some companies examine their inventory positions in terms of the size of stocks, and that this tendency is associated more often with historical than with forecast criteria. On the other hand, when a company views the inventory problem in terms of flows of investment (and disinvestment), there seems a slight increase in the importance attached to prospective product demand as the most relevant determinant of inventory requirements. These relationships may be confirmed by the tendency of forecast standards to increase in use for finished goods inventories (cf. table A–5).

Since current (really, historical) sales and production are also prominent in the rankings shown in tables A–6 and A–7, these responses may contain, or conceal, differing views of the problem of inventory control at different stages of fabrication in the firm's production process. The increased importance accorded to forecast criteria shown by these two tables may be owing to the inclusion of more companies that examine their finished goods inventory position more thoroughly than, or to the exclusion of, stocks at lower stages of fabrication. The latter effect seems evidence that where "exogenous" factors appear to management to shape the firm's fortunes, finished goods inventories may seem more and more to possess some of the elements of uncertainty and risk that attach to other relatively inconvertible assets, such as plant and equipment. If this be true, then a greater emphasis upon the anticipation of future demand follows as a logical effort to minimize losses.

*Relative effort applied to control of company investment functions*

Finally, the firm was asked to indicate the importance it attached to the control of the following uses of corporate funds: (1) advertising; (2) inventory; (3) research and development; and (4) plant and equipment.

Tables A–8 and A–9 show the average ranks assigned to these investment functions as classified by industry and size of company. In keeping with their predominance in the firm's cost structure (see table C–5), plant and equipment and inventory were given the top two ranks. In table A–9, note the inverse relationship between the importance of inventory and size of firm.

TABLE A–8.—*Effort expended in controlling assets and activities by industry (average ranking [1])*

| Industry titles | No. of responses | For— | | | |
|---|---|---|---|---|---|
| | | Advertising | Inventory | Research and development | Plant and equipment |
| All manufacturing | 81 | 3.6 | 2.0 | 2.8 | 1.6 |
| Durable goods industries | 63 | 3.7 | 1.9 | 2.8 | 1.7 |
| Primary iron and steel | 7 | 3.7 | 2.3 | 3.0 | 1.0 |
| Primary nonferrous metals | 9 | 3.6 | 1.8 | 3.1 | 1.4 |
| Electrical machinery and equipment | 7 | 4.0 | 1.9 | 2.4 | 1.7 |
| Machinery, except electrical | 14 | 3.1 | 1.7 | 2.9 | 2.3 |
| Motor vehicles and equipment | 5 | 3.8 | 1.6 | 2.6 | 2.0 |
| Transportation equipment, excluding motor vehicles | 8 | 3.9 | 2.0 | 2.5 | 1.6 |
| Stone, clay, and glass products | 7 | 3.9 | 1.6 | 3.1 | 1.4 |
| Fabricated metal products | 6 | 3.3 | 2.0 | 2.8 | 1.8 |
| Nondurable goods industries | 18 | 3.4 | 2.4 | 2.9 | 1.4 |
| Petroleum and coal products | 8 | 3.6 | 2.5 | 2.5 | 1.4 |
| Other nondurable goods [1] | 10 | 3.2 | 2.2 | 3.2 | 1.4 |

[1] Rankings based upon degree of "attention and effort that management devotes to their control."

TABLE A–9.—*Effort expended in controlling assets and activities by size of firm (average ranking [1])*

| Size class [2] | No. of responses | For— | | | |
|---|---|---|---|---|---|
| | | Advertising | Inventory | Research and development | Plant and equipment |
| Durables: | | | | | |
| 1 | 14 | 3.5 | 1.3 | 3.1 | 1.7 |
| 2 | 16 | 3.6 | 1.8 | 2.9 | 1.7 |
| 3 | 33 | 3.4 | 2.1 | 2.7 | 1.7 |
| Nondurables: | | | | | |
| 1 | 1 | 4.0 | 2.0 | 3.0 | 1.0 |
| 2 | 2 | 4.0 | 1.5 | 3.0 | 1.5 |
| 3 | 15 | 3.3 | 2.5 | 3.1 | 1.4 |

[1] Rankings based upon degree of "attention and effort that management devotes to their control."
[2] Firms with under $50,000,000 of total assets.

## B. COMPANY INVENTORY AND SALES BEHAVIOR

### DEVIATIONS OF ACTUAL FROM DESIRED INVENTORY

As indicated in part 5 of section B of the questionnaire (see app. A), the companies were asked to state the month (or quarter) in which sales were at their highest and at their lowest for each of the 5 years, 1957 through 1961. For each of these periods of highest and lowest sales, the companies were also asked to report the percentage amount by which actual total inventories exceeded (+), or fell short of (−), desired inventories. The mean percentage deviations for all reporting companies are shown in table B–1.

TABLE B–1.—*Average deviations of actual from desired inventory at end of month (or quarter) of highest sales and of lowest sales* [1]

[In percent]

| Industry titles | 1957 | | 1958 | | 1959 | | 1960 | | 1961 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | H | L | H | L | H | L | H | L | H | L |
| All manufacturing | +3.2 | +9.9 | −2.0 | +5.4 | +2.0 | +4.3 | +5.7 | +10.1 | +3.7 | +5.3 |
| Durable goods industries | +3.1 | +12.0 | −2.2 | +6.1 | +2.8 | +4.6 | +6.8 | +11.8 | +4.5 | +6.1 |
| Primary metals | +2.5 | +29.2 | −1.6 | +8.8 | −.7 | +7.7 | +1.8 | +14.7 | +11.5 | +10.3 |
| Machinery | +8.0 | +8.8 | +2.6 | +12.8 | +1.0 | +4.7 | +4.4 | +12.6 | +2.0 | +7.1 |
| Transportation equipment | +3.3 | +7.0 | −3.4 | +4.5 | +4.5 | +21.9 | +12.8 | +20.3 | +1.9 | +13.8 |
| Stone, clay, and glass products | ------- | ------- | +3.8 | +2.3 | +3.5 | −6.8 | +10.8 | +6.5 | +7.3 | −.8 |
| Fabricated metal products | −1.5 | +2.8 | −4.9 | +2.0 | +5.8 | −4.3 | +4.0 | +5.0 | −.2 | +.3 |
| Nondurable goods industries | +3.9 | +1.7 | −.7 | +1.8 | −2.0 | +2.7 | +.6 | +1.2 | −.3 | +.9 |

[1] Data based upon mean of individually reported deviations with signs retained, from 76 responses.

NOTE.—H=percentage deviations end of month (or quarter) of highest sales during year; L=percentage deviations end of month (or quarter) of lowest sales during year.

Several broad conclusions are suggested by the tabulations of table B–1. The preponderance of "plus" signs throughout the table seems to indicate a general feeling that actual inventories are almost always somewhat higher than top management would like to see them. On the other hand, the disturbing effects of cyclical swings in the economy manifest themselves in the tabulated data. The percentage excess of actual over desired inventories are relatively high for the periods of lowest sales during the recession declines of late 1957 and of 1960. Thus, during the period of lowest sales actual stocks exceeded those desired by 9.9 percent for all firms in 1957, and by 10.1 percent in 1960. During the period of highest sales in the recovery year of 1958, actual stocks were 2 percent below those desired.

The effects of these cyclical swings in the economy is to produce more severe maladjustments among the durables firms than the nondurables, as is evident from a comparison of the percentage deviations along the last row of table B–1 with those for the second row. Judged by the tabulated deviations for the three cyclical turns mentioned above (1957–L, 1958–H, and 1960–L), primary metals and transportation equipment give signs of being particularly susceptible to these cyclically induced maladjustments. It is also noteworthy that no conclusive evidence appears in this table that the extent of deviations between actual and desired inventories has diminished or increased over the 5-year period. On the contrary, the size of deviations seems related mostly to the cyclical position of the industry.

Table B–2 shows percentage deviations of actual from desired stocks at yearend for same 5 years.

TABLE B–2.—*Deviations of actual from desired inventory at end of year* [1]

[In percent]

| Industry titles | 1957 | 1958 | 1959 | 1960 | 1961 |
|---|---|---|---|---|---|
| All manufacturing | +7.4 | +2.7 | +7.5 | +7.6 | +3.6 |
| Durable goods industries | +8.6 | +3.1 | +8.4 | +9.1 | +4.6 |
| Primary metals | +24.8 | +2.2 | +6.5 | +10.8 | +5.0 |
| Machinery | +6.2 | +3.0 | +7.7 | +7.1 | +3.1 |
| Transportation equipment | +5.3 | +6.0 | +8.0 | +11.4 | +9.0 |
| Stone, clay, and glass products | | | +16.0 | +13.5 | |
| Fabricated metal products | −2.0 | +1.3 | +3.8 | +2.7 | +1.4 |
| Nondurable goods industries | +2.6 | +.9 | +2.7 | −.2 | −.7 |

[1] Data based upon individually reported deviations with signs retained.

## PERFORMANCE OF SALES FORECASTS

How accurate are sales forecasts? The companies were asked to report the percentage by which actual sales varied from forecasted sales *estimated at the beginning of the accounting year* for the month (or quarter) of each year when sales were highest and for the month (or quarter) when sales were lowest, for the 5-year period, 1957–61. In inspecting table B–3, where the respondents' replies are tabulated, one must keep in mind that the italicized condition in the previous sentence introduces a variable factor into the tabulation, i.e., the timespan of the forecast, from the month in which the forecast was made to the month whose sales are the subject of the forecast, varies in the tabulations shown in table B–3.

TABLE B–3.—*Deviations of actual sales for month (or quarter) of highest sales and of lowest sales from sales forecast at beginning of accounting year* [1]

[In percent]

| Industry titles | 1957 | | 1958 | | 1959 | | 1960 | | 1961 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | H | L | H | L | H | L | H | L | H | L |
| All manufacturing | +3.5 | −10.3 | +5.1 | −15.3 | +11.1 | −11.9 | +3.8 | −15.0 | +3.2 | −12.1 |
| Durable goods industries | +4.5 | −9.7 | +5.4 | −16.6 | +13.3 | −13.3 | +4.7 | −16.6 | +4.6 | −13.0 |
| Primary metals | +8.0 | −12.3 | −5.0 | −24.7 | +25.4 | −20.8 | +13.8 | −26.0 | +11.9 | −14.0 |
| Machinery | +15.3 | −13.6 | +17.8 | −16.5 | +15.3 | −13.4 | +6.0 | −13.1 | +10.8 | −6.9 |
| Transportation equipment | +5.4 | −6.4 | +8.3 | −13.3 | +12.9 | −24.2 | +6.8 | −21.2 | +3.5 | −28.5 |
| Stone, clay, and glass products | 0 | −8.4 | +6.3 | −22.7 | +2.3 | +4.0 | −1.7 | −13.7 | −3.3 | −14.7 |
| Fabricated metal products | −6.4 | −7.4 | −12.0 | −5.8 | +10.7 | −12.0 | −1.5 | −9.0 | +.1 | −1.0 |
| Nondurable goods industries | −1.2 | −13.2 | +3.2 | −8.7 | −.1 | −4.2 | −.9 | −7.1 | −3.9 | −7.6 |

[1] Data based upon mean of individually reported deviations with signs retained.

NOTE.—H=percentage deviations for month (or quarter) of highest sales; L=percentage deviations for month (or quarter) of lowest sales.

Allowing for the variation in the timespans of the forecasts, the errors in sales forecasting shown in the table appear large, especially near cyclical troughs. For example, consider the month of lowest sales in 1958. For most companies, this would be a month during the first or second quarter of that recession year, and the sales forecast with which we are concerned would have been made early in the first

quarter (inasmuch as most companies base their accounting year on the calendar year). Thus, the timespan of these forecasts would be about 3 to 6 months. In spite of this fairly short forecast span for all responding manufacturing firms, actual sales fell short of those forecast by 15.3 percent on average. For the recession trough in early 1961 (see the "L" column for 1961 in table B–3), where the forecast span was even shorter, actual sales were 12.1 percent below forecasts. At cyclical peaks, on the other hand, forecasting appears to be more successful. The "H" columns for 1957 and 1960 (both probably lying early in the respective year for most companies) show that actual sales ran in excess of those forecast by only 3.5 percent and 3.8 percent, respectively.

As might be expected, companies producing durable goods experienced greater forecasting difficulties than those producing nondurables. These observations help to illustrate the "exogenous" nature of sales changes for most firms, and pinpoint the difficulty of setting production schedules and inventory targets.

## INVENTORY-SALES RATIOS

In table B–4 are shown ratios of end-of-year total inventories to total sales for the same year, by industry, for the 5 years, 1957–61. The data tabulated represent the averaging of the ratios of industrial companies. As will be seen, inventories are particularly heavy relative to sales among the primary metals, machinery, and nonautomotive transportation equipment companies.

TABLE B–4.—*End-of-year inventory-sales ratios* [1]

[In percent]

| Industry titles | 1957 | 1958 | 1959 | 1960 | 1961 |
|---|---|---|---|---|---|
| All manufacturing | 19.6 | 20.7 | 18.9 | 20.4 | 19.3 |
| Durable goods industries | 20.4 | 21.9 | 19.8 | 21.9 | 20.6 |
| Primary iron and steel | 19.3 | 28.4 | 19.3 | 28.1 | 26.1 |
| Primary nonferrous metals | 18.9 | 22.7 | 20.4 | 23.4 | 22.6 |
| Electrical machinery and equipment | 22.8 | 23.8 | 23.6 | 22.4 | 22.0 |
| Machinery, except electrical | 28.1 | 25.5 | 25.9 | 26.3 | 23.9 |
| Motor vehicles and equipment | 16.3 | 15.5 | 14.0 | 15.7 | 17.2 |
| Transportation equipment, excluding motor vehicles | 23.6 | 24.9 | 21.7 | 21.7 | 21.9 |
| Stone, clay, and glass products | 14.7 | 14.4 | 14.6 | 16.7 | 11.2 |
| Fabricated metal products | 19.3 | 20.2 | 18.7 | 20.5 | 20.0 |
| Nondurable goods industries | 16.5 | 15.9 | 15.4 | 14.6 | 14.1 |
| Petroleum and coal products | 11.9 | 11.7 | 12.4 | 11.0 | 11.3 |
| Other nondurable goods [2] | 21.1 | 20.0 | 18.3 | 18.2 | 16.9 |

[1] Average of the ratios of individual companies.
[2] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

A comparison of the end-of-1958 and end-of-1961 ratios, both lying in periods of cyclical recovery, shows that with the single exception of motor vehicles and equipment companies, inventories were lower relative to sales in 1961 than in 1958. The reasons for this, whether increasing excess capacity or greater experience with electronic data processing equipment or some other factors explain this decline in the ratios, cannot, of course, be adduced from the tabulations in the table.

## C. Characteristics of Reporting Firms

### DISTRIBUTIONS OF SAMPLE AND RESPONDENTS

The questionnaire for the Company Inventory Survey (shown in app. A) was mailed to 302 manufacturing companies in 15 major manufacturing industries. The sizes of the separate industry samples varied widely in accordance with the method by which the sample sizes were determined (see "Note on the Method of Sample Selection," app. B). The overall rate of response was 29 percent (88 reports), not large relative to usual response rates, but good considering the length and complexity of the questionnaire, and large enough to warrant tabulation and analysis.

In both the durable and nondurable goods industries, however, responses to the survey were more heavily weighted in favor of the larger companies than were the samples themselves (see appendix table B–2). Survey response in the smallest of the three size classes underrepresented its proportion in the total sample, in both the durable and nondurable goods industries. In durable goods the respondents in the second, or medium, size class occured in the same proportion as in the entire sample. But nondurable goods respondents of medium size were relatively fewer than firms of the same size in the sample.

There are 46 letters of refusal to cooperate in the survey (see appendix table B–3). These letters were informative in that most gave some reason for not reporting. The reasons fell into four broad divisions—"No system (of inventory controls) in operation"; "Requires too much time" to answer (or, too much staff would be required, or, the cost of reporting would be unwarranted); "Not practical to report" and, "Not applicable to the company." From the nature of the survey response, it is evident that the larger the firm, the more likely it is to have such a system of checks and controls.

### OPERATING CHARACTERISTICS OF RESPONDENTS BY INDUSTRY

1. *Distribution of reporting units by corporate divisions and by market stage of finished products.*—The survey questionnaire gave the respondent the option of reporting either for the company as a whole or for any one of its manufacturing divisions, product groups, or plants located in the United States. The questionnaire made clear that a companywide report would be preferred but that otherwise an operating unit for which the best records are maintained might be reported on. Sixty-eight percent of the reports received covered the company as a whole, with 32 percent limited to a division, a product group, or a single plant. An analysis of the distribution of reports by industry is shown in table C–1.

Table C–2 gives the percentage distribution of reports by product class of the reporting units: primary and intermediate goods, final industrial goods, and final consumer goods.

TABLE C–1.—*Distribution of reporting units*

| Industry titles | No. of reports | Percent [1] of industry reports covering— | | | |
|---|---|---|---|---|---|
| | | The company | A division | A product group | A plant |
| All manufacturing | 88 | 68 | 20 | 9 | 3 |
| Durable goods industries | 67 | 69 | 21 | 7 | 3 |
| Primary iron and steel | 8 | 75 | 25 | 0 | 0 |
| Primary nonferrous metals | 9 | 55 | 11 | 33 | 0 |
| Electrical machinery and equipment | 7 | 86 | 14 | 0 | 0 |
| Machinery, except electrical | 15 | 73 | 7 | 7 | 13 |
| Motor vehicles and equipment | 6 | 83 | 17 | 0 | 0 |
| Transportation equipment, excluding motor vehicles | 9 | 56 | 44 | 0 | 0 |
| Stone, clay, and glass products | 7 | 72 | 0 | 14 | 14 |
| Fabricated metal products | 6 | 50 | 50 | 0 | 0 |
| Nondurable goods industries | 21 | 66 | 15 | 20 | 0 |
| Petroleum and coal products | 9 | 56 | 22 | 22 | 0 |
| Other nondurable goods [2] | 12 | 75 | 8 | 17 | 0 |

[1] Details may not add to totals because of rounding.
[2] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

TABLE C–2.—*Distribution of reports by product class [1] of reporting unit, in percent [2]*

| Industry titles | No. of reports | Primary and intermediate | Final industrial | Final consumer |
|---|---|---|---|---|
| All manufacturing | 88 | 42 | 40 | 17 |
| Durable goods industries | 67 | 44 | 41 | 14 |
| Primary iron and steel | 8 | 80 | 20 | 8 |
| Primary nonferrous metals | 9 | 88 | 11 | 4 |
| Electrical machinery and equipment | 7 | 27 | 55 | 15 |
| Machinery, except electrical | 15 | 13 | 83 | 0 |
| Motor vehicles and equipment | 6 | 25 | 50 | 20 |
| Transportation equipment, excluding motor vehicles | 9 | 25 | 75 | 0 |
| Stone, clay, and glass products | 7 | 64 | 18 | 18 |
| Fabricated metal products | 6 | 33 | 17 | 50 |
| Nondurable goods industries | 21 | 34 | 38 | 29 |
| Petroleum and coal products | 9 | 42 | 58 | 0 |
| Other nondurable goods [3] | 12 | 25 | 17 | 58 |

[1] Product class by market stage.
[2] Details may not add to totals because of rounding.
[3] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellanous nondurable industries.

2. *Sales and purchases in domestic and foreign markets.*—During 1960, the preponderance of trade conducted by the survey respondents was in domestic markets, as measured both by percent of product sales to and of materials purchased in domestic versus foreign markets. Only the primary nonferrous metals units appear to have had a considerable trade in foreign markets, both as to sales and purchases. Details are shown in table C–3.

Also considerably affected by demand trends and patterns in foreign markets during 1960 were firms in the nonelectrical machinery and motor vehicle and parts fields. Otherwise, foreign sales played a relatively minor role in the firms' operations, according to the survey responses.

TABLE C-3.—*Product shipments and materials purchases in domestic and foreign markets* [1]

| Industry titles | No. of reports | Percentage [2] of shipments during 1960 to— | | Percentage of purchased materials from abroad during 1960 | Ordering period [2] for purchased materials from— | |
|---|---|---|---|---|---|---|
| | | Domestic markets | Foreign markets | | Domestic sources | Foreign sources |
| All manufacturing | 88 | 94 | 6 | 5.0 | 42 | 93 |
| Durable goods industries | 67 | 93 | 7 | 3.0 | 49 | 107 |
| Primary iron and steel | 8 | 97 | 3 | .5 | 26 | 42 |
| Primary nonferrous metals | 9 | 87 | 13 | 12.0 | 35 | 90 |
| Electrical machinery and equipment | 7 | 95 | 5 | .8 | 49 | ---------- |
| Machinery, except electrical | 15 | 87 | 13 | .4 | 86 | 91 |
| Motor vehicles and equipment | 6 | 90 | 10 | 3.0 | 36 | 133 |
| Transportation equipment, excluding motor vehicles | 9 | 94 | 6 | .6 | 71 | 201 |
| Stone, clay, and glass products | 7 | 98 | 2 | 2.0 | 33 | 75 |
| Fabricated metal products | 6 | 97 | 3 | .8 | 55 | 120 |
| Nondurable goods industries | 21 | 96 | 4 | 17.0 | 14 | 42 |
| Petroleum and coal products | 9 | 99 | 1 | 19.0 | 13 | 26 |
| Other nondurable goods, [4] | 12 | 93 | 7 | 15.0 | 14 | 57 |

[1] Data are based on unweighted averages of responses.
[2] In days.
[3] Details may not add to totals because of rounding.
[4] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

Materials supplies would appear to pose a problem for the nondurable goods companies, since they appeared to derive a somewhat larger proportion of purchased materials from foreign suppliers (or from subsidiaries abroad) and at the same time the average ordering periods required for materials purchased from foreign sources was about three times as great as the ordering periods for purchase from domestic suppliers. The percentage of foreign materials purchases among the nondurable respondents did not exceed a fifth of total purchases.

3. *Distribution of output to inventory and to firm orders, by industry.*—Table C–4 shows a fairly regular shift in the preponderance of output produced to customers' specification or firm order to output produced to inventory, with a change from the highly complex durable goods (presumably with high fixed overheads) to the less complex hard goods, to the soft goods. Compare, especially, the proportions shown for stone, clay, and glass products, and for fabricated metal products, with any of the groups above them in the table.

In a sense, these ratios may lend to an underestimation of the degree of difficulty experienced by the durable goods producers in exercising control over inventory, since the proportion of goods which is stocked may be subject to postponed sale over long periods when aggregate demand contracts.

TABLE C–4.—*Production to stock and to firm order* [1]

| Industry titles | No. of reports | Percent [2] of total output in 1960 to— | |
|---|---|---|---|
| | | Customer's specification or firm order | Inventory of standardized goods |
| All manufacturing | 82 | 53 | 47 |
| Durable goods industries | 63 | 58 | 42 |
| Primary iron and steel | 8 | 76 | 24 |
| Primary nonferrous metals | 9 | 53 | 47 |
| Electrical machinery and equipment | 6 | 55 | 45 |
| Machinery, except electrical | 14 | 62 | 38 |
| Motor vehicles and equipment [3] | 6 | 89 | 11 |
| Transportation equipment, excluding motor vehicles | 9 | 84 | 16 |
| Stone, clay, and glass products | 6 | 9 | 91 |
| Fabricated metal products | 5 | 33 | 67 |
| Nondurable goods industries | 19 | 33 | 67 |
| Petroleum and coal products | 8 | 40 | 60 |
| Other nondurable goods [4] | 11 | 26 | 74 |

[1] Data are based on unweighted averages of responses.
[2] Details may not add to totals because of rounding.
[3] Covers assembly and parts manufacturing.
[4] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

The large proportions of specification products in the durable goods industries mean that in this area of manufacturing, a sharp increase in demand will be associated with an expansion of unfilled orders. The opposite pattern in the nondurable goods industries, as well as in stone, clay, and glass, and in fabricated metals, implies that a similar increase in demand for these industrial products will be associated with inventory depletion. When demand contracts, the converse changes would, other things equal, take place. These percentages do not, however, take into account the inventories of purchased materials and goods-in-process which must be carried by the durable goods producer, which appear to accumulate rapidly when sales undergo sudden declines.

4. *Relative importance of company investments.*—The respondent was asked to state the six categories of investment and operating data for 1960 shown in table C–5 as a percentage of net sales in 1960. These percentages were ranked by size from largest to smallest for each company. The company rankings were then averaged by industry.[1]

[1] Inspection of the reported percentages revealed a considerable dispersion by industries within each operating category. Since the industry samples were small, it appeared impossible to show any average percentage that would be representative of the group. The graduation of the percentages among the six investment categories, on the other hand, seemed reasonably stable from company to company within industries. For this reason, the array of ranks seemed the only proper way to show the typical patterns.

TABLE C–5.—*Relative importance of company investments, 1960 (average ranking [1] by industry group)*

| Industry titles | No. of reports | Net property account | Year-end inventories | Selling, general and administrative expense | Depreciation, maintenance, and repairs | Cost of advertising | Cost of research and development |
|---|---|---|---|---|---|---|---|
| All manufacturing | 87 | 1.4 | 2.0 | 3.3 | 3.8 | 5.3 | 5.2 |
| Durable goods industries | 66 | 1.5 | 1.9 | 3.3 | 3.7 | 5.4 | 5.2 |
| Primary iron and steel | 8 | 1.0 | 2.3 | 4.0 | 2.8 | 5.4 | 5.3 |
| Primary nonferrous metals | 8 | 1.2 | 1.9 | 3.8 | 3.3 | 5.5 | 5.3 |
| Electrical machinery and equipment | 7 | 1.7 | 1.6 | 3.1 | 4.1 | 5.7 | 4.7 |
| Machinery, except electrical | 15 | 2.0 | 1.4 | 2.7 | 4.3 | 5.5 | 5.1 |
| Motor vehicles and equipment | 6 | 1.4 | 1.7 | 3.4 | 4.0 | 5.3 | 5.2 |
| Transportation equipment, excluding motor vehicles | 9 | 1.8 | 1.3 | 3.2 | 4.1 | 5.8 | 4.8 |
| Stone, clay, and glass products | 7 | 1.0 | 2.7 | 3.2 | 3.1 | 5.5 | 5.5 |
| Fabricated metal products | 6 | 1.8 | 2.1 | 2.9 | 3.9 | 4.8 | 5.6 |
| Nondurable goods industries | 21 | 1.2 | 2.4 | 3.2 | 4.1 | 4.9 | 5.4 |
| Petroleum and coal products | 9 | 1.0 | 2.5 | 3.2 | 4.3 | 4.7 | 5.3 |
| Other nondurable goods [2] | 12 | 1.3 | 2.3 | 3.2 | 3.8 | 5.0 | 5.4 |

[1] Rankings based upon company reports on value of investments in 1960 as percent of net sales in 1960. Where ratios for 2 or more investment functions were equal, the ranks were bracketed.

[2] Includes food and beverages, textile mills products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

Although the pattern was somewhat different in the machinery and nonautomotive transportation equipment industries, the operating and investment functions of the firm were graduated downward in rather stable progression from net property account, at the top of the scale, to advertising costs, at the bottom. With few exceptions, principally those already noted, the gradation of ranks between adjacent functions was much the same, industry by industry. In most cases, net property account was superior to inventories by a considerable margin. This superiority was much more striking, indeed, in terms of the actual reported percentages.

5. *Systems of product distribution, by industry.*—As might be expected, the percentages of firms reporting that sales were made directly to the user were distributed similarly to the percentages of total output made to the customer's specification or firm order (cf. table C–4), with high concentrations in the durable goods industries and low values in the soft goods fields. Table C–6 gives the analysis of these differences by industry.

TABLE C–6.—*Systems of product distribution, by industry*

[In percent of responses [1]]

| Industry titles | No. of responses | Method of distribution | | |
|---|---|---|---|---|
| | | Own wholesale, retail, or dealer chain | Directly to user | Independent wholesale, or retail distributors |
| All manufacturing | 111 | 13 | 57 | 30 |
| Durable goods industries | 82 | 10 | 65 | 25 |
| Primary iron and steel | 8 | 0 | 88 | 12 |
| Primary nonferrous metals | 9 | 0 | 100 | 0 |
| Electrical machinery and equipment | 12 | 17 | 50 | 33 |
| Machinery, except electrical | 20 | 25 | 50 | 25 |
| Motor vehicles and equipment | 8 | 25 | 38 | 38 |
| Transportation equipment, excluding motor vehicles | 9 | 0 | 100 | 0 |
| Stone, clay, and glass products | 8 | 13 | 38 | 50 |
| Fabricated metal products | 8 | 0 | 50 | 50 |
| Nondurable goods industries | 29 | 29 | 23 | 49 |
| Petroleum and coal products | 13 | 38 | 8 | 54 |
| Other nondurable goods [2] | 16 | 19 | 38 | 44 |

[1] Percentage breakdown by method of product distribution. Details may not add to totals because of rounding.
[2] Includes food and beverages, textile mill products, paper and allied products, chemical and allied products, rubber products, and miscellaneous nondurable industries.

## OPERATING CHARACTERISTICS OF RESPONDENTS BY SIZE OF FIRM

1. *Distributions of sales and output, 1960.*—The readers should note in table C–7 the growth in the importance of foreign markets in the firm's operations as the size of the company increases. In the durable goods industries there is also an increase in the percent of total output for firm order as company size increases.

TABLE C–7.—*Distributions of sales and output, 1960, durable and nondurable goods industries, by size of firm* [1]

| Size class | Percentage of 1960 shipments to— | | Percentage [2] of 1960 production for— | |
|---|---|---|---|---|
| | Domestic markets | Foreign markets | Firm order or specification | Inventory or future order |
| Durables: | | | | |
| 1 | 96 | 4 | 57 | 43 |
| 2 | 91 | 9 | 59 | 40 |
| 3 | 91 | 9 | 62 | 38 |
| Nondurables: | | | | |
| 1 | 99 | 1 | 41 | 55 |
| 2 | 98 | 2 | 10 | 90 |
| 3 | 95 | 5 | 33 | 67 |

[1] Size-of-firm classifications are:
1.—Firms with under $50,000,000 of total assets.
2.—Firms with $50,000,000 up to $100,000,000 of total assets.
3.—Firms with $100,000,000 or more of total assets.
Total asset values are taken as of Dec. 31, 1957
[2] Details may not add to 100 because of output not so classified.

In nondurables, in contrast, table C–7 shows that the rise in the importance of foreign markets with increased company size is accompanied by an apparent tendency toward a greater share of production to stock.

2. *Relative importance of company investments, 1960, by size of firm.*—Stability in the relative importance of the six categories of company investment and operations is a feature of their rankings by company size, as it was by industry groups, as shown by table C–8.

TABLE C–8.—*Relative importance of company investments, 1960 (average ranking[1] by size of firm[2])*

| Size class | Net property account (a) | Year-end inventories (b) | Selling, general, and administrative expense (c) | Depreciation maintenance, and repairs (d) | Cost of advertising (e) | Cost of research and development (f) |
|---|---|---|---|---|---|---|
| Durables[3] | 1.5 | 1.9 | 3.3 | 3.9 | 5.4 | 5.2 |
| 1 | 1.5 | 1.9 | 3.1 | 3.8 | 5.4 | 5.4 |
| 2 | 1.7 | 1.9 | 3.2 | 3.7 | 5.4 | 5.1 |
| 3 | 1.5 | 1.8 | 3.3 | 3.8 | 5.5 | 5.1 |
| Nondurables[3] | 1.2 | 2.4 | 3.2 | 4.1 | 4.9 | 5.4 |
| 1 | 1.5 | 1.5 | 3.5 | 3.5 | 5.3 | 5.8 |
| 2 | 1.0 | 3.0 | 2.0 | 5.8 | 4.5 | 4.8 |
| 3 | 1.1 | 2.4 | 3.2 | 3.9 | 4.9 | 5.4 |

[1] Rankings based upon company reports on value of investments in 1960 as percent of net sales in 1960. Where ratios for 2 or more investment functions were equal, the ranks were bracketed.

[2] Size-of-firm classifications are:
1—Firms with under $50,000,000 of total assets.
2—Firms with $50,000,000 up to $100,000,000 of total assets.
3—Firms with $100,000,000 or more of total assets.
Total asset values are taken as of Dec. 31, 1957.

[3] Ranks for durables and non durables are computed from separate industry detail, regardless of size of firm.

3. *Systems of product distribution, by size of firm.*—In the durable goods industries, the use of company owned or operated chain of distributors grows in practice as the size of the firm increases. See table C–9. (The percentages shown for size classes 1 and 2 in nondurables are not significant owing to the small samples involved.)

TABLE C–9.—*Systems of product distribution: Durable and nondurable goods industries, by size of firm*[1]

[In percent]

| Size class | Own wholesale, retail or dealer chain | Directly to user | Independent wholesale or retail distributors |
|---|---|---|---|
| Durables: | | | |
| 1 | 5 | 68 | 26 |
| 2 | 13 | 57 | 30 |
| 3 | 15 | 62 | 23 |
| Nondurables: | | | |
| 1 | 50 | 0 | 50 |
| 2 | 0 | 0 | 100 |
| 3 | 28 | 28 | 44 |

[1] Details may not add to 100 percent because of rounding.

## APPENDIX A

## QUESTIONNAIRE FOR COMPANY INVENTORY SURVEY

NATIONAL INDUSTRIAL CONFERENCE BOARD,
*New York, N.Y., October 11, 1961.*

COMPANY INVENTORY SURVEY

Company Code Number——

The National Industrial Conference Board is asking a small number of manufacturing companies to report on their recent inventory experience. The Board is interested in this topic, because changes in inventory have an important bearing upon the course of general business activity and upon the effectiveness of public actions to promote economic stability and growth.

Briefly, the Board is seeking information on the nature of the companies' production and distribution activities, and on their inventory management under changing business conditions. A general report on the findings will be published by the Board, and an advance copy of this report will be submitted to the Joint Economic Committee of the U.S. Congress, which has expressed an interest in this project.

Although the information requested is not of a confidential nature, the Board will summarize reports in such a manner that the record and comments of the individual company cannot be traced to their source. All quantitative information will be averaged for groups of industries, and comments of significance for the problem under study will be ascribed to "a manufacturer of (durable) (nondurable) (diversified) products." The Conference Board's established reputation for preserving the confidential character of its economic surveys stands behind this pledge. We hope you will feel free to respond fully to the questions.

When referring to your company, please use either the code number assigned to it as shown at the top of this page, or use the word "company." Please do not refer by name either to your company or to any of its plants, divisions, or subsidiaries at any point in this questionnaire. When discussing the experience of a specific operating unit, please refer to it by its principal product(s), as, for example, "the plastics division." This will insure that the identity of your responses will not be known to unauthorized persons.

Please be sure to return this sheet with the questionnaire. Your cooperation is earnestly requested in submitting your report by Friday, November 3, 1961. We will be grateful for your support of this project.

Mr.
Mrs.
Miss

---
(Information supplied by)

---
(Title)

---
(Department)

---
(Date)

## GENERAL INSTRUCTIONS

1. Where quantitative information is requested, please furnish *dollar* figures to the nearest thousand and *percentage* figures to the nearest one percent (calculated from exact, or unrounded, dollar or other data). If percentage responses cannot be furnished to this level of precision, please report them to the nearest five percentage points.

2. When a question cannot be answered, please write "n.a." in the space provided for the answer.

3. If the space for an answer is insufficient, please use additional paper and refer *by number* to the question being answered.

4. If it is not clear what information is sought, you may answer the question in the light of your own experience and interpretation, making a notation of your interpretation in the margin beside the question. Please feel free to inquire about any such questions, however. For prompt reply, write or telephone collect:

National Industrial Conference Board, Inc.
Company Inventory Survey
460 Park Avenue
New York 22, N.Y.
Telephone: PLaza 9–0900

(To be certain that the staff member is qualified to answer your question, you may ask him to give you your company's name in response to your Company Code Number.)

### SECTION A. GENERAL

In this survey questionnaire, you are asked to analyze inventories for either (1) your company as a whole, or (2) any *one* of its major manufacturing divisions, product groups, or plants located in the United States. If it is practical, please make your report for the entire company. Otherwise make your report on that operating unit for which you have the best records on inventories and related data.

1. Please check whether the "reporting unit" covered in your reply is—

( ) a. the company
( ) b. a major manufacturing division
( ) c. a major product group, or
( ) d. a major plant

2. Please complete table A1 after reading the following instructions.

a. In column (a) list the reporting unit's most important *product lines*, up to five, in the order of their contribution to its total sales in 1960. (That is, (1) most important; (2) second in importance; etc.) If the reporting unit produced five or fewer distinct product lines, list all of them.

b. In column (b) enter the *percent of total sales in 1960* accounted for by each product line.

c. In column (c) indicate the *class of product.* (Indicate this simply by entering the appropriate code numbers from the classification listed below.)

TABLE A1

| | (a) Product line | (b) Percent of total sales in 1960 | (c) Class of product |
|---|---|---|---|
| (1) | | | |
| (2) | | | |
| (3) | | | |
| (4) | | | |
| (5) | | | |

*Class of product codes and titles*

Civilian goods for further processing:
- (1a) Industrial and agricultural raw materials.
- (1b) Semi-processed materials.
- (1c) Components for further assembly.

Civilian products for final use:
- (2a) Equipment for manufacturing industries.
- (2b) Agricultural and construction equipment.
- (2c) Equipment for all other nonmanufacturing services and industries.
- (2d) Household and personal durable goods.
- (2e) Household and personal nondurable goods.

Goods produced as prime or subcontractor for U.S. Government:
- (3a) Nondefense.
- (3b) Defense.

Other (please state briefly the classification of these products):
- (4a) ----------
- (4b) ----------

3. Please state the approximate percentage of the reporting unit's total *shipments* during 1960 to:

| | Percent |
|---|---|
| a. Domestic markets[1] (continental United States, Alaska, and Hawaii) | ------ |
| b. Foreign markets[1] | ------ |
| (1) Western Hemisphere | ------ |
| (2) Other foreign areas | ------ |

[1] Please check whether Canada is considered a—
( ) domestic or
( ) foreign market.

4. What percent of total *output* during 1960 consisted of:

| | Percent |
|---|---|
| a. (1) Goods made on order to customers' specifications, and not held in inventory against future orders | ------ |
| (2) What percentage of this was produced under contract with the U.S. Government? | ------ |
| b. (1) Goods normally stocked in inventory against future orders | ------ |
| (2) What percentage of this was ordered by the U.S. Government? | ------ |

5. Please state the following operating data for 1960 as a ratio to Net Sales in 1960:

| | *Ratio to net sales in 1960 (percent)* |
|---|---|
| (a) Net property account | ------ |
| (b) Year-end inventories | ------ |
| (c) Selling, general, and administrative expenses | ------ |
| (d) Depreciation, plus maintenance and repairs | ------ |
| (e) Advertising costs | ------ |
| (f) Research and development costs | ------ |

6. Please check below the reporting unit's *principal* method or system of distributing its products. Company sells:

a. ( ) through its own wholesale system
b. ( ) through its own retail stores or dealer chain
c. ( ) directly to user
d. ( ) to independent wholesale distributors
e. ( ) to independent retail distributors

SECTION B. INVENTORY AND SALES RECORD

1. In this section we would like to obtain information on the reporting unit's experience in inventory management for as many years as possible from 1957 to 1961. We seek this information in terms of deviations of *actual from desired* inventory. This is possible if the reporting unit sets objectives for inventory *levels* or for the rate of inventory *receipts* (either gross or net of disbursements).

If records are not kept on all three standard categories of inventory—purchased materials, goods (or work) in process, and finished products (goods for sale)—information may be furnished for any one or two of the three, or for total inventories. If necessary, information may be based on any major stock-items that are representative of these standard inventory categories.

2. Please check whether information is to be given for:

( ) the inventory aggregates, or
( ) specific representative inventory items.

3. Inventory deviations may be computed on whatever basis the reporting unit uses to state its inventory objectives. Specify below the units in which inventory objectives are established for:

a. Purchased materials: _____
b. Goods in process: _____
c. Finished products: _____
d. Total inventories: _____

4. Please check whether the following information is based upon:

( ) a. *monthly* periods, or
( ) b. *quarterly* periods.

5. Sales and inventory performance:

Sales: Please enter in each year the *months* in which sales of the reporting unit were at their highest and lowest levels. If quarterly figures were used, enter the last month of the quarter.

| | 1957 | | 1958 | | 1959 | | 1960 | | 1961 [1] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | High | Low | High | Low | High | Low | High | Low | High | Low |
| (A) Month | | | | | | | | | | |
| For the months in line A enter the percentage by which actual inventory varied from desired rates. If actual inventory *exceeded* the desired rate, place a *plus* sign before the percentage. If actual inventory was *below* the inventory goal, place a *minus* sign before the percentage. | | | | | | | | | | |
| (B) Purchased materials, percentage deviation | | | | | | | | | | |
| (C) Goods in process, percentage deviation | | | | | | | | | | |
| (D) Finished products, percentage deviation | | | | | | | | | | |
| (E) Total inventories, percentage deviation | | | | | | | | | | |

[1] Estimated, if necessary.

6. Inventory performance at year end: In this section, please enter in each year the percent by which actual inventory varied from desired levels *at the end of the accounting year.* (If the reporting unit's accounting year does not coincide with the *calendar* year, please specify here the month in which the accounting year ends _____).

If actual inventories *exceeded* desired levels, put a *plus* sign before the percentage. If actual inventories were *below* the inventory goal, place a *minus* sign before the percentage.

| | 1957 | 1958 | 1959 | 1960 | 1961 [1] |
|---|---|---|---|---|---|
| (A) Purchased materials, percentage deviation | | | | | |
| (B) Goods in process, percentage deviation | | | | | |
| (C) Finished products, percentage deviation | | | | | |
| (D) Total inventories, percentage deviation | | | | | |

[1] Estimated, if necessary.

7. Inventory levels: Please enter for each calendar year the *months* at the end of which actual inventories were at their highest and lowest levels. (Use numbers from 1 through 12 to signify the months.)

| | 1957 | | 1958 | | 1959 | | 1960 | | 1961 [1] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | High | Low | High | Low | High | Low | High | Low | High | Low |
| (A) Purchased materials | | | | | | | | | | |
| (B) Goods in process | | | | | | | | | | |
| (C) Finished products | | | | | | | | | | |
| (D) Total inventories | | | | | | | | | | |

[1] Estimated, if necessary.

8. Total inventories and sales:

A. Under each year please enter the book value of the reporting unit's total inventories at year-end.

B. The value of total sales of the reporting unit's finished products during the year.

In each instance, information should refer to the *accounting-year* used in filling out table 6.

| | 1957 | 1958 | 1959 | 1960 | 1961 [1] |
|---|---|---|---|---|---|
| (A) Year-end total inventories | | | | | |
| (B) Value of finished-product sales | | | | | |

[1] Estimated, if necessary.

9. Performance of sales forecasts: If monthly or quarterly forecasts are made for sales of finished products, please fill in the following table.

A. Enter under each year the month or quarter (monthly data preferred, if available) in which actual sales were at their highest and lowest volumes.

B. Below each month or quarter, report the percentage by which actual sales varied from forecasted sales *estimated at the beginning of the accounting year.* If actual sales *exceeded* the forecasted volume, put a *plus* sign before the percentage. If actual sales were *below* the forecasted volume, place a *minus* sign before the percentage.

| | 1957 | | 1958 | | 1959 | | 1960 | | 1961 [1] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | High | Low | High | Low | High | Low | High | Low | High | Low |
| (A) Month or quarter | | | | | | | | | | |
| (B) Deviation, actual from forecasted sales | | | | | | | | | | |

[1] Estimated, if necessary.

SECTION C. INVENTORY MANAGEMENT

1. Purchased materials inventories:

a. The percentage of purchased materials that came from abroad during 1960:_____ percent.

b. With respect to a material that is purchased from both domestic and foreign suppliers, how much time must you allow, on the average, between order and receipt in the case of—

(1) domestic purchase: _____

(2) foreign purchase: _____

c. Does your company employ some measure of stock-turnover or stock-utilization to check on levels of purchased materials inventories? Yes ( ); No ( ). If yes, please indicate the type of stock-turnover measure used: _____

d. Please rank the importance of various types of operating data considered in a decision to *change* stocks of purchased materials. (in ranking, let 1 signify most important; 2, second in importance; 3, third in importance, etc.)

| *Type of operating data* | *Rank* |
|---|---|
| (1) Expected changes in prices of materials | |
| (2) Backlog of unfilled orders | |
| (3) Changes in availability or delivery periods | |
| (4) Availability of working capital | |
| (5) Current production rate | |
| (6) Cost of borrowed funds | |
| (7) Capacity utilization of the supplier | |
| (8) Forecasted or planned rate of production | |
| (9) Changes in other factors (please identify) | |

2. Goods-in-process inventories:

a. Does the reporting unit use a measure of inventory turnover for checking whether goods-in-process stocks are at the preferred level? Yes ( ); No ( ). If yes, please indicate the type of standard characteristically used: _____

b. In recent years has the reporting unit changed the volume of goods-in-process stocks without a similar change in output of finished goods? Yes ( ); No. ( ). If yes, please explain the circumstances and reasons: _____

_____

3. Finished goods inventories:

a. Does the reporting unit use a standard measure of turnover for determining the desired size of its finished goods inventories? Yes ( ); No ( ). If yes, please describe the standard used:

_____

b. Please rank the importance of various types of operating data considered in a decision to *change* finished goods inventories. (In ranking, let 1 signify most important; 2, next in importance; 3, third in importance, etc.)

| *Type of operating data* | *Rank* |
|---|---|
| (1) Availability of working capital | |
| (2) Ratio of inventories to current sales | |
| (3) Changes in customer inventory-sales' relationships | |
| (4) Cost of borrowed funds | |
| (5) Ratio of inventories to forecasted sales | |
| (6) Anticipated changes in labor costs | |
| (7) Other (please specify) | |

4. General:

a. Within the last ten years, has the reporting unit basically altered the methods by which it determines desired inventory levels? Yes ( ); No ( ). If yes, please outline below:

(1) the system previously used.

(2) the system now used or scheduled for introduction.

---

---

b. Do you use electronic data-processing equipment to keep continuous inventory records? Yes ( ); No ( ). If yes, give date when first used: ---

If no, is one scheduled for introduction? Yes ( ); No ( ); was one once used but now discontinued? ---
(Check)

If discontinued, please discuss briefly the reasons for the failure:

---

c. In the past few years (since 1952) has the reporting unit experienced a major maladjustment in its inventory position? Yes ( ); or No ( ). If yes, please discuss:

(1) When it occurred: ---

(2) Why it occurred: ---

(3) How it was corrected: ---

d. Please rank (1, 2, 3, etc.) the following uses of corporate funds as to the attention and effort that management devotes to their control:

| | *Rank* |
|---|---|
| (1) advertising | |
| (2) inventory | |
| (3) research and development | |
| (4) plant and equipment | |

Company Code Number ____

# APPENDIX B

## METHOD OF SAMPLE SELECTION AND DISTRIBUTIONS OF RESPONDENTS

A sample of 302 companies was chosen from among the thousand largest manufacturing corporations, as ranked by total assets on December 31, 1957. Allocation of this sample among 15 major industry groups (according to the two-digit system of the Standard Industrial Classification, 1957, of the Office of Statistical Standards, U.S. Bureau of the Budget) was done by the following method:

A minimum and maximum value of the Federal Reserve Board seasonally adjusted production indexes was gathered for each major industry group in each year from 1954 through 1958. The maximum and minimum values for the 5-year period were located (provided that the minimum value was antecedent). The maximum was divided by the minimum, and this ratio was assumed to express a "gross" cyclical amplitude for the specific industry series, including a long-term, or trend, component.

The trend factor was netted out by the following means: Since 1954 and 1958 were marked by reference-cycle troughs, according to the chronology of the National Bureau of Economic Research, the minimum and maximum monthly indexes in each of these 2 years were averaged, and the 1958 average was divided by that for 1954. This ratio was taken as the expression for trend. The gross cyclical ratio was divided by the trend expression to yield a "net" value for the cyclical amplitude of the industry's output.

These net cyclical ratios for the 15 major industries were then ranked from 15 to 1, with 15 assigned to the industry possessing the largest ratio and 1 to the industry with the smallest value. Each rank was then expressed as a percentage of the sum of the ranks (120). When multiplied by 302 (the predetermined sample size for all industries), these percentage weights yielded an approximate number of firms to be sampled in each major industry cell. This weighting scheme was employed so that the size of the industry samples would be graduated in the same relative order as the cyclical amplitudes of production. The resulting sample sizes for the major industries are shown in the third column of table B–1.[1]

[1] The "Instruments and related products" group is omitted from this table because the computed sample size was too small for useful separate analysis. It is likewise omitted from the body of the report.

TABLE B–1.—*Distributions of sample, respondents and nonrespondents, by industry*

| Industry titles | Number of— | | | Per-cent re-spond-ents to total sample | Percent distribution within— | | |
|---|---|---|---|---|---|---|---|
| | Re-spond-ents | Nonre-spond-ents | Sample | | Re-spond-ents | Nonre-spond-ents | Total sample |
| All manufacturing | 88 | 214 | 302 | 29 | 100 | 100 | 100 |
| Durable goods industries | 67 | 149 | 216 | 31 | 76 | 70 | 72 |
| Primary iron and steel | 8 | 28 | 36 | 22 | 9 | 13 | 12 |
| Primary nonferrous metals | 9 | 10 | 19 | 47 | 10 | 5 | 6 |
| Electrical machinery and equipment | 7 | 33 | 40 | 18 | 8 | 15 | 13 |
| Machinery, except electrical | 15 | 21 | 36 | 42 | 17 | 10 | 12 |
| Motor vehicles and equipment | 6 | 15 | 21 | 29 | 7 | 7 | 7 |
| Transportation equipment, excluding motor vehicles | 9 | 17 | 26 | 35 | 10 | 8 | 9 |
| Stone, clay, and glass products | 7 | 16 | 23 | 30 | 8 | 7 | 8 |
| Fabricated metal products | 6 | 9 | 15 | 40 | 7 | 4 | 5 |
| Nondurable goods industries | 21 | 65 | 86 | 24 | 24 | 30 | 28 |
| Food and beverages | 2 | 8 | 10 | 20 | 2 | 4 | 3 |
| Textile mill products | 2 | 18 | 20 | 10 | 2 | 8 | 7 |
| Paper and allied products | 3 | 12 | 15 | 20 | 4 | 6 | 5 |
| Chemical and allied products | 2 | 13 | 15 | 13 | 2 | 6 | 5 |
| Petroleum and coal products | 9 | 7 | 16 | 56 | 10 | 3 | 5 |
| Rubber products | 3 | 7 | 10 | 30 | 4 | 3 | 3 |

This principle was adopted because it was believed on a priori grounds that the difficulty of inventory control at the company level was positively related to the relative extent of cyclical instability in its industry's output, and that a sample thus drawn would yield optimal information about microeconomic inventory behavior.

Tables B–1 and B–2 present distributions of the sample, the respondents and nonrespondents, by industry and by size of firm.

Table B–3 shows the distribution of kinds of explanations given in the 46 letters of refusal to cooperate in the survey which were received.

TABLE B–2.—*Percent distributions of sample, respondents, and nonrespondents classified by size* [1] *of firm*

[In percent]

| | Size classes: | | | Total |
|---|---|---|---|---|
| | (1) | (2) | (3) | |
| Sample: | | | | |
| Manufacturing total | 32 | 24 | 44 | 100 |
| Durable | 38 | 25 | 37 | 100 |
| Nondurable | 17 | 21 | 62 | 100 |
| Respondents: | | | | |
| Manufacturing total | 18 | 22 | 60 | 100 |
| Durable | 21 | 25 | 54 | 100 |
| Nondurable | 10 | 10 | 80 | 100 |
| Nonrespondents: | | | | |
| Manufacturing total | 38 | 24 | 37 | 100 |
| Durable | 46 | 24 | 30 | 100 |
| Nondurable | 20 | 25 | 55 | 100 |

[1] Size-of-firm classifications are: (1), firms with under $50,000,000 of total assets; (2), firms with $50,000 000 up to $100,000,000 of total assets; (3), firms with $100,000,000 or more of total assets. Total asset values are taken as of Dec. 31, 1957.

TABLE B–3.—*Letters of refusal to the company inventory survey, distributed by type of explanation, and classified by size [1] of firm*

[In percentages]

| Type of explanation | No system in operation | | | Requires too much time | | | Not practical to report | | | Not applicable to the company | | | No reason given | | | Total refusals [2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size classes | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | |
| All manufacturing industries | 7 | 7 | 11 | 4 | 4 | 11 | 7 | 9 | 11 | 9 | 9 | 9 | 2 | 2 | 0 | 100 |
| Durable goods industries | 6 | 9 | 6 | 6 | 3 | 12 | 9 | 9 | 12 | 12 | 6 | 6 | 3 | 0 | 0 | 100 |
| Nondurable goods industries | 8 | 0 | 23 | 0 | 8 | 8 | 0 | 8 | 8 | 0 | 15 | 15 | 0 | 8 | 0 | 100 |

[1] Size-of-firm classifications are:
1—Firms with under $50,000,000 of total assets.
2—Firms with $50,000,000 up to $100,000,000 of total assets.
3—Firms with $100,000,000 or more of total assets.
Total asset values are taken as of Dec. 31, 1957. (Detail may not add to totals because of rounding.)
[2] Based on 46 letters of refusal to cooperate.

# INVENTORIES, BUSINESS CYCLES, AND ECONOMIC STABILIZATION

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## I. Introduction

During the past decade much has been stated and written about the basic postwar stability of the American economy, and until recently, some economists had even been led to the conclusion that the business cycle was a thing of the past. Nevertheless, the two recessions of the last 4 years tend to indicate that we cannot simply bury this bogey which has plagued all countries in all eras. Even given the so-called "automatic stabilizers," we have been experiencing significant declines in output and employment from previous peak levels.

The recessions of 1948–49 and 1953–54 might readily be ascribed to peacetime readjustments from war conditions.[2] Each period witnessed a decline in Government expenditures, the completion of conversion from war to private goods production, and the reaction to a surge in consumer spending following restraints and asset accumulations of the conflict years. This explanation may suffice for the early recessions, but how are we to account for the rollbacks of 1957–58 and 1960–61? In both instances, again, Government expenditures played a role, but other factors (including monetary policy), too, must have been important.

It is not our purpose here, however, to explore the general overall economic history of the past 16 years or to launch an extensive theoretical analysis of the sources of instability.[3] Let it suffice to say that fluctuations in Government orders and expenditures coupled with their resulting impact on, and the independent variation of, private business investment appear to bear the principal responsibility for recent stability difficulties in the U.S. economy.

This is not to say that inventory declines have been unimportant, but only that it is unlikely that such reversals, alone, without the impetus and reinforcement of Government expenditure or investment cutbacks, would have produced cyclical reversals of the magnitude that have been experienced in the last decade. After all, inventory stocks are held for the purpose of satisfying future sales demand. For the former to get severely out of equilibrium requires a strong boom in inventory speculation and accumulation or continued inventory investment in excess of current requirements on the basis of optimism for prolonged high levels of sales demand. Except for the

[1] Computer and research time for this paper were provided through the generosity of United Research Inc. A limited number of the calculations were also performed at the Computation Center at the Massachusetts Institute of Technology. The author is grateful to Paul G. Darling, James S. Duesenberry, and Otto Eckstein for helpful advice and criticism.

[2] Some economists, for example, Paul G. Darling ("Inventory Fluctuations and Economic Instability," Inventory Fluctuations and Economic Stabilization, Part III, Joint Economic Committee, U.S. Congress, Washington, D.C., U.S. Government Printing Office, 1961), would disagree with this statement regarding the 1953–54 recession, holding that the recession was primarily caused by a contraction in consumption expenditures and an adjustment in inventory positions. While it is felt that these factors probably were of some importance, it seems unlikely that so severe a decline would have occurred without the reduction in Government expenditures that took place in 1953. This topic receives further treatment in a succeeding section of the paper.

[3] This material is covered in various sources. See, for example, Bert G. Hickman, Growth and Stability of the Postwar Economy, Washington, D.C., Brookings Institution, 1960.

anticipation and post-steel-strike reaction of 1959, neither of these conditions seems to apply to the 1950's. A recent study found that manufacturers' inventory stocks were deficient in 19 out of the 32 quarters from 1953 to 1960, inclusive, and that in no quarter did excess stock exceed 8 percent of that on hand.[4] Notwithstanding the fact that more than this simple evidence is required (since inventory accumulation has a feedback effect on sales) to verify the conclusion, it appears doubtful that inventory adjustments are the *primary* source of the last three recessions. *As long as the near-term (1 to 2 years) demand situation appears favorable, and the level of plant and equipment and commercial construction investment expenditure is maintained, normal, nonspeculative inventory adaptations will probably do no more than cause increases or diminutions in the short-term rate of growth.* If Government intervention is not imposed, personal consumption expenditures.[5] and nonfarm residential construction, for the most part, are highly stable. Therefore, variations in business fixed investment and Government orders and expenditures (when revenues are not set to compensate for expenditure alterations) are more likely candidates for key roles as primary cyclical destabilizers.[6]

On the whole, business investment will move in such a way as to reinforce the direct effect of Government actions. When the latter tend to increase national income, private investment will respond in a similar direction. The process does not stop here, however. A high rate of private investment will, in turn, appear to justify an even higher level of investment, and so forth, until the point, given no further reinforcing factors, when firms and individuals realize that the capacity generated by high sales expectations exceeds the immediately foreseeable demand for the products and services of the investment goods. Then a reaction sets in and a rapid downward adjustment of investment demand ensues.

In general, Government fiscal activity can be either stabilizing or destabilizing, depending on whether it offsets or reinforces the basic tendencies toward instability inherent in the private economy.[7] If fiscal and monetary policy were carried out under conditions of perfect foresight and calculable effects, with the primary goal the stability of income, then Government actions might always be stabilizing. But, given bad forecasting, human indecisiveness and lack of courage, political motivations, and other objectives than economic stability, Government fiscal and monetary policy is frequently detrimental to economic stability and growth. This is not to say that Government actions are always destabilizing, for certainly the application of automatic and discretionary monetary and fiscal policy can do much to mitigate the excesses of booms and recessions. It is merely to indicate that subsequent private decisions will, in the absence of other countervailing restraints, mirror those of the Government sector and perhaps overreact to them.

The questions that then arise are: Aside from introducing an optimal pattern for Government demands, what can be done to mitigate the

[4] Darling, op. cit., p. 56.

[5] Declines in personal consumption expenditures have also contributed to the postwar cyclical reversals, but population trends and consumption habits have generally caused a rapid recovery in consumption.

[6] Nevertheless, while inventory behavior may not normally be the impetus for a cyclical decline, once a reversal has begun, it manifests itself mainly through inventory decumulation. Thus, if losses in output of the economy and high unemployment in recessions are to be prevented, it is essential that measures to stabilize inventory disinvestment be implemented.

[7] This point is explored in Bert G. Hickman, "Federal Spending and the Stability of the Postwar Economy," Federal Expenditure Policy for Growth and Stability, Joint Economic Committee, U.S. Congress, Washington, D.C., 1957.

final effect of fluctuations in Government expenditures on the economy? Can the interaction coefficient be reduced and the business sector be more effectively insulated against the vagaries of Government fiscal instability? What would be the net result of more stable business investment behavior, especially that of inventories which undergo the wildest swings from positive to negative accumulation?

It is the purpose of this paper to explore the aggregative implications of the last question. To this end, the rationale underlying inventory decisions was first considered. A dynamic, empirical, quarterly model of the U.S. economy was then constructed in order to enable simulations of alternative stabilization policies with different inventory patterns. These simulations of recession and total period behavior from the fourth quarter of 1953 through the second quarter of 1963 were then analyzed to derive policy conclusions for Government action.

In the following, section II discusses theoretical inventory behavior; section III, the simulations; section IV presents the model in detail; and section V, the implications for Government policy.

## II. Theoretical Inventory Behavior

In order to draw any conclusions about the possibility of even partial Government stabilization of private inventory behavior, one must first analyze the basic accumulation motive, the inventory decision process, and any long-term trends in the structure of the economy and in the mechanics of business inventory control. Only then may one decide whether an attempt by Government to alter the inventory change pattern is feasible.

### A. BASIC ACCUMULATION MOTIVES

It is, of course, more than obvious that inventories of many different types are accumulated at the various stages from raw and semifinished materials production to final demand consumption. At the final levels, we are confronted with the finished goods inventory accumulation motives of retailers and wholesalers (and some manufacturers who sell investment goods directly out of stock); and, at the initial stages, with both finished goods stock maintenance and work-in-process requirements of the manufacturing sector. To a great extent, the underlying rationale of inventory acquisition at all stages and of all types is similar.

Primarily, inventories serve as an aid to reducing the time lag between the request for goods and the completion of the sale. This lag, if no inventories were maintained in the system, would be a function of the speed of communications, the length of time necessary for production and transportation, and any delays introduced by the need for integrating the decisions and responses of the different elements in the production process. Human inertia factors would also have to be taken into account. When inventories are available at the point of the demand request, these delays are avoided and the transaction can be completed immediately. For the case of finished products in a competitive economic system, this may be vitally important to an individual firm because a potential customer always has the alternative of going to a competitor to satisfy his demand. The inventory maintained by the seller may thus have the advantage

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of giving him a sale he might otherwise not have made. It also saves the buyer the time and the expense of looking elsewhere for the goods. The rationale underlying inventory accumulation of this type has generally been characterized by the name of the buffer stock motive.

In the realm of raw materials and work-in-process inventories, similar objectives motivate the entrepreneur. Obviously, if production is to take place at all, some minimum work-in-process inventory is unavoidable—i.e., those semifinished goods which, when completed, are already destined for a buyer. Our concern in stabilization policy is not with these inventories, however. It is with those that are discretionary and available within the manufacturing facility for fulfilling demands which have not as yet been received. The availability of uncommitted stocks of items within the production system permits the more rapid fulfillment of orders without necessitating any delays for raw and semifinished materials procurement or starting the production process afresh for each specific incoming new order. The inventories thus act in much the same way as do those of buffer stocks of finished goods.

Within the manufacturing sector, both types of inventory serve another purpose. This is to permit the production of economical quantities of a particular item. If production runs were of extremely short duration and of high frequency (that is, many changeovers from production of one goods to another took place in a short interval of time) then there would be much time and money spent in altering production setups to accommodate each new production run. These costs could be avoided if each production run could be lengthened, the frequency of changeover reduced, and an inventory accumulated to satisfy any interim demands for either finished goods, work in process, or raw materials inputs.

It should be noted, of course, that maintaining a stock of inventory is not cost free. The firm does have to make an investment in such goods and, as a result, must bear the costs of storage and deterioration and the risks of product obsolescence (both at the finished goods and work-in-process stage), the chance that prices may fall, reducing the value of the stock accumulated, and the opportunity and interest costs of funds tied up in the goods. On the gain side, there are the economies of longer length production runs, lower order costs due to a reduced frequency of ordering, and the possibility of attaining a greater sales volume.

If expected sales were known with a high degree of certainty, then the firm could readily balance the various costs and gains and decide on an optimum inventory policy for the sales forecast period. As sales become more and more uncertain and when the opportunity cost of a lost sale due to a stockout is high (e.g., if the potential purchaser never returns), then the firm must maintain a larger buffer stock to protect itself from the danger of unsatisfied potential customers. At the same time, the higher degree of sales uncertainty may also mean that the risks of product obsolescence are increased, thus acting as a dampening factor on the accumulation motive. On net balance, the greater degree of uncertainty is likely to serve as a force reducing inventory stocks rather than increasing them.

To this point, we have concluded that the stock of inventories that sellers wish to hold is a function of the potential sales that they envision for some period which is within their short-term planning horizon. The inventory policy for the period will then be influenced by the degree to which their anticipations of sales in the period have been fulfilled and the expectation of future sales in the following period. The ready potential availability of items ordered from other sellers and any other anticipated delays in acquiring or producing goods may alter the inventory decision as well. At each point in the consideration of these various factors, the degree of certainty with which the elements of the inventory decision can be deduced will have an impact on the resultant inventory policy. The seller will perform all of these evaluations and then introduce them into the basic inventory determination as dictated by the various relevant costs and benefits outlined above—to recapitulate: storage and potential obsolescence costs, order costs, production startup and changeover costs, potential price fluctuations, investment opportunity costs, and the gain from satisfying prospective purchasers whose demands could not otherwise be fulfilled.

To this juncture, it has been assumed that the inventory decision process is costless and can be made individually for every item, and that inventories and orders for current and future period sales do not already exist in the system. Both suppositions are false and will be modified in the following section.

### B. THE DECISION PROCESS

The basic accumulation motives for maintaining inventories were discussed in the preceding analysis. In what follows, the decision process and the other influences that determine short-run inventory investment in the economy will be explored.

Let us assume that the various cost factors (per unit) cited above are constant and suppose that at the beginning of some period, $t$, the firm is to make a decision as to the level of inventories it wishes to have at the end of the period. This level will then be related to the expected sales and production, $S^*$, the firm will experience in the following period, $t+1$. If the relationship is linear, then the equilibrium end-of-period stock, $I_t^*$ may be represented by

$$I_t^* = \alpha + \beta S_{t+1}^*.$$

This assumes that we have lumped together the requirements for finished goods, purchased materials, and work-in-process inventory in the $\alpha$ and $\beta$ coefficients and have equated production with some multiple of sales (reflected in $\beta$) in period $t+1$.

The amount of equilibrium inventory investment that would take place in period $t$ is then $I_t^* - I_{t-1}^*$. But we have not necessarily started out with the equilibrium stock at the beginning of the period, i.e., $I_{t-1}$ is not necessarily equal to $I_{t-1}^*$. Therefore, the amount of inventory investment to be made is actually $I_t^* - I_{t-1}^* + (I_{t-1}^* - I_{t-1})$. Due to many factors, however, principally the uncertainty of future sales volume and the cost of radically altering ordering and production plans for many heterogeneous items, the firm may not wish to adjust the discrepancy between the beginning-of-period equilibrium stock

and the actual stock in one period. Thus, only some lesser percentage, say $\gamma$, will be made up or cut back. Therefore,

$$\Delta I_t^* = I_t^* - I_{t-1}^* + \gamma(I_{t-1}^* - I_{t-1}),$$

$$\Delta I_t^* = \alpha + \beta S_{t+1}^* - \alpha - \beta S_t^* + \gamma(\alpha + \beta S_t^* - I_{t-1}),$$

$$\Delta I_t^* = \alpha\gamma + \beta\gamma S_t^* + \beta(S_{t+1}^* - S_t^*) - \gamma I_{t-1}.$$

Just as the equilibrium beginning-of-period stock need not equal the actual inventory, so actual sales during the period need not equal those expected. Thus, for finished goods, planned inventory investment may deviate from that which actually occurs. The sales discrepancy will result in a direct addition to the amount of inventory equal to $S_t^* - S_t$. This still leaves the firm with the problem at the beginning of the period of estimating $S_t^*$.

There are many possible devices it might use to make this estimate, from simply extending a multiple of last period's sales to this period (e.g., employing the average long-term trend in sales) to employing forecasts of total activity within the economy related to a particular industry's and its own share of the market. If the firm resorts to the former method, then

$$S_t^* = (1+\delta) S_{t-1},$$

and

$$S_{t+1}^* = (1+\delta) S_t^* = (1+\delta)^2 S_{t-1}.$$

Therefore,

$$\Delta I_t = \alpha\gamma + \beta\gamma(1+\delta) S_{t-1} + \beta[(1+\delta)^2 S_{t-1} - (1+\delta) S_{t-1}] - \gamma I_{t-1} + (1+\delta) S_{t-1} - S_t.$$

Simplifying and collecting terms,

$$\Delta I_t = \rho + \mu S_{t-1} - \gamma I_{t-1} - S_t,$$

or

$$I_t = \rho + (\mu - 1) S_{t-1} + (S_{t-1} - S_t) + (1-\gamma) I_{t-1}.$$

This result is similar to that of Lovell, except that he also includes an adjustment for any systematic failure to anticipate future sales.[8] Any within-period ($t$) flexibility of the production process and purchased goods orders could be reflected in the coefficients as well as the time lag of the sales terms.

A further modification might be made in the coefficients by inclusion in the equation of other information that the firm possesses. The level of unfilled orders outstanding at the beginning of the period represents a reasonably established commitment to deliver goods in the current and future periods. This justifies additions to stock over these periods in order to meet the already revealed demands. Some advance ordering of purchased materials may also be undertaken to act as a hedge against the possibility of future shortages and price fluctuations. A previous rise in the backlog of unfilled orders in period $t-1$ may act in a similar manner, indicating that current

[8] Michael Lovell, "Manufacturers' Inventories, Sales Expectations, and the Acceleration Principle," Econometrica, July 1961.

production (and work-in-process inventories) should be increased so as not to lengthen further the delay experienced by prospective purchasers in acquiring the ordered goods.

If firms really do speculate in inventories to a significant extent on an expected price basis, then further modifications of the inventory relation will result. An attempt at profitable speculation would dictate an increase in inventory levels above those actually required for expected production and sales when prices were to rise, and a cutback when the reverse was true.

Thus far, then, it has been deduced that inventory investment should be a function of the variation of sales, production, orders, and perhaps prices. The relation we have set forth, under the not unreasonable assumption of relatively constant short-term inventory storage costs and benefits, supposedly will explain the variation in inventories to a high degree. Actually, it will not do so. This is because, for several reasons, inventory behavior of business firms obeys no such simple rules.

For one, the average firm stocks several hundred different items whose demand, supply conditions, deterioration, obsolescence, and cost are not uniform and do not vary, from item to item, proportionately with the demand for finished products of the company. Therefore, in any specific period, the desired inventory level need not change exactly as it did in a previous period, given like changes in the total volume of sales and production. It is also impossible, within reasonable total cost limits for the entire task of inventory management, to control precisely the desired inventory for every item. Thus, due to less stringent control and the desire for the same degree of protection, the average level of stocks maintained may be somewhat higher than dictated by the previously outlined considerations. This also means that inventory investment will not necessarily parallel the theoretical behavior described.

In particular, the principle of passive inventory investment or disinvestment advanced by Ruth Mack is thought to have great merit.[9] Firms do not make precise analyses of the amount to be held of any item or even the entire inventory stock. Instead, they postulate that the stock should fall in a certain range (whose level and bandwidth depends on the various cost factors), and that variation within this band is largely a matter of indifference. This concept is not completely alien to the equations above, in that they include a gradual adjustment of actual stocks to equilibrium levels, but always on the basis of a fixed linear rate of diminishing the discrepancy. As Modigliani has indicated, the linear (though not the nonlinear) rate concept is suspect in that firms are more apt to adjust a discrepancy rapidly if it is large than if it is small.[10]

An inventory adjustment mechanism of this type still appears unsatisfactory. A sounder hypothesis may be that firms are generally indifferent to fluctuations of inventory in a general range when sales conditions and prospects are relatively stable or increasing on a moderate growth path. If extraordinary changes in sales are expected, however, then the firm undertakes a rapid inventory adjustment

[9] Ruth P. Mack, "Characteristics of Inventory Investment: The Aggregate and Its Parts," Problems of Capital Formation: Concepts, Measurement, and Controlling Factors (Studies in Income and Wealth, Vol. 19, National Bureau of Economic Research), Princeton, Princeton University Press, 1957.

[10] Franco Modigliani, "Business Implications for Holding Inventories and Their Macro-Economic Implications," ibid.

program.[11] In fact, there may be a tendency toward overreaction. When sales are expected to decline markedly, the firm may tend to either systematically overestimate the actual fall in volume or, believing that it will reap greater benefits by drastically reducing inventories (under the supposition that it stands little risk of customer loss in that adequate supplies can be obtained or produced rapidly), undertake measures to cut inventories below equilibrium levels. In a boom situation, the opposite psychology may prevail.

What this means in essence is that an inventory function which relies solely on structural variables should normally be a fairly accurate predictor when conditions in the economy are basically stable, but that its explanatory power breaks down when the expectations of future sales levels depart markedly from those experienced in the current period. To cope with this situation in a statistical sense one would have to introduce sales expectations specifically into the inventory equation; to remedy it in the real world, sales expectations would have to be stabilized via appropriate Government action (in the realm of the impact of its own orders on the system) and total economic behavior which revealed a high degree of cyclical stability.

Government demands do have a considerable effect on the economy, especially in the already extremely volatile durable goods manufacturing sector. The major cutback in orders for aircraft in 1957 probably explains the entire subsequent reduction in inventories of the airframe manufacturers and approximately 10 percent of the decline in inventories of the 1957–58 recession.[12] Table 1 presents figures for Department of Defense expenditures for procurement and research, development, test and evaluation. It would appear, when one compares the latter with cyclical fluctuations in the economy, that variations in DOD obligations should share a major burden of the responsibility for the last three cyclical declines.[13] Although past congressional studies (see footnote 13) had explored this subject, the recent hearings of the Joint Economic Committee did not, un-

[11] It is interesting to note that wide dissemination of the publication of the leading indicator series by the Bureau of the Census (Business Cycle Developments, a monthly report of the U.S. Department of Commerce) may have the exactly opposite stability effect from its original objective. If the indicators point to a downturn some months in the future, businessmen will revise their expectations and investment decisions accordingly. If their behavior had not been so modified, then perhaps only a moderate decline in output would have occurred. With the revision, however, the recession becomes more severe. The converse holds true when booms are predicted. Thus, rather than improving stability prospects, the publication of the leading indicator series may result in a deterioration of the situation. These effects, of course, depend on the assumptions (which are presumed to be reasonable) that firms, at the time the indicators are issued, generally underestimate the actual changes which are to take place and that the leading series are more accurate predictors of future events than the aggregate consensus of business opinion.

Another consideration is that the National Bureau series, on which the census material is patterned, have been noted for the number of false turns they have forecast. Thus, response in the direction of the indicators, when in fact they are wrong, might cause cyclical havoc.

[12] James S. Duesenberry provided this observation.

[13] Notwithstanding the fact that they did not examine the entire period, several writers have reached similar conclusions. For example, George H. Hildebrand and Norman V. Breckner in "The Impacts of National Security Expenditures Upon the Stability and Growth of the American Economy," Federal Expenditure Policy for Economic Growth and Stability, Joint Economic Committee, Washington, D.C., 1957, p. 539, found that "A sharp and sustained contraction in security spending, when foreseen, will induce a collateral fall in general activity, with the length of this collateral drop dependent upon the independent strength or weakness of demands in the private sector."

Hickman has also shown that Federal expenditures have revealed the least short-term stability of all major categories of final domestic demand, and that this has primarily been due to national security expenditure fluctuations; see Growth and Stability in the Postwar Economy, op. cit., pp. 208–215.

It should be noted that orders lead expenditures and inventory reactions; cf. Victor Zarnowitz, "The Timing of Manufacturers' Orders During Business Cycles," Business Cycle Indicators, New York, National Bureau of Economic Research, 1961.

fortunately, delve into this matter.[14] Total blame for these downturns, of course, does not rest with the Department of Defense or the Government sector, but orders and expenditure patterns of both groups certainly have not always been stabilizing in the post-World War II era.

TABLE 1.—*Department of Defense net expenditures and obligations for procurement and research, development, test and evaluation, compared with changes in unfilled orders and inventories in the durable goods manufacturing industries*

[Billions of dollars]

| Fiscal year | Department of Defense net expenditures for procurement, research, development, test and evaluation | Defense obligations for procurement, research, development, test and evaluation | Manufacturing durable goods industries | |
|---|---|---|---|---|
| | | | Quarterly changes in unfilled orders | Quarterly changes in inventories |
| Fiscal year 1951, total | 4.74 | 22.96 | | |
| 1st quarter | .76 | 3.72 | | |
| 2d quarter | .85 | 3.95 | +4.12 | +1.84 |
| 3d quarter | 1.33 | 7.83 | +18.04 | +1.48 |
| 4th quarter | 1.80 | 7.46 | +7.12 | +1.92 |
| Fiscal year 1952, total | 12.64 | 30.21 | | |
| 1st quarter | 2.15 | 6.19 | +4.54 | +1.40 |
| 2d quarter | 2.66 | 5.80 | +2.26 | +1.25 |
| 3d quarter | 3.41 | 7.25 | +3.67 | +1.13 |
| 4th quarter | 4.43 | 10.97 | +3.55 | −.13 |

[14] Hearings before the Subcommittee on Defense Procurement, Joint Economic Committee, U.S. Congress, June 12, 1961.

In an earlier set of hearings before the Joint Economic Committee on the Economic Report of the President, 1961, held during the same year, Charles J. Hitch, Assistant Secretary of Defense and Comptroller of the Department of Defense, testified that (pp. 614–668), "Although the Defense Department is conscious of the impact its programs have on the economy, our primary concern, of necessity, is with military requirements. * * * The acceleration and expansion of certain defense programs which will result from the recommendations of the President will, of course, contribute to the general level of economic activity. But this contribution is a byproduct, and not an end in itself.

"There is one other way in which the Defense Department, at the request of the President, has recently responded to the needs of the current economic situation. * * * We have sought, wherever feasible and sensible, to accelerate the placement of contracts for programs already approved. In this case, however, we are simply buying the same things, or doing the same things, somewhat earlier than had originally been planned.

"But even here the Defense Department is quite limited in what it can prudently do. 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 need."

Subsequent discussion between Mr. Hitch and Senator Proxmire explored these issues, the end result being one in close agreement with the views expressed by Paul Samuelson that "Defense expenditures ought to be determined on their own merits. They are not to be the football of economic stabilization. Nor, as was so often done in the past, ought they to be kept below the optimal level needed for security because of the mistaken notion that the economy is unable to bear any extra burdens." Hearings, pp. 723–761.

While Samuelson's views, and those of Hitch and Proxmire, are considered basically correct, certainly one should not go so far as to say that the cyclical and growth implications of DOD expenditures should be ignored. The economic impact of defense programs is of vital concern because the economic health of the Nation may be as important to its chances of long-run survival as the number of missiles in the arsenal. If the "war" with the Soviet Union is truly one of an economic nature, as seems more and more the case, then the Government had best see to it that we consciously mobilize all our resources and not permit any Government agency the luxury of ignoring the effect of its decisions on economic growth and stability. Any trade-offs between the particular aims of one agency and the total objectives of the Nation should be made consciously, rather than implicitly by sweeping them under the rug and then suffering the consequences. If, in fact, any conflicts in goals are made explicit, then, perhaps, corrective countervailing actions can be taken in advance and the deleterious consequences avoided or mitigated.

These matters received some consideration both in the Hearings and the Report of the Subcommittee on Fiscal Policy, Federal Expenditure Policy for Economic Growth and Stability, Joint Economic Committee, Washington, D.C., Nov. 18–27, 1957, pp. 201–233 and 352–384, and Jan. 23, 1958. The question whether one should view the stability effects of a program as well as its basic merits and social priority was discussed. David Novick indicated that difficulties might be encountered in altering defense expenditures due to the long lead times of weapons systems (Hearings, pp. 378–383). Nevertheless, the committee in its report cited the need for introducing flexibility in Government expenditure programs. Furthermore, one of its conclusions was that "Budgetary procedures should provide an objective analysis of the likely effects of Federal programs on the overall level of economic activity, employment, prices and opportunities for and limitation upon investment and other growth-generating activities in the private and State and local sectors of the economy" (Report, p. 14). Only if such a policy is adhered to—on an aggregate, sectoral, and regional basis—can the Nation achieve the optimum utilization of its human and natural resource potentials.

TABLE 1.—*Department of Defense net expenditures and obligations for procurement and research, development, test and evaluation, compared with changes in unfilled orders and inventories in the durable goods manufacturing industries*—Continued

[Billions of dollars]

| Fiscal year | Department of Defense net expenditures for procurement, research, development, test and evaluation | Defense obligations for procurement, research, development, test and evaluation | Manufacturing durable goods industries | |
|---|---|---|---|---|
| | | | Quarterly changes in unfilled orders | Quarterly changes in inventories |
| Fiscal year 1953, total | 18.54 | 20.21 | | |
| 1st quarter | 3.71 | 8.89 | +3.75 | −.41 |
| 2d quarter | 4.63 | 3.84 | −1.94 | +1.03 |
| 3d quarter | 4.63 | 4.45 | +.40 | +1.03 |
| 4th quarter | 5.56 | 3.03 | −2.34 | +.63 |
| Fiscal year 1954, total | 17.34 | 5.58 | | |
| 1st quarter | 4.61 | .86 | −6.56 | +.11 |
| 2d quarter | 4.18 | .42 | −7.62 | +.08 |
| 3d quarter | 4.44 | 1.12 | −4.92 | −.64 |
| 4th quarter | 4.11 | 3.19 | −5.20 | −1.03 |
| Fiscal year 1955, total | 14.36 | 10.93 | | |
| 1st quarter | 3.29 | 2.50 | −1.94 | −1.16 |
| 2d quarter | 3.72 | 4.49 | −.92 | +.68 |
| 3d quarter | 3.84 | 1.68 | +2.01 | +.06 |
| 4th quarter | 3.51 | 2.26 | +.53 | +.23 |
| Fiscal year 1956, total | 13.67 | 14.45 | | |
| 1st quarter | 4.40 | .82 | +3.04 | +.95 |
| 2d quarter | 3.29 | 3.28 | +3.71 | +1.29 |
| 3d quarter | 3.27 | 4.52 | +2.28 | +1.20 |
| 4th quarter | 3.72 | 5.83 | +1.69 | +.89 |
| Fiscal year 1957, total | 15.34 | 16.19 | | |
| 1st quarter | 3.01 | 4.13 | +3.15 | +.69 |
| 2d quarter | 3.96 | 4.44 | +.53 | +1.21 |
| 3d quarter | 4.04 | 3.98 | −.67 | +.85 |
| 4th quarter | 4.33 | 3.65 | −3.18 | +.24 |
| Fiscal year 1958, total | 16.42 | 18.71 | | |
| 1st quarter | 3.97 | 2.51 | −3.99 | −.44 |
| 2d quarter | 3.96 | 4.33 | −5.05 | −.17 |
| 3d quarter | 3.96 | 5.14 | −3.07 | −.97 |
| 4th quarter | 4.53 | 6.73 | −1.37 | −1.47 |
| Fiscal year 1959, total | 17.14 | 19.51 | | |
| 1st quarter | 3.83 | 3.03 | −.11 | −.95 |
| 2d quarter | 4.46 | 5.81 | +.43 | +.13 |
| 3d quarter | 4.24 | 4.77 | +3.24 | +1.24 |
| 4th quarter | 4.61 | 5.91 | −.27 | +1.10 |
| Fiscal year 1960, total | 17.91 | 17.59 | | |
| 1st quarter | 4.28 | 3.41 | +.87 | −.62 |
| 2d quarter | 4.72 | 4.40 | +.28 | +.66 |
| 3d quarter | 4.41 | 4.05 | −1.85 | +1.80 |
| 4th quarter | 4.51 | 5.72 | −1.78 | +.12 |
| Fiscal year 1961: | | | | |
| 1st quarter | 4.29 | 5.18 | +.18 | −.61 |
| 2d quarter | 4.79 | 4.53 | −1.83 | −.76 |

NOTE.—Department of Defense net expenditures and obligations include: (1) the purchase of major items of equipment such as aircraft, missiles, ships, 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 and 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.

Sources: Hearings before the Joint Economic Committee on the January 1961 Economic Report of the President and the Economic Situation and Outlook, March 1961, pp. 667-668; Survey of Current Business.

Even if the economy were left to its own devices, it would not, of course, embark on a growth pattern devoid of cyclical fluctuations. Endogenous forces, expectational factors and stochastic events, as well as external autonomous elements such as export demand, would all result in business cycles. There are, however, two schools of thought on this point: one (advanced by Darling, Metzler, and Stanback) [15] which maintains that almost all cycles are endogenously produced by inventory accumulation and decumulation processes, and the other (characterized by Duesenberry) [16] which holds that cycles can be endogenously induced, but that autonomous shocks are frequently associated with minor declines and are generally present in major depressions. The post-World War II cycles have not, as yet, been thoroughly examined in any research study in an attempt to determine the extent to which endogenous or exogenous factors were responsible for the patterns experienced.

Although the recessions of the last decade might have occurred even without any exogenous shocks, it is noteworthy that in all three instances Government goods expenditures and orders started to fall, or stopped rising, before the cyclical peak had been reached. Moreover, in every case, such intentions were made widely known (thus lowering sales expectations on a broad scale), and taxes were not reduced to compensate fully for lowered Government demand.[17] While one might maintain that the declines of 1953, 1957, and 1960 had their origins in inventory reversals, the conclusion that other factors, especially Government fiscal policy, were critical for cyclical developments appears inescapable.[18]

### C. LONG-TERM BEHAVIOR TRENDS

A review of business inventory behavior over the past 40 years reveals that, by and large, inventory fluctuations in relation to changes in output have become less pronounced. The average level of stocks to sales has fallen, as has the inventory-sales reaction coefficient. This trend, though of reduced magnitude, is evident even in the last decade.[19]

The factors that account for this phenomenon are many. There has been a greatly increased awareness of the costs of maintaining inventories and the savings that might be effected by sounder methods of stock control. This has been due, in part, to the broader formal training of business executives in advanced management techniques and the evolution of the techniques themselves. Most corporation

[15] Darling, op. cit.; Lloyd A. Metzler, "The Nature and Stability of Inventory Cycles," Review of Economic Statistics, August 1941; Thomas M. Stanback, Jr., "Postwar Cycles in Manufacturers' Inventories," Inventory Fluctuations and Economic Stabilization, Part I, Joint Economic Committee, U.S. Congress, Washington, D.C. 1961.

[16] James S. Duesenberry, "Business Cycles and Economic Growth," New York, McGraw-Hill, 1958.

[17] For example, few Government contractors who were active at the time will ever forget the en masse telegram termination of contracts in 1957, and the economy statements of the administration in that year. In a certain sense, the advent of Sputnik in late 1957 might be considered a fortuitous event, because, given the excesses of the plant and equipment boom of 1955–56, a much more severe recession might have been experienced had not the cutback in military programs been reversed and Government defense expenditures and orders rapidly increased in response to the Russian space effort.

[18] A recent statement of the Committee for Economic Development supports this view. See: Committee for Economic Development, "Fiscal and Monetary Policy for High Employment," 1962, pp. 54–56; also, Bert G. Hickman, "Growth and Stability in the Postwar Economy," op. cit., p. 100 and p. 141.

[19] Manufacturing inventories increased fivefold from 1939 to 1961, while sales grew sixfold. The overall manufacturing and trade inventory-sales ratio has also fallen, although, due to growing decentralization as represented by the movement from the central core area to shopping centers, the department store component has risen. Conclusions derived from: Business Statistics, 1961; Elmer C. Bratt, "Availability and Reliability of Inventory Data Needed to Study Economic Change," Inventory Fluctuations and Economic Stabilization, Part III, Joint Economic Committee, U.S. Congress, Washington, D.C., 1961; and Mabel A. Smith, "Factors Influencing Manufacturers' Inventories," Analysis of Business Inventory Movements in the Postwar Period, Part I, directed by Louis J. Paradiso, ibid.

managers today have been exposed to or are familiar with modern inventory control methods and are aware of the benefits which can be derived by their implementation. Although 15 years ago the technique had not even been discovered, linear programming inventory location solutions have been fairly widely adopted by major firms, and will find increasing acceptance among others. This is evidence (although much remains to be done) that inventory control has become an important management concern.

The primary cause of the reduction of inventory stocks and volatility, however, has been the firms' utilization of improved communications and transportation methods and facilities. The communications lag has been practically reduced to the human inertia level, while the transportation lag, for most items, is only a matter of, at most, 2 or 3 days. Production lead times, too, have been cut so that items that are out of stock can be ordered and obtained more rapidly than formerly was the case.

Most striking in the past few years, of course, has been the adoption of large-scale computers and data processing equipment for the internal bookkeeping that is an indispensable requisite of effective inventory control. Most of these installations are of the digital type, which process punched card information on a periodic basis (daily or every few hours) and then spew out reports on the quantity of stock on hand, by item, and also, perhaps, on economical order quantities. This still involves a communications lag since the necessary information on part usage is first recorded by a stock clerk, then punched into a data card, and subsequently batch processed. Some analog systems, however, have been so designed that at every moment they reveal the quantity and approximate location of every part for which such fine control is desired. Remote recording units are tied directly into the computer at usage points to effect instantaneous control.

One might question whether such elaborate systems are economically justified and whether adoption of these techniques will ever become widespread. On both counts the answer is affirmative. Improper maintenance of inventory stock levels is costly from all aspects. Aside from other storage costs, the excess stock accumulated ties up vital working capital in an unproductive use and also frequently must be modified or written off due to technological obsolescence. In sectors where the product development or alteration rate is rapid (for example, drugs, consumer style goods, and certain producer and consumer hard goods), obsolescence is particularly important and is causing many firms to survey critically their inventory control procedures in an effort to curtail inventory losses.

This process of more rigid control will be aided in the future by relatively (in terms of the savings to be reaped) inexpensive remote data feeders for digital or analog computation equipment. Although the units now on the market will perform satisfactorily, they are still far too costly and have not been widely adopted. Spurred by advances in the business equipment field, inventory control should witness a revolution in the next 5 to 10 years.

In terms of economic stability, this means that the trend in the fall of average stock levels in relation to sales will continue. Inventory fluctuations will become less pronounced but their frequency may increase. This will occur because the more sensitive control methods will limit stock accumulation to minimum levels and, thus, inventories

cannot decline greatly when reversals in sales occur. The increased sensitivity, nevertheless, has its drawbacks, since any variations in sales expectations will immediately be reflected in an alteration in desired stock levels and orders for purchased items.

Errors in forecasting sales will also result in a more rapid realinement of inventories to equilibrium levels. In terms of the discussion of the previous section, firms will be less likely to be indifferent to inventory fluctuations in a given range, adjusting stocks only sporadically or periodically. The over or under adjustment of inventories will become less prevalent since the control techniques will present management with accurate desired and actual stock level reports.

Fluctuations in sales expectations, therefore, will be amplified by the inventory reaction. This feedback loop, however, will not generally culminate in either a boom or depression (given initial shocks in those respective directions), since the second order effects will be weaker than the primary effect. This is caused by the fact that other demand forces in the economy will act as a restraining influence and that the sales expectation reaction to changes in inventory accumulation is more sluggish than the inventory reaction to changes in sales expectations.

The more sensitive inventory mechanism has several implications for Government policy and actions in the area of economic stability. These can be subdivided into two major categories—those which have an impact on the reaction coefficients and those which influence the state of demand.

With demand or sales expectations given, actions would have to be taken to alter the costs of inventory accumulation. It may be difficult to devise effective methods of altering inventory reaction rates so as to limit inventory fluctuations, since neither discretionary nor automatic cyclical influences are likely to affect obsolescence, order, interest, or storage costs to any appreciable extent. Nor is ready or limited funds availability, *ceteris paribus*, apt to increase inventory investment in a recession or restrain it in a boom. Schemes to influence accumulation via direct tax credit measures may prove expensive, both in terms of dollar cost and in the misallocation of resources into inventories that would not subsequently be used.

On the demand side, the picture is mixed. Any alteration in Government demand for goods will rapidly be reflected in inventories. Thus, countercyclical orders and spending will have the desired effect. At the same time, errors in monetary and fiscal policy management will be magnified to a greater extent than they are today, hindering the achievement of the stability goal. Ideally, miscalculation in Government action can be kept to a minimum and a positive balance in Government impact on stability attained.

### D. CONCLUSION

Inventory accumulation in the economy is basically determined by the various cost factors of ordering, production changeover, obsolescence, inventory control, opportunity costs of funds availability and satisfying customer demand, and sales expectations. The accumulation forces, in the short run, are linked primarily to the last named variable in a structural process which exhibits a certain degree of inertia and a tendency toward overreaction when significant depar-

tures of sales from their growth path "trend" occur. In the long run, the application of more sensitive inventory control methods will result in the continued decline of inventory-sales ratios and a reduction in the amplitude of inventory fluctuations. The increased sensitivity, however, will cause a greater responsiveness of inventories to changes in expected demand and a higher frequency of inventory reversals. Therefore, the possibilities for future Government intervention in terms of an alteration of inventory-sales reaction coefficients will be reduced. Countercyclical demand policies will have a greater impact, however, thus enabling significant reductions in inventory fluctuations if Government actions are directed intelligently and accurately.

## III. Aggregate Impact of Inventory Behavior

In order to measure the impact of alternative patterns of inventory fluctuation, a dynamic, empirical, quarterly model of the U.S. economy was constructed.

### A. CHARACTERISTICS OF THE MODEL

The model seeks to reflect the impact of the automatic stabilizers, the relationship of personal consumption expenditures to disposable income, the additions to the nonfarm residential housing stock, and business investment in equipment, construction, and inventories. An endeavor was made to keep the simulation system simple, reasonably realistic, and, as far as possible, wholly self-contained. All private demands, taxes, and transfers are generated within the system. Thus, all of the variables are endogenous, with the exception of population, the inventory price deflator and valuation adjustment, the sales-of-goods price deflator, statistical discrepancy, excess of wage accruals over disbursements, subsidies less current surplus of Government enterprises, farm inventory investment, exports and Government purchases of goods and services. A GNP potential variable is also exogenous.

The level of aggregation of the model follows the national income accounts of the Department of Commerce and the format of the tabulated results presented below generally conforms to the tables in U.S. Income and Output and the July issue of the Survey of Current Business. The system was fitted over the years 1953–60 by the single equation least squares technique and is recursive, each current period ($t$) being generated by initial values in $t-1$ (and other previous quarters) and structural relations which relate the past and current periods.[20] A shorter time interval may have been desirable in several of the equations, especially the inventory relation, but unfortunately the requisite data to perform the herculean feat of constructing a monthly business cycle model are not available. Within-quarter averaging obscures some of the extreme fluctuations in certain key variables but sufficient variation remains so that a quarterly model can depict much of the dynamics of business cycle movements.

[20] Theoretically, the recursive properties of the system eliminate any simultaneous equation bias. A high degree of serial correlation in various of the series, however, precludes the existence of this ideal state. Nevertheless, the deviation is not felt to be serious.

The model, with one notable exception, is built up of variables in monetary rather than real terms. Generally, because most behavior in the economy is based on real rather than monetary factors, relationships which abstract from price changes tend to be more stable than those expressed in current values. From the standpoint of attempting to keep the number of equations estimated to a minimum and reducing the need for exogenous price inputs, it is desirable, however, to attempt to ignore the real versus monetary distinction whenever the theoretical deviation in behavior is not too rank. For example, consumption functions in monetary as opposed to real terms should not deviate too markedly from each other if price movements are cyclically sluggish. In fact, when a comparison of several sets of consumption functions (one in real terms, the other in monetary) was made, there was no significant difference in the coefficients of the terms of the matching equations.

It is also true, of course, that some relationships are more stable in monetary than real terms. In particular, taxes and transfers are a function of current dollar values. Personal income taxes rise whenever personal income increases, the revenue increase being independent of whether a rise in personal income is real or merely the result of inflation. In some other relations, too, even though the primary causal chain is based on real phenomena, monetary factors play an independent role. This is true in the case of business investment for plant and equipment where cash throw-off may induce capital expenditures irrespective, within limits, of the real value of the purchased goods.

Real variables do necessarily play a role in the system. Inventory behavior, for example, cannot satisfactorily be explained in current dollar terms. Capacity factors, too, are of a physical nature.

As previously indicated, the inventory deflators are exogenous inputs. The capacity element employed is generated by deflating GNP by an endogenously estimated price series.

The details of the estimation of individual equations are outlined in the following section. Let us, however, explore two critical assumptions here.

First, it is assumed that, by and large, monetary policy over the analysis period has been passive and permissive in the sense of not unduly affecting prices or real demand. In other words, the implication is that the Fed, notwithstanding many machinations, has generally maintained the money supply at levels which cause neither inflationary nor repressive price or demand pressures and also that price changes are largely the result of real factors such as the level of capacity utilization, the rate of acceleration of demand, etc. In a recession situation, increases in the money supply, at best, have only been permissive, allowing an expansion in real demand to become effective. Under boom conditions, monetary policy has had an impact, but whether it alone caused a substantial reduction in demand on an aggregate basis is questionable.

In some areas where demand is particularly sensitive to interest rates (for example, nonfarm residential construction and public utility investment), monetary policy may, however, have a substantial effect. Other selective credit instruments, too, may cause considerable alteration in the pattern of expenditures. Changes in FHA, VA, and FNMA mortgage terms and funds availability have had such an im-

pact (the 1959 boom in house construction is a direct result of the policy of ease adopted in 1958).

Because monetary and selective credit policies were not taken into account, it was expected that during various quarters in the simulation period there would be unexplained residuals. These, in fact, occurred. At some later date the financial and monetary sectors will specifically be included in the model and it is hoped that the deficiencies noted above will be eliminated.

Second, it is assumed that one can define a capacity level of GNP which is independent of the current level of output. The concept is identical to that proposed by the Council of Economic Advisers in their report to the Joint Economic Committee in January 1961.[21] The theoretical capacity level also corresponds, in some degree, with the concepts of warranted and natural growth rates prevalent in economic development theory. On the warranted side, it represents a moderate, reasonable, average rate of real increases in output that the economy could experience if investors, consumers and Government pursued actions to bring such growth about; on the natural side, a certain rate of increase of the labor force, unemployment maintained at frictional levels, and increases in the capital stock consistent with advances in technology and full employment. In essence, the capacity growth rate employed here is one which has the warranted and natural growth rates in equilibrium at some arbitrary level which is consistent with the rate of increase of the labor force and investor and consumer expectations of attainable levels of increased real income.[22]

Failure to achieve the capacity growth rate then has similar consequences as the failure of the warranted to equal the natural growth rate. A state of steadily worsening underutilization (in relation to the potential attainable) may occur, depending upon whether Government actions or stochastic events effect a change in the structural situation and the psychological attitude toward the gap. The underutilization of capacity defined in this manner has certain implications for several variables in the system. These will be discussed when the various functions are considered in detail.

### B. MODEL STRUCTURE AND ITS USE IN SIMULATIONS

The model constructed was utilized in various experiments. Six basic variations were employed for three different recession periods, resulting in 18 experiments in all. In each case, initial conditions for preceding quarters were introduced as inputs and the system was then released to generate the history of the following periods. The exogenous data series previously mentioned and any policy parameters were, of course, also necessary inputs at every stage.

The experiments chosen were as follows:

I. Pseudo-realistic situation: Simulation of the system without any policy alterations.

II. Tax reduction policy: Simulation with a reduction in Federal personal income taxes beginning in the first recession quarter corresponding to the recommendatinons of the Commission on Money and Credit (taxes reduced in the first bracket by 25

[21] Statement of the Council of Economic Advisers, "The American Economy in 1961: Problems and Policies," Hearings before the Joint Economic Committee on the January 1961 Economic Report of the President and the Economic Situation and Outlook, March 1961, p. 333.

[22] Following the Council, a 3½ percent annual growth rate with a base at the annual 1955 level has been assumed.

percent; since collections in this group comprise approximately 75 percent of total revenues, the net total tax reduction is 17.5 percent).[23]

III. Inventory fluctuation reduction policy: In every recession quarter, nonfarm inventory change, in constant dollars, was reduced by 50 percent from the level that would have prevailed had no policy intervention been introduced.

IV. Orders fluctuation reduction policy: In every recession quarter the change in constant dollar, manufacturers' unfilled orders was constrained to 80 percent of the amount that would have prevailed had no policy intervention been introduced.

V. Inventory and orders fluctuation reduction policy: A combination of experiments III and IV.

VI. Alteration in Government expenditures policy: Total Government expenditures and Government goods expenditures were adjusted to conform to a trend connecting their respective values in the previous peak quarter of the three recessions studied with the levels which are expected to be attained in 1963, 2d quarter.

The objective of the simulations was, of course, to determine whether the above policy instruments might have a significant impact on the level of national income in a recession.[24] As such, simulations were run on the 1953–54, 1957–58, and 1960–61 declines. Once having started the system running, however, there was no reason to terminate the iterative process. It would continue its simulation estimates as long as it found the necessary exogenous inputs. Actual values for these were employed through the third quarter of 1961 and estimated values from that point forward.[25] The simulations for all experiments therefore run from 1953, 4th quarter, to 1963, 2d quarter; 1957, 3d quarter, to 1963, 2d quarter; and 1960, 3d quarter to 1963, 2d quarter.

The sequence of operations in deriving the forecast numbers is to start with the consumption functions (which require only previous quarter values) in order to obtain total personal consumption expenditures and expenditures for services. The difference between total and services consumption is consumer expenditures for goods which, when added to the exogenous input of Government goods purchased, the goods component of exports and endogenously estimated producers' durable equipment expenditures less the goods content of imports, forms a current input to the nonfarm inventory equation. Current period business investment in construction and equipment, nonfarm residential construction, and imports are, similarly to consumption, determined from lagged values of various variables. The sum of these demands (consumption, nonfarm inventory investment, business investment, nonfarm residential construction less imports) plus exogenously given exports and Government purchases of goods and services yields the value of GNP. Given GNP, it is then possible

[23] The personal Federal tax variable employed in the simulation lumps together Federal taxes and nontaxes. The latter only account for 2.5 percent of total collections, however, so no adjustment in the tax reduction rate was made.

[24] In principle, the tax and expenditure policies utilized are similar to those outlined in recent administration proposals. See John F. Kennedy, Economic Report of the President, transmitted to the U.S. Congress, January 1962, together with the Annual Report of the Council of Economic Advisers, Washington, D.C., U.S. Government Printing Office, 1962.

[25] Estimates were made for all variables directly, with the exception of exports. Starting with the first quarter of 1962, the net balance on goods and services account (net foreign investment) was assumed to be $1 billion, seasonally adjusted, at annual rates. Therefore, exports automatically were $1 billion greater than imports.

to work back down to consumer disposable income by estimating the impact of the automatic stabilizers, corporate profits, taxes, dividends and retained earnings, and personal taxes. With disposable income known, consumption in the next period $(t+1)$ can be computed, etc.

It would have been desirable to undertake simulations to test the stability properties of the model and check for any bias in the system growth path. This might have been accomplished by the random error technique outlined in a previous paper but, unfortunately, time did not permit a further set of extensive computations.[26] Some information in this regard may perhaps be gleaned from the forecast values generated by the model several years after the initial iteration. If these are significantly close to the actual figures, then one might make the tentative assumption that any net total bias is minimal. This point will, however, receive further treatment below.

### C. SIMULATION OF MACROECONOMIC BEHAVIOR

The results of simulating, under various policy assumptions, each of the three most recent recessions will be discussed in turn below. The emphasis initially will be placed on the analysis of a seven quarter span—previous peak to recession trough quarter and the trough to the quarter six periods after the previous peak. Interest will be focused on the percentage decline in income that might have been averted via the various stabilizing policies. Attention will then subsequently be given to the long-range forecasting accuracy of the model and the long-run consequences of adopting the stabilizing alternatives considered.

#### *1. The 1953–54 recession*

The 1953–54 recession was simulated starting with the fourth quarter (with the third quarter taken as the previous peak).[27] Actual values for national income experience are given in Appendix Tables I–A and I–B; the simulation results for the various experiments in Appendix Tables II–A–1 through II–B–6. As can be seen from a comparison of the actual figures and those of the pseudo-realistic situation (Experiment I), the model portrays this recession rather accurately, although the pattern of decline in GNP does not quite match realized experience. The economy reached a trough in the second quarter of 1954 while the model arrived at the same point in the previous quarter. This is primarily due to the failure to portray accurately the path of actual inventory change and the decline in business investment. Such difficulties will plague the simulations throughout all of the recessions.

It is not necessary that a movement of the simulated economy exactly mirror its real counterpart. The structure of the simulation model must, however, fairly faithfully coincide with the system it purports to depict. Any biases and counterbalancing errors should be minimal. Nevertheless, some degree of inaccuracy can be tolerated if the results are interpreted only in the light of orders of magnitude within a range, rather than as explicit point estimates. Given a linear system of equations (the economy model is basically linear) it is possible to

[26] James S. Duesenberry, Otto Eckstein and Gary Fromm, "A Simulation of the U.S. Economy in Recession," Econometrica, October 1960, pp. 773–775.

[27] Actually the recession began a quarter earlier, but data limitations prevented a third quarter simulation starting date. The difference between the second and third quarters is not marked, however (−$1.7 billion in GNP, seasonally adjusted, at annual rates); the big drop in income occurred in the fourth quarter.

determine proportionate effects of various stabilization policy instruments and then extend these percentage offsets to the real world. In other words, a 25 percent offset in the decline of GNP in the model is presumed to also be approximately attainable if the policy measures were actually implemented.

Table 2 shows a summary of the actual and experimental GNP movements for 1953, third quarter, to 1955, first quarter. Also presented are the peak-to-trough and trough-to-1955, first quarter, offsets in GNP which are the results of the various policies. Actual GNP fell by $8.2 billion, peak to trough, and rose by $25.4 billion while the corresponding numbers for experiment I were $8.5 billion and $23.4 billion, which represents an excellent fit except for the slight difference in timing.

TABLE 2.—*Gross national product summary: 1953–54 recession*

[Seasonally adjusted at annual rates]

| Item | Actual | Experiment | | | | | |
|---|---|---|---|---|---|---|---|
| | | I. Pseudo-realistic | II. Tax reduction | III. Inventory fluctuation reduction | IV. Orders fluctuation reduction | V. Inventory and orders fluctuation reduction | VI. Altered Government expenditures pattern |
| Gross national product (billions of current dollars): | | | | | | | |
| 1953: | | | | | | | |
| 3d quarter | 367.1 | 367.1 | 367.1 | 367.1 | 367.1 | 367.1 | 367.1 |
| 4th quarter | 361.0 | 364.2 | 364.2 | 365.3 | 364.2 | 365.3 | 363.9 |
| 1954: | | | | | | | |
| 1st quarter | 360.0 | 358.6 | 362.8 | 361.2 | 359.5 | 361.7 | 365.0 |
| 2d quarter | 358.9 | 359.4 | 363.4 | 361.9 | 360.8 | 362.6 | 377.1 |
| 3d quarter | 362.0 | 365.6 | 368.5 | 367.1 | 367.0 | 367.8 | 388.8 |
| 4th quarter | 370.8 | 373.4 | 375.4 | 373.1 | 374.2 | 373.6 | 399.6 |
| 1955: 1st quarter | 384.3 | 382.0 | 383.8 | 380.4 | 381.9 | 380.5 | 407.4 |
| Change in gross national product (billions of current dollars): | | | | | | | |
| Peak to trough | −8.2 | −8.5 | −4.3 | −5.9 | −7.6 | −5.4 | −2.1 |
| Trough to 1955, 1st quarter | 25.4 | 23.4 | 21.0 | 19.2 | 22.4 | 18.8 | 42.4 |
| Stabilization offset [1] (percent): | | | | | | | |
| Peak to trough: | | | | | | | |
| Difference | | | 49.4 | 30.6 | 10.6 | 36.5 | 75.3 |
| Integral | | | 49.4 | 43.5 | 10.6 | 49.4 | 71.8 |
| Peak to 1955, 1st quarter: | | | | | | | |
| Difference | | | −12.1 | 10.7 | .7 | 10.1 | −170.5 |

[1] Stabilization offsets are the changes in gross national product which might have been averted had the policy measures cited been instituted. Peak-to-trough offset is the change in gross national product for experiment I less the change in gross national product for any other experiment, divided by the change in gross national product for experiment I. The difference is for peak-and-trough values, while the integral also includes the sum of the differences of the intermediate values of gross national product. Peak-to-1955, 1st quarter, offset is the difference between gross national product of experiment I and any other experiment, divided by the change in gross national product of experiment I from the peak to 1955, 2d quarter.

This is to be anticipated. In any simulation of the economy, a model should, normally, be "inside" the variation that actually takes place, because the expectations of individuals and firms (and their resulting impact on behaviors) cannot be fully taken into account. Even if expectations are explicitly introduced into the structural equations as explanatory variables, they cannot be generated satisfactorily by a set of proxy terms or direct estimation. Expectations are partially rational (to this degree perhaps they can be explained by real variables—levels and rates of change) and partially irrational.

The irrational component is a function of accumulated past experience and whatever stochastic factors (e.g., foreign affairs, weather, etc.) seem important at the moment. Thus, taking these two expectational elements together generally means that the economy lags its structural factors on a downturn and leads them on an upturn—both in timing and in magnitude. Recessions last somewhat longer and are more severe than conditions warrant, and booms, when they start, accelerate with high velocity and are stronger than is justified by foreseeable levels of sustained capacity utilization. That is not to say that high levels of capacity utilization and rapid economic growth are not attainable. These, however, require Government actions (this does not necessarily mean direct intervention) that promote stable growth rather than measures which aid short-term cyclical stability but inhibit long-term growth.

As to the results of the stabilizing instruments employed in the simulation of the 1953–54 recession, the most powerful, in terms of offsetting the potential decline in GNP, was the increase in Government expenditures. This policy held the fall in GNP to $2.1 billion (a stabilization offset of 75 percent) while tax reduction and modified inventory behavior limited it to $4.3 billion and $5.9 billion (stabilization offsets of 49 percent and 31 percent), respectively. Stabilizing the change in unfilled orders by 20 percent was generally ineffective, but did reap a somewhat greater gain for a combination of the inventory and orders policies.

The magnitude of the stabilization policies employed was, of course, arbitrary, although it was felt that they were of reasonable and attainable magnitudes. In terms of the marginal gain per dollar of input for downside GNP stabilization, the tax policy, in the short run, is most expensive, yielding $0.72 per dollar of tax reduction, while the inventory policy payoff is $1.03 per dollar of inventory reduction avoided, and the expenditure increase has a return in additional GNP of $1.11 per dollar spent.[28] These values do not imply that the expenditure policy is preferred to the inventory policy which, in turn, is more desirable than tax reduction as a means of stabilizing income. Although tax reduction stabilization is costly in the short run, it does have certain advantages—e.g., its impact is certain; the effects are calculable; there is no misallocation of resources; the consumer benefits directly; it is simple to administer; and, in the long run, it may stimulate sufficient growth to more than pay for itself. The expenditure policy has many of the same attributes, although in the allocation of resources and direct consumer benefits its advantages may not be as significant.

On the other hand, the inventory measure also has a unique superiority in its immediate impact, with no time lags and low requirements for additional Government expenditures or tax rebates. The ultimate choice of a stabilization instrument depends on many factors and can only be made after weighing all the costs, gains, and other intangibles

[28] The respective GNP multipliers here are 3.8, 1.03, and 1.11. The marginal propensity to consume the tax reduction is 0.58, which then yields a consumption multiplier of 2.4. In light of a permanent income hypothesis this seems quite reasonable. The short-run tax and expenditure multipliers are lower than their long-run values because there is insufficient time for the income generation feedbacks to work themselves out. In the long run, they should, and do, approach the consumption multiplier. The long-run consumption multiplier, as one might surmise, is higher, and the consumption GNP multiplier is lower, than in the short run. In the short run, consumers do not adjust fully to the increase in income and they expend a lesser fraction of any immediate gain than is the case if the higher income level is sustained. The initial spurt in short-run consumption, however, has the effect of raising the demand for goods, especially durables, thus helping to limit inventory disinvestment and raise GNP. In the long run, although consumption is increased, the inventory effect is reduced, thus lowering the consumption GNP multiplier.

(including administrative lags and political pressures) of various policy measures.

In this regard some interest also should be centered on the recovery impact of the stabilizing instruments, since political considerations often result in the inability or unwillingness to terminate a discretionary stabilizer. If the measures instituted are directionally symmetrical in their effects on the economy, then in the recession phase income is buoyed above otherwise prevailing levels, and in the recovery phase it is restrained. Conversely, a directionally asymmetric stabilizer will always exert its forces toward raising or lowering income. Thus, although reducing inventory fluctuations by 50 percent when GNP falls from its previous peak helps to sustain output, after the trough has been reached a limitation on inventory investment prolongs and restricts the recovery. If the economy has a tendency to cycle near capacity in fluctuations of high frequency and amplitude, then this damping may be desirable. In contrast, if the cycles occur at a point well below the point of output limitation, the impedance to recovery may be considered detrimental. The varying amounts of restraint resulting from the application of the simulation policy alternatives are recorded in Table 2. The tax reduction policy raises the increase in GNP from 1953, 3d quarter, to 1955, 1st quarter, by 12 percent while the inventory stabilizer reduces it by 11 percent. The expenditure policy raises it by 170 percent. How one views these figures depends, in part, on his particular orientation toward price level stability, cyclical fluctuations, and economic growth. Given the fact that 1955 was a year in which the economy was operating near its capacity, the added impetus resulting from the tax cut might be viewed as destabilizing. On the other hand, if the high level of economic activity could have been maintained by these means, perhaps any consequent price pressures would have been justified.

*2. The 1957–58 recession*

The economy actually slipped gradually away from its capacity peak of 1955 in 1956, and entered 1957 with a business investment boom which prevailed throughout three-quarters of the year. The capital invested, however, exceeded immediate demand requirements and thus, when Federal orders and purchases were curtailed for budgetary reasons, a reaction set in, helping to cause the recession of 1958. Activity turned down in mid-1957 and reached its recession trough in early 1958. The simulation of this period traces a similar pattern, but does not reach the depths that the economy experienced. This may be attributed primarily to a failure of inventories and business investment to fall as markedly in the model as they actually did.

The patterns of the GNP declines for the various experiments are shown in Table 3. (A complete tabulation of results may be found in Appendix Tables III–A–1 to III–B–6.) Whereas actual GNP fell by $15.4 billion, peak to trough, that in the pseudo-realistic experiment declined by $3.8 billion. Nevertheless, the stabilization offsets of the policy instruments, with the exception of the tax cut and expenditure alteration measures, are nearly identical for the 1953–54 and 1957–58 recessions. Tax reduction is more powerful in the later years because the response of consumption and the amount of inventory decumulation avoided are somewhat greater than before. By the first quarter of 1958, the tax cut measure returns income to $1 billion greater than

its previous peak level. The inventory policy results in a stabilization offset of 29 percent; the orders policy, 16 percent; and the combination of orders and inventories, 40 percent. The concordance of these figures with those of the 1953–54 recession is taken as evidence of their reliability, and their interpretation parallels that presented above.

TABLE 3.—*Gross national product summary: 1957–58 recession*

[Seasonally adjusted at annual rates]

| Item | Actual | Experiment | | | | | |
|---|---|---|---|---|---|---|---|
| | | I. Pseudo-realistic | II. Tax reduction | III. Inventory fluctuation reduction | IV. Orders fluctuation reduction | V. Inventory and orders fluctuation reduction | VI. Altered Government expenditures pattern |
| Gross national product (billions of current dollars): | | | | | | | |
| 1957: | | | | | | | |
| 3d quarter | 448.3 | 448.3 | 448.3 | 448.3 | 448.3 | 448.3 | 448.3 |
| 4th quarter | 442.3 | 445.5 | 445.5 | 446.3 | 445.5 | 446.3 | 446.0 |
| 1958: | | | | | | | |
| 1st quarter | 432.9 | 444.5 | 449.3 | 445.6 | 445.1 | 446.0 | 444.2 |
| 2d quarter | 437.2 | 450.4 | 455.3 | 451.0 | 451.4 | 451.6 | 449.4 |
| 3d quarter | 447.0 | 460.4 | 464.1 | 459.8 | 461.4 | 460.3 | 457.7 |
| 4th quarter | 460.6 | 471.1 | 473.4 | 469.1 | 471.5 | 469.4 | 467.8 |
| 1959: 1st quarter | 472.2 | 475.6 | 477.4 | 472.8 | 475.3 | 472.8 | 473.6 |
| Change in gross national product (billions of current dollars): | | | | | | | |
| Peak to trough | −15.4 | −3.8 | +1.0 | −2.7 | −3.2 | −2.3 | −4.1 |
| Trough to 1959, 1st quarter | 39.3 | 31.1 | 28.1 | 27.2 | 30.2 | 26.8 | 29.4 |
| Stabilization offset [1] (percent): | | | | | | | |
| Peak to trough: | | | | | | | |
| Difference | | | 126.3 | 28.9 | 15.8 | 39.5 | −7.9 |
| Integral | | | 126.3 | 50.0 | 15.8 | 60.5 | 5.3 |
| Peak to 1959, 1st quarter: | | | | | | | |
| Difference | | | 6.6 | 10.3 | 1.1 | 10.2 | 7.3 |

[1] Definitions similar to Table 2.

The expenditure policy, however, results in a highly different response in the later recession, but this is due to a difference in expenditure amounts and patterns. In the 1953–54 recession, increased total expenditures over those which actually occurred followed a quarterly sequence of $0.2 billion and $5.3 billion, and goods expenditures one of $0.1 billion and $1.8 billion; while in 1957–58, total expenditures were increased by $0.7 billion and $0.2 billion and goods expenditures fell $0.3 billion and $1.9 billion.[29] Therefore, the resulting direct contribution was lower in the second recession, and the inventory impact was negative. Nevertheless, this simulation experiment does indicate the strong dependence of economic stability on the actions of Government. For downward stability, there must be provision not only for increased total expenditures, but also for levels of Government goods outlays which do not contribute to negative inventory accumulation. For example, the positive effect of a $1 billion increase in total Government expenditure is balanced (in terms of a net zero contribution to GNP) in the current period by a $2.2 billion decline in goods expenditures (and a $3.2 billion increase in services). This arises because of the negative impact on inventory investment of the goods expenditure cutback.

[29] It should be recalled that the expenditure policy measure employed is one which allows for the total and goods component of Government expenditures to increase from their previous peak value to 1963, 2d quarter, on a linear trend basis.

TABLE 4.—*Gross national product summary: 1960–61 recession*

[Billions of current dollars; seasonally adjusted at annual rates]

| Item | Actual | Experiment | | | | |
|---|---|---|---|---|---|---|
| | | I. Pseudo-realistic | II. Tax reduction | III. Inventory fluctuation reduction | IV. Orders fluctuation reduction | V. Inventory and orders fluctuation reduction |
| Gross national product: | | | | | | |
| 1960: | | | | | | |
| 2d quarter | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 |
| 3d quarter | 505.1 | 503.9 | 503.9 | 503.3 | 503.9 | 503.3 |
| 4th quarter | 504.5 | 507.5 | 513.0 | 506.9 | 507.6 | 507.0 |
| 1961: | | | | | | |
| 1st quarter | 500.8 | 516.4 | 522.0 | 514.6 | 516.7 | 514.7 |
| 2d quarter | 516.1 | 520.4 | 524.3 | 519.4 | 520.6 | 519.6 |
| 3d quarter | 525.8 | 527.2 | 529.5 | 525.9 | 527.1 | 526.1 |
| 4th quarter | 542.2 | 536.3 | 538.2 | 534.6 | 536.0 | 534.7 |
| Change in gross national product: | | | | | | |
| Peak to trough | −5.6 | −2.5 | −2.5 | −3.1 | −2.5 | −3.1 |
| Trough to 1961, 4th quarter | 41.4 | 32.4 | 34.3 | 31.3 | 32.1 | 31.4 |

*3. The 1960–61 recession*

In this period, unfortunately, the simulation model does not yield results which can be employed to confirm the previous analysis. The simulated economy does experience a downturn (see Table 4), but it is extremely short-lived, lasting only a quarter. Several factors may explain the discrepancy. First, although some decline in output should have occurred given the structural and exogenous forces at work, the drop in income (though extremely small anyway) was actually more severe than appears justified from a review of the demand potential available. Extreme caution, engendered by expectational elements, in inventory accumulation and personal consumption expenditures played a major role in the cutback. Consumption in the 1960–61 recession exhibited a pattern of behavior which it had not shown in any prior year, falling in the third quarter from its previous peak of the second quarter of 1960, rising to a new high in the fourth, and then dropping again in the first quarter of 1961. This tends to indicate the possibility, secondly, that the Department of Commerce data may be in error and that subsequent revisions (which forever plague the econometrician) will reveal different magnitudes than those currently published. Finally, the model, of course, cannot always be exact, and may well be inaccurate.

Since it requires two quarters for the tax and orders fluctuation reduction policies to evidence an effect (changes taking place in the first quarter are felt in the second), and since inventory accumulation must be negative in order to realize a saving from restraining inventory investment, no knowledge is gained here as to the stabilization impact of the various policies. Any cyclical stabilization inferences must be drawn from the simulations of the earlier recessions.

*4. Long-run stabilization policy impact*

Although prime concern may center on the ability of the stability instruments to mitigate recessions, some thought should also be given to their long-range effects. This is particularly essential if the measures are instituted (supposedly on a temporary basis) and then never repealed. The important question is whether or not the stabilizers have an adverse effect on economic growth. If so, any policy implementation that does not prescribe removal at an optimal point should be viewed with suspicion.

A consideration of the long-run stabilization policy impact should be preceded, however, by a check on the long-term forecasting accuracy of the simulation system. Figures 1, 2, and 3, and Table 5 reveal that the model employed in this paper yields a fairly good prediction of the movements of GNP of the economy, both in terms of cyclical variability and long-term growth. In a certain sense, this is to be expected. A set of equations which are fitted to a given period and individually show a high degree of explained variance should, normally, yield summed behavior which conforms closely to aggregate economic activity for that time span. Nevertheless, it cannot be tacitly assumed, given the stated conditions, that an accurate GNP prediction is assured. Interactions of the different relations may result in a significant bias. Even without such bias (i.e., GNP is accurately predicted) large compensating errors may counteract each other, negating the structural validity of the system. The only true test of a model would be a lack of major compensating errors and accurate predictions, independent of the starting date for simulation iterations, beyond the final quarter of the model construction period.

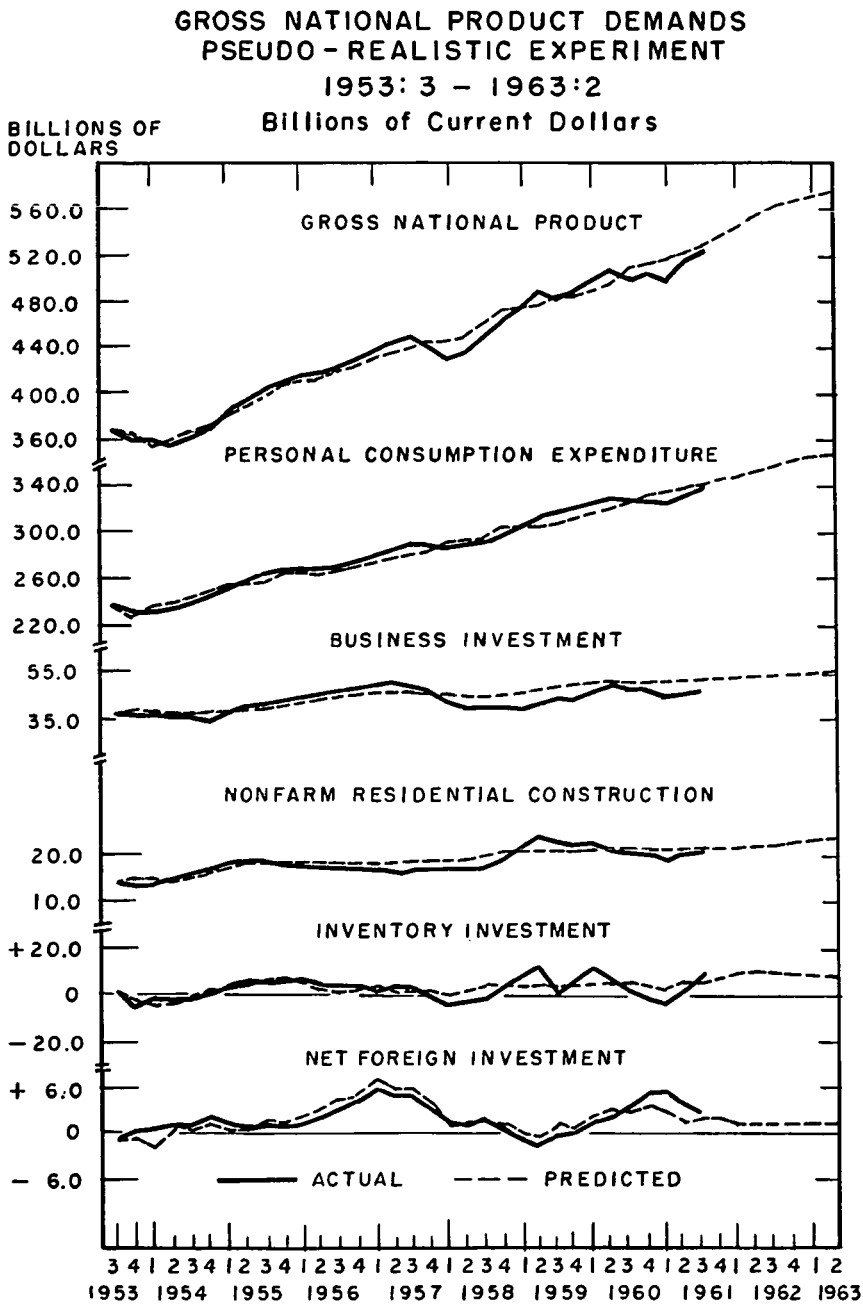
GROSS NATIONAL PRODUCT DEMANDS
PSEUDO-REALISTIC EXPERIMENT
1953:3 – 1963:2
Billions of Current Dollars
BILLIONS OF DOLLARS
560.0
520.0
480.0
440.0
400.0
360.0
GROSS NATIONAL PRODUCT
340.0
300.0
260.0
220.0
PERSONAL CONSUMPTION EXPENDITURE
55.0
35.0
BUSINESS INVESTMENT
20.0
10.0
NONFARM RESIDENTIAL CONSTRUCTION
+20.0
0
−20.0
INVENTORY INVESTMENT
+ 6.0
0
− 6.0
NET FOREIGN INVESTMENT
ACTUAL
PREDICTED
3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963

FIGURE 1

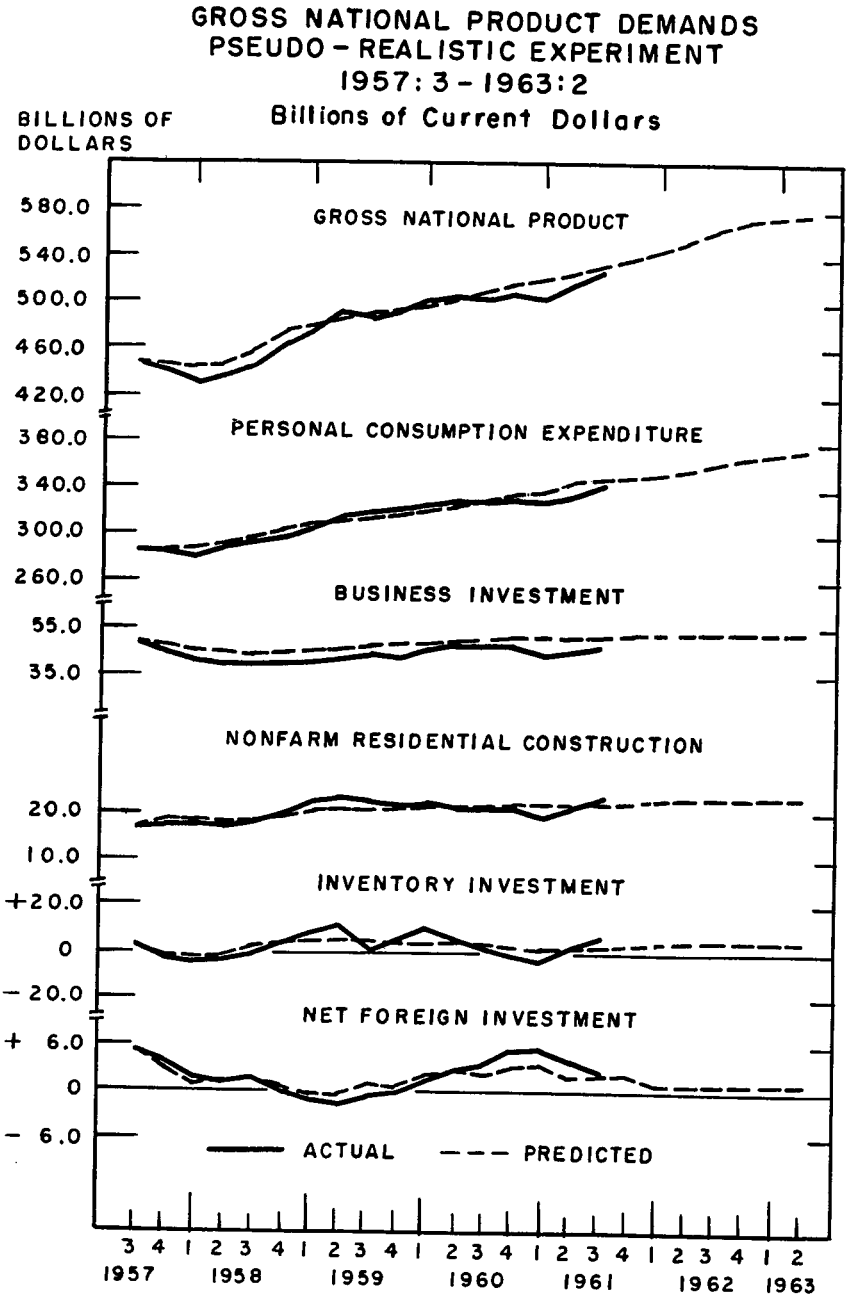
GROSS NATIONAL PRODUCT DEMANDS
PSEUDO - REALISTIC EXPERIMENT
1957: 3 - 1963: 2
Billions of Current Dollars
BILLIONS OF DOLLARS
580.0
540.0
500.0
460.0
420.0
380.0
340.0
300.0
260.0
55.0
35.0
20.0
10.0
+20.0
0
- 20.0
+ 6.0
0
- 6.0
GROSS NATIONAL PRODUCT
PERSONAL CONSUMPTION EXPENDITURE
BUSINESS INVESTMENT
NONFARM RESIDENTIAL CONSTRUCTION
INVENTORY INVESTMENT
NET FOREIGN INVESTMENT
ACTUAL
PREDICTED
3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2
1957
1958
1959
1960
1961
1962
1963

FIGURE 2

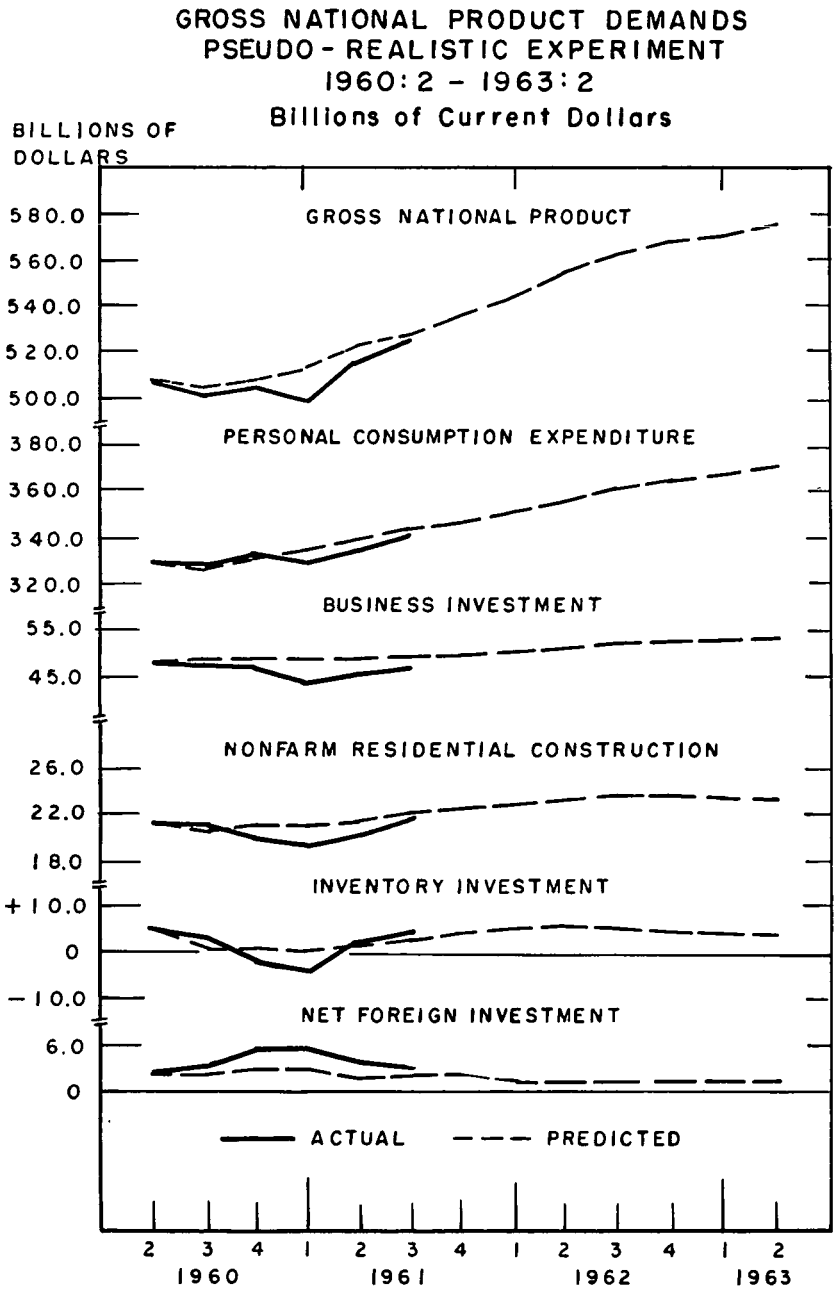
GROSS NATIONAL PRODUCT DEMANDS
PSEUDO-REALISTIC EXPERIMENT
1960:2 - 1963:2
Billions of Current Dollars
BILLIONS OF DOLLARS
GROSS NATIONAL PRODUCT
580.0
560.0
540.0
520.0
500.0
PERSONAL CONSUMPTION EXPENDITURE
380.0
360.0
340.0
320.0
BUSINESS INVESTMENT
55.0
45.0
NONFARM RESIDENTIAL CONSTRUCTION
26.0
22.0
18.0
INVENTORY INVESTMENT
+10.0
0
-10.0
NET FOREIGN INVESTMENT
6.0
0
ACTUAL
PREDICTED
2 3 4 1 2 3 4 1 2 3 4 1 2
1960
1961
1962
1963

FIGURE 3

TABLE 5.—*Growth in gross national product*

[Billions of current dollars; seasonally adjusted at annual rates]

| Item | Actual | Experiment | | | | | |
|---|---|---|---|---|---|---|---|
| | | I. Pseudo-realistic | II. Tax reduction | III. Inventory fluctuation reduction | IV. Orders fluctuation reduction | V. Inventory and orders fluctuation reduction | VI. Altered Government expenditures pattern |
| Simulation period, 1953, 4th quarter, to 1961, 3d quarter: | | | | | | | |
| 1953, 3d quarter | 367.1 | 367.1 | 367.1 | 367.1 | 367.1 | 367.1 | 367.1 |
| 1961, 3d quarter | 525.8 | 528.9 | 542.5 | 529.1 | 529.2 | 529.3 | 545.7 |
| Increase | 158.7 | 161.8 | 175.4 | 162.0 | 162.1 | 162.2 | 178.6 |
| Simulation period, 1957, 4th quarter, to 1961, 3d quarter: | | | | | | | |
| 1957, 3d quarter | 448.3 | 448.3 | 448.3 | 448.3 | 448.3 | 448.3 | 448.3 |
| 1961, 3d quarter | 525.8 | 528.9 | 538.9 | 529.4 | 529.9 | 529.9 | 533.1 |
| Increase | 77.5 | 80.6 | 90.6 | 81.1 | 81.6 | 81.6 | 84.8 |
| Simulation period, 1960, 3d quarter, to 1961, 3d quarter: | | | | | | | |
| 1960, 2d quarter | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 | 506.4 | ---------- |
| 1961, 3d quarter | 525.8 | 527.2 | 529.5 | 525.9 | 527.1 | 526.1 | ---------- |
| Increase | 19.4 | 20.8 | 23.1 | 19.5 | 20.7 | 19.7 | ---------- |

The system devised for this study may fulfill both conditions adequately. Due to the nature of the estimated investment function, business investment is somewhat overstated after 1957, but this is not felt to be serious, since it appears that the residual (actual minus predicted) will turn positive in 1962 and, moreover, the bias is not extremely large.[30] As to prediction beyond the model construction period, regardless of the initial starting quarter, the pseudo-realistic GNP forecasts for 1961, third quarter (the last date for which actual numbers and exogenous inputs were available), all lie within 0.3 percent of each other and 0.6 percent, at a maximum, from the actual value.[31] Therefore, the model should be able to serve as a test of the long-run effect of the different stabilization policies.

As one might surmise, the inventory and orders fluctuation reduction policies have no serious impact on economic growth and the total product generated over the course of complete cycles. These stabilization measures limit the amplitude and pattern of variation of GNP in such a manner that the rate of growth is not retarded and total product is maintained.[32] This is shown by the almost exact corre-

[30] An equation without this characteristic is obviously preferred. The aberration arises from an interaction of a lagged investment term and a GNP capacity utilization variable. The physical capital stock utilization rate is a better measure of the pressure for investment in plant and equipment. Since the data here are both unavailable and unreliable (the Commerce manufacturing capital stock and McGraw-Hill capacity utilization series each suffer from major deficiencies), the initial attempt at a satisfactory explanation of business investment was made in terms of the GNP concept. Aggregation of all types of business investment and the lack of inclusion of an interest rate term may also be sources of difficulty.

Griliches has aptly made the point that autocorrelated residuals in equations of the type employed most likely represent missing variables (Zvi Griliches "A Note on Serial Correlation Bias in Estimates of Distributed Lags," Econometrica, January 1961). Given all these considerations, further attempts at investment function estimation are certainly justified.

[31] The accuracy of the forecast numbers beyond this point partially depends on the correctness of the values assumed for the exogenous variables. The latter should be modified, as required, if future predictive checks are made. Furthermore, even if the future exogenous values are correctly specified, this model, like most others, tends to remain within the range of variation of the actual economy, and, thus, the forecast for 1963, second quarter, may be slightly low.

[32] For example, in a theoretical sense, this might be accomplished by substituting a rectangular wave pattern, of identical frequency but smaller amplitude, for a triangular (sawtooth).

spondence of GNP values to each other for experiments I, III, IV, and V in quarters which can be considered cyclical midpoints, and the near identity for the total product produced under these policy alternatives and in the pseudo-realistic situation (see Table 6) for the 1953–60 and 1957–60 simulation periods.[33] Assuming that the utilization of these policy measures involves no direct costs, there also appears to be no great increase in the Government deficit. It is possible to construct theoretical economic systems which do not have this empirical characteristic of neutrality toward the rate of growth, total product, and deficit cost. Who is to say, however, that the numerical results presented are inferior to the required behavioral assumptions of such models? Only an actual test will verify the alternative conclusions.

The tax reduction and expenditure policies, as previously indicated, are directionally asymmetric. The magnitude of their effects depends on the number of quarters they have been permitted to operate. Both generate higher levels and rates of growth of GNP at a cost of increased Government deficits, as shown in Table 6. In the 1953, 4th quarter, to 1960, 4th quarter, period, the simulated tax reduction policy produced an accumulated debt of $24 billion and a $54.5 billion rise in GNP. On the other hand, the expenditure policy resulted in a slightly lower deficit, $22.2 billion, greater output production, $66.7 billion in GNP, and also provided $82.5 billion of additional Government expenditures. Clearly, if a choice were to be made solely on the basis of these figures, the expenditure policy measure would be preferred. The results of the 1957, 4th quarter, to 1960, 4th quarter, simulations do not contradict this conclusion.

Although the tax reduction policy also possesses the advantage of raising GNP, it is questionable whether (even considering the absence of any possible misallocation effects or deficiencies in direct consumer benefits), with the level and rate of increase of Government demands fixed at the pre-tax-cut point, one could justify the resulting deficits in the Federal budget. A built-in cyclically variable tax reduction policy would be preferred.[34]

In the following section, the equations of the model will be treated in limited detail. The conclusions of this study will then be presented in the final section.

[33] The accuracy of prediction of GNP is excellent, with only a 1 percent difference, after 7 years, between these values in the actual and pseudo-realistic experiment figures.

[34] For an example of such a policy, see: James S. Duesenberry, Otto Eckstein and Gary Fromm, "Stability and Instability in the American Economy," paper presented at the Social Science Research Council Conference on Economic Instability, Ann Arbor, 1959, pp. 39–43.

TABLE 6.—*Government receipts and expenditures, national income and product account basis* [1]

Billions of current dollars; seasonally adjusted]

| Item | Experiment | | | | | | |
|---|---|---|---|---|---|---|---|
| | Actual | I. Pseudo-realistic | II. Tax reduction | III. Inventory fluctuation reduction | IV. Orders fluctuation reduction | V. Inventory and orders fluctuation reduction | VI. Altered Government expenditures pattern |
| Simulation period, 1953, 4th quarter, to 1960, 4th quarter: | | | | | | | |
| Absolute values: | | | | | | | |
| GNP | 3,144.2 | 3,142.7 | 3,197.2 | 3,138.6 | 3,143.3 | 3,138.9 | 3,209.4 |
| Receipts | 625.9 | 627.3 | 603.3 | 624.7 | 627.2 | 624.6 | 687.6 |
| Expenditures | 627.8 | 627.8 | 627.8 | 627.8 | 627.8 | 627.8 | 710.3 |
| Deficit | −1.9 | −.5 | −24.5 | −3.1 | −.6 | −3.2 | −22.7 |
| Differences: [2] | | | | | | | |
| GNP | | | 54.5 | −4.1 | .6 | −3.8 | 66.7 |
| Receipts | | | −24.0 | −2.6 | −.1 | −2.7 | 60.3 |
| Expenditures | | | .0 | .0 | .0 | .0 | 82.5 |
| Deficit | | | 24.0 | 2.6 | .1 | 2.7 | 22.2 |
| Simulation period, 1957, 4th quarter, to 1960, 4th quarter: | | | | | | | |
| Absolute values: | | | | | | | |
| GNP | 1,542.2 | 1,556.3 | 1,571.6 | 1,551.9 | 1,555.8 | 1,551.7 | 1,564.5 |
| Receipts | 304.8 | 308.8 | 292.5 | 306.4 | 308.5 | 306.2 | 312.1 |
| Expenditures | 312.5 | 312.5 | 312.5 | 312.5 | 312.5 | 312.5 | 317.5 |
| Deficit | −7.7 | −3.7 | −20.0 | −6.1 | −4.0 | −6.3 | −5.4 |
| Differences: [2] | | | | | | | |
| GNP | | | 15.3 | −4.4 | −.5 | −4.6 | 8.2 |
| Receipts | | | −16.3 | −2.4 | −.3 | −2.6 | 3.3 |
| Expenditures | | | .0 | .0 | .0 | .0 | 5.0 |
| Deficit | | | 16.3 | 2.4 | .3 | 2.6 | 1.7 |

[1] The concept employed here differs slightly from that used by the Office of Business Economics. In this paper, as in the OBE income and product accounts (gross national product, table 1, and relation of GNP, national income and personal income, table 3, Survey of Current Business, July 1961, p. 6), foreign net transfers of government are excluded from Government expenditures in the income and product accounts. OBE, however, includes this figure in the computation of expenditures and the deficit in the Government receipts and expenditures account, and reports the deficit as one on national income and product account. In the table above, expenditures are Government outlays for goods and services while receipts are the sum of Federal, State and local personal tax and nontax receipts, corporate profit taxes, indirect business taxes, and contributions for social insurance, less transfer payments to persons, net interest payments, and subsidies (less current surplus of Government enterprises).

[2] Differences are absolute values for any experiment less those for experiment I, thus representing the gain or loss resulting from the implementation of the policy measures under study.

## IV. THE MODEL IN DETAIL

The simulation system employed in this study is composed of two major components. Gross national product is first built up from its demand constituents and then broken down into its tax, transfer, and income components to the point where disposable personal income has been derived. The GNP demand variables and the relation between GNP and disposable income will be treated in turn below. A list of symbols appearing in the various equations may be found in Table 7. Unless otherwise specified, the relations were fitted by least squares for the period 1953–60, with all terms in current dollars, seasonally adjusted at annual rates.

### A. GROSS NATIONAL PRODUCT DEMANDS

By definition, GNP equals the sum of personal consumption expenditures, farm and nonfarm inventory investment, business investment, nonfarm residential construction, exports minus imports, and Government expenditures for goods and services. This breakdown is, of course, arbitrary, and any other decomposition would be equally

valid. The one given, however, serves the purposes of simplifying problems of data acquisition (especially on a quarterly basis) and yielding a level of aggregation which contains the major decision elements in unique blocks, thereby reducing the number of relations which must be estimated and furthering the goal of making the system as wholly self-contained as possible.

Three of the demand variables listed are taken as exogenous—farm inventory investment, exports, and Government expenditures.[35] The first and last of these depend almost entirely on the caprice of Government and other stochastic factors (although some portion of them might be determined by structural equations); and the second, exports, is a function of foreign economic activity and could only be estimated endogenously if one had a world economic system. Discussion of the remaining demand variables follows.

TABLE 7.—*List of symbols*

All variables are seasonally adjusted. Dollar magnitudes are in current dollars, at annual rates, unless otherwise indicated.]

| | |
|---|---|
| $c$ | Per capita personal consumption expenditure |
| $y$ | Per capita personal disposable income |
| $y_8$ | 8-period moving average of $y$ |
| $R^2$ | Explained variance of the equation |
| $SE$ | Standard error of estimate |
| $D\text{-}W$ | Durbin Watson coefficient |
| $s$ | Per capita services consumption |
| $\Delta I$ | Nonfarm inventory investment, 1954 dollars |
| $F$ | Inventory discrepancy reaction coefficient |
| $S^G$ | Final sales of goods, 1954 dollars |
| $\Delta O$ | Change in unfilled orders, 1954 dollars |
| $O_{t-1}$ | Stock of unfilled orders outstanding at end of period $t$–1, 1954 dollars |
| $\Delta S^G$ | Change in final sales of goods, 1954 dollars |
| $N$ | New orders, 1954 dollars |
| $I^T$ | Business investment in construction and equipment |
| $RE$ | Corporate retained earnings |
| $Depn$ | Corporate depreciation allowances |
| $\overset{4}{\Sigma}$ | 4-period moving average |
| $GNP$ | Gross national product |
| o | Previous peak value |
| $I^{PDE}$ | Producers' durable equipment expenditures |
| $H$ | Nonfarm residential housing stock, 1947–49 dollars |
| $I^H$ | Nonfarm residential construction |
| $t_H$ | Time trend for housing stock equation, 1953, 4th quarter=0 |
| $Pop$ | Population residing in the States of the United States, millions |
| $GNP^{54}$ | Gross national product, 1954 dollars |
| $GNP_k{}^{54}$ | Potential gross national product, 3½ percent annual rate of increase at 1955 level, 1954 dollars |
| $P_{GNP}$ | Implicit price deflator for GNP, 1954=100 |
| $M$ | Imports of goods and services |
| $\Delta I^{Tot}$ | Total inventory investment |
| $S^T$ | Total final sales of goods and services |
| $C_A$ | Capital consumption allowances |
| $I^{T+H}$ | Business investment in construction and equipment plus nonfarm residential construction |
| $I_8{}^{T+H}$ | 8-period moving average of $I^{T+H}$ |
| $T_{BUS}$ | Indirect business taxes |
| $C_{TRIB}$ | Personal contributions for social insurance |
| $D_1{}^{57-58}$ | Rate and coverage dummy in $C_{TRIB}$ equation, equals unity in 1957 and 1958, zero in all other quarters |
| $D_2{}^{59}$ | Similar to $D_1{}^{57-58}$ |
| $D_3{}^{60}$ | Similar to $D_1{}^{57-58}$ |
| $U$ | Unemployed workers, millions |
| $U_B$ | Unemployment benefits |

[35] The goods components of exports and Government expenditures are also estimated exogenously.

TABLE 7.—*List of symbols*—Continued

| | |
|---|---|
| $A$ | Old age and survivors' insurance benefits plus veterans' benefits |
| $R$ | Relief payments plus other miscellaneous transfers |
| $i$ | Government interest payments |
| $\pi_{BT}$ | Profits before tax adjusted for $IVA$, corporate sector |
| $IVA$ | Inventory valuation adjustment |
| $\pi_{TAX}$ | Corporate profits tax liability |
| $\pi_{BTU}$ | Corporate profits before tax, unadjusted for $IVA$ |
| $t_{53}$ | Time trend, 1953, 1st quarter=1 |
| $Div$ | Corporate dividend payments |
| $\pi_{AT}$ | Profits after tax |
| $T_{PF}$ | Personal Federal tax and nontax liability |
| $Y_P$ | Personal income |
| $T_{PS}$ | Personal State and local tax and nontax liability |

*1. Consumption*

On the basis of previous work, the general form of the consumption function had already been narrowed to a spectrum of relations which are of the ratio type and display ratchet or moving average characteristics on income and consumption.[36] As was shown in the paper cited, the ratchet effect and the permanent income hypothesis, as approximated by a Koyck-type distributed lag, are interchangeable. Other variables, such as debt, assets, and marriage rates, were not found to enter the aggregate consumption equation significantly, although they do have an effect on some of the durable goods components.

After some reflection and an initial attempt to reproduce the fits for the earlier ratchet functions, it was decided to modify the permanent income moving average hypothesis to account for income fluctuations about the moving average and the impact of the rate of change of income. Each is felt to be independently significant, although in concept they are similar.

There was some uncertainty as to the time span over which the income moving average should be taken. Four and eight quarters were arbitrarily chosen as alternatives. The expectation (subsequently fulfilled) was, however, that the parameter estimates should be generally insensitive to the period chosen. A ratio form was employed to minimize collinearity and spurious trend effects. The equations were fitted on both a current and constant dollar basis. The rationale of consumer behavior would normally dictate the formulation of a per capita relation in real terms. Nevertheless, from the viewpoint of minimizing exogenous inputs or estimating equations in the model, a current dollar function was preferred. When it was found that the differences in the two types of function were not statistically significant, the current dollar version was chosen for inclusion in the simulation system.

[36] "A Simulation of the U.S. Economy in Recession," op. cit., pp. 800-807.

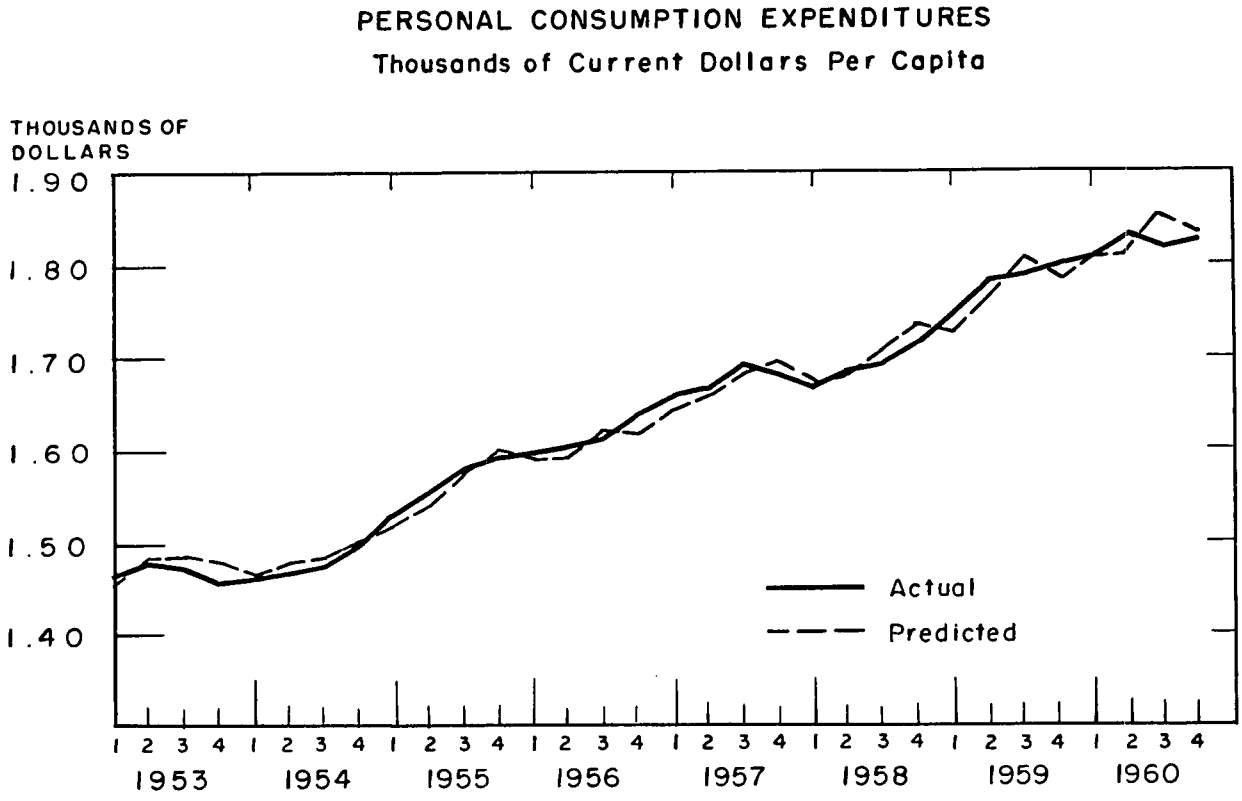
PERSONAL CONSUMPTION EXPENDITURES
Thousands of Current Dollars Per Capita
THOUSANDS OF DOLLARS
1.90
1.80
1.70
1.60
1.50
1.40
Actual
Predicted
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
1953
1954
1955
1956
1957
1958
1959
1960

FIGURE 4

The functions were first fitted in ratio form to perform a check on their validity. Subsequently, after a choice of the appropriate equation, income in the previous quarter was cross-multiplied.[37] The final version selected (predicted and actual values are plotted in Figure 4) was

$$c_t = \underset{(.1235)}{.0095} + \underset{(.1086)}{.1870} y_{t-1} - .3697 (y - y_8)_{t-1} \cdot \frac{y_{t-1}}{y_{t-2}} + \underset{(.1322)}{.8041} c_{t-1} \cdot \frac{y_{t-1}}{y_{t-2}}.$$

$$R^2 = .9903 \qquad SE = .0123 \qquad D\text{-}W = 2.2793$$

In other words, current dollar per capita consumption in period $t$ is related to last period's consumer disposable income, the difference of income from an eight-period moving average of income multiplied by the rate of change of income—all in the last period, and last period's consumption multiplied by the rate of change of income in that period. The interpretation to be placed on this function is that consumption plans are formulated on the basis of last period's consumption (a habituation effect) and the moving average of income (the permanent income hypothesis). These must, however, be adjusted for the rapidity of increase of last period's income, i.e., the observed behavior conforms to a static growth situation adjusted for dynamic factors.

The consumption of services, over the postwar era, is largely one of a trend phenomenon, evidencing little cyclical variability. A consumption function similar to that presented above explains services consumption about as well as any other relation. (All have degrees of explained variance of approximately 0.99.) There appears to be no real reason to prefer one over the other, so the following has been chosen for purposes of symmetry.

$$\frac{s_t}{y_{t-1}} = \underset{(.0340)}{.0130} - .0927 \frac{(y - y_8)_{t-1}}{y_{t-2}} + \underset{(.0290)}{.9748} \frac{s_{t-1}}{y_{t-2}}.$$

$$R^2 = .9754 \qquad SE = .0025 \qquad D\text{-}W = 2.2795$$

it shows the expected low income elasticity and the strong trend.

*2. Nonfarm inventory investment*

The basic motivation underlying investment in inventories was explored in section II above. It was concluded that inventory accumulation, with the cost factors given, is a function of sales expectations, the initial inventory position, and unfilled orders. Emphasis was also placed on the fact that inventory investment tends to be passive when the inventory-sales ratio lies in a certain range and sales are increasing at some normal rate. When the gap between the actual and equilibrium stock becomes too great, or sales expectations are markedly revised, a rapid adjustment is made to return the inventory level to the desired equilibrium range. This adjustment,

[37] This should and does have practically no effect on the equation parameters or the estimation residuals. It merely enables ready computation of the explained variance of $c_t$. The ratio function results are

$$\frac{c_t}{y_{t-1}} = \underset{(.0951)}{.1582} - .3754 \frac{(y - y_8)_{t-1}}{y_{t-2}} + \underset{(.1192)}{.8418} \frac{c_{t-1}}{y_{t-2}}.$$

$$R^2 = .6452 \qquad SE = .0066 \qquad D\text{-}W = 2.2948$$

however, tends to be unstable, both in exact timing and magnitude, thus limiting the chances for a highly successful statistical explanation of inventory behavior.

Data problems also beset the econometrician in this area. Inventory fluctuations cannot be explained in current dollar terms, but must be analyzed in constant dollars. The Department of Commerce publishes deflated sales data but, unfortunately, does not provide unfilled orders on the same basis.

In addition, there is some question as to how the matter of recontract in the durable goods area has been handled. Current period durable sales are not necessarily made at prices prevailing in the current quarter. Many durable goods must be ordered far in advance. Some contracts for future delivery call for renegotiation of the price to be paid at the time of delivery; others, for a price fixed at the time of placing the order. Deflation of current period durable sales by quoted prices (as represented by the wholesale price index) in that quarter results in an understatement of real demand when prices are rising, and an overstatement when they are falling. Any cyclical variability in prices then plays havoc with the estimation of real durables sales. Unfilled orders deflation, of course, faces the same difficulty as that of sales deflation. In this study, due to a lack of more precise information, the level of unfilled orders has been deflated by the Commerce sales deflator.

In light of the theoretical discussion presented and the previous work cited, it was decided to fit a stock adjustment equation, in constant dollars, of the type

$$\Delta I_t = F(\alpha S_t^G - I_{t-1}) + \beta \Delta S_t^G + \gamma \Delta O_{t-1} + \delta O_{t-1} + \epsilon.$$

$\Delta I_t$ is total nonfarm inventory investment; $F$ is the fraction of any discrepancy between desired and actual inventories to be removed in a quarter; $\alpha$, the desired inventory-sales ratio; $S^G$, the final sales of goods; $I_{t-1}$, the beginning-of-period inventory stock; and $O_{t-1}$, the beginning-of-period level of manufacturers' unfilled orders. It would have been desirable to obtain an orders variable on a final product basis. Unfortunately, no such data exist, and, therefore, it was necessary to utilize the Commerce series which merely aggregates orders at all levels.

Several variations of this function, a ratio formulation, sales ratchets, rates of change, etc., were also subjected to statistical testing. Generally, the explained variance was not high (as was expected) and several variables were collinear. The final version chosen for use in the model was

$$\Delta I_t = -29.4345 + .4601 S_t^G - .7314 I_{t-1} + .1658 \Delta O_{t-1}.$$
$$\qquad\qquad\quad (.1368) \qquad (.2235) \qquad (.0511)$$

$$R^2 = .7809 \qquad SE = 1.9124 \qquad D\text{-}W = 1.4761$$

Inclusion of several other terms ($O_{t-1}$, $\Delta S_t^G$, and $\Delta I_{t-1}$) was precluded either by collinearity or by lack of significant coefficients. Their contribution to explained variance and impact on the pattern of residuals was negligible. (Residuals for this function are shown in figure 5. The large errors in 1959 and 1960, first quarter, should be attributed to the anticipation and adjustment for the steel strike which occurred in 1959, third and fourth quarters.)

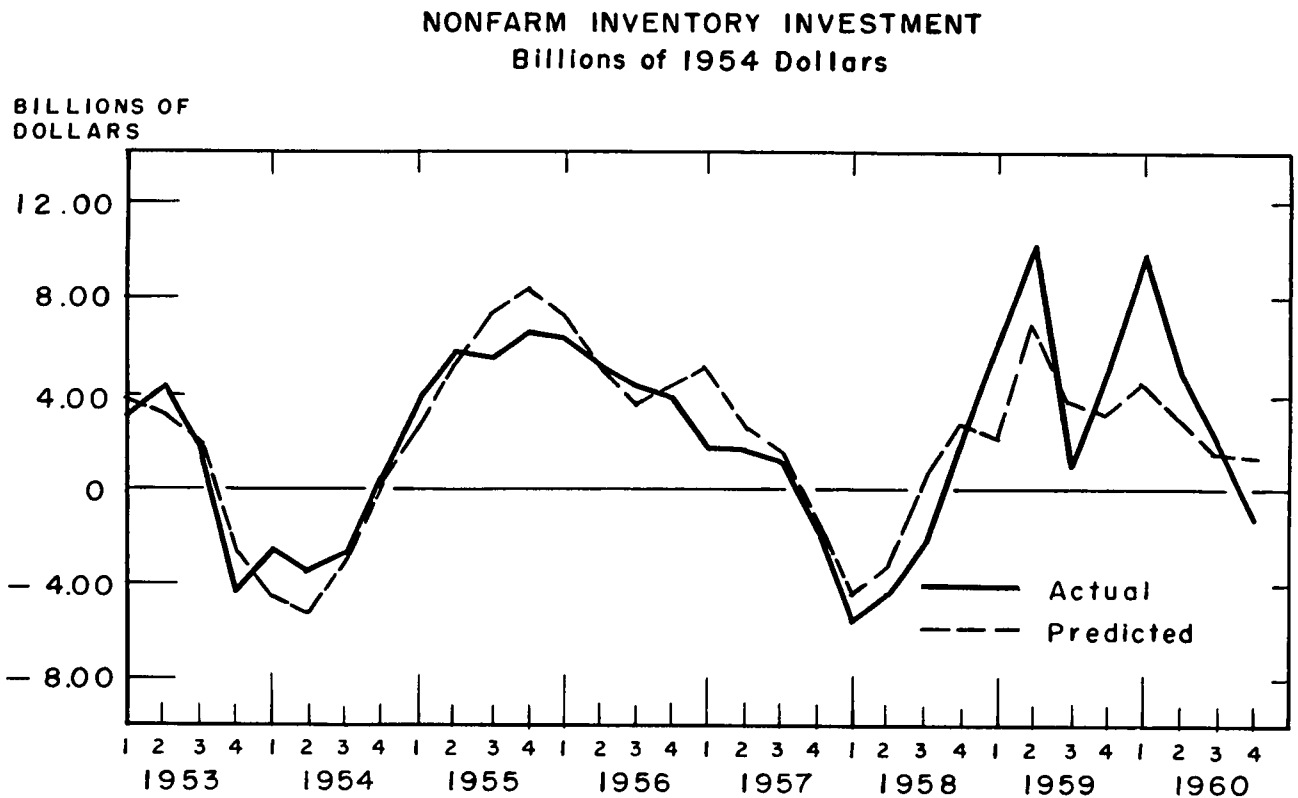
NONFARM INVENTORY INVESTMENT
Billions of 1954 Dollars
BILLIONS OF DOLLARS
12.00
8.00
4.00
0
— 4.00
— 8.00
Actual
Predicted
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
1953 1954 1955 1956 1957 1958 1959 1960

FIGURE 5

The large negative constant term can probably be explained by a combination of two factors—noncomparability due to double counting in the orders variable and aggregation problems of lumping together durable and nondurable inventory investment (the inventory-sales ratios in the two sectors differ). Any nonlinearity of the sales-inventory relation would most likely be evidenced by a positive constant term, since a less-than-proportionate increase in inventories is needed as sales increase.

The rationale in estimating the change in unfilled orders was as follows. The change in unfilled orders is identically equal to new orders (net of cancellations) minus sales. Sales in the current period are predetermined by structural elements of previous quarters (cf. the consumption function, etc.). Therefore, one desires to explain new orders.

Firms place new orders on much the same basis as they accumulate inventory, that is, to enable them to satisfy future demands. Current sales and changes in sales are taken as indicators of future sales levels. Orders already outstanding, however, will satisfy some of those needs and thus have a repressive effect on new orders. Nevertheless, even given a large orders backlog, there is a certain amount of human inertia and ordering patterns tend to persist. (This is verified by the cycles in the average lead time of purchasing agents' orders.)

All these factors, including the general tendency of production plans to change gradually, are reflected in the estimated unfilled orders function.

$$\Delta O_t = \underset{}{111.3995} - \underset{(.1092)}{.3878 S_t^a} + \underset{(.3325)}{.5229 \Delta S_{t-1}^a} - \underset{(.1039)}{.5545 O_{t-1}} + \underset{(.1007)}{.8099 \Delta O_{t-1}}.$$

$$R^2 = .8334 \qquad SE = 4.6067 \qquad D\text{-}W = 2.5420$$

The remarks, made above, about the constant term of the inventory equation are also applicable here. The coefficient of the sales term, as expected, is negative.[38] On the whole, the equation has coefficients which make sense in terms of sign and orders of magnitude, although some of the parameters might be somewhat lower. The theory outlined seems plausible, but is only an initial attempt. Obviously, a great deal of work remains to be done before a satisfactory explanation of orders behavior can be achieved.

*3. Business investment*

Most investigators of business investment behavior have stressed three key variables as explanatory factors for cyclical fluctuations in addition to the capital stock.[39] These are the state of demand, the rate of capacity utilization, and the availability of internally generated investment funds.

[38] Let $N_t$ = new orders, and $N_t = \alpha + \beta S_t^a$, with $\beta < 1$. Since $\Delta O_t \equiv N_t - S_t^a$, $\Delta O_t = \alpha + (\beta - 1) S_t^a$.

[39] See, for example, John R. Meyer and Edwin Kuh, The Investment Decision: An Empirical Study, Cambridge, Harvard University Press, 1957.

This does not mean that other considerations do not play a major role in the investment decision. Management prestige, community relations, solidifying market share, etc., all influence the level of investment. In terms of cyclical response, however, their impact is slight and is reflected only in a passive response to the major determinants cited. In other words, the secondary factors raise the average level of investment but respond, cyclically, in conformity to the more primary forces.

In order to simplify the overall model, all business investment, with the exception of inventories, was lumped together in one aggregate.[40] Thus, the investment variable includes such diverse components as manufacturing investment in plant and equipment, public utility investment, commercial construction, oil and gas well drilling, etc. To differing degrees, all obey the same constraints, but their cyclical timing and responsiveness cannot be presumed to be identical. Nevertheless, it was hoped that an investment function based on the major considerations mentioned above would yield a reasonable approximation of aggregate business investment behavior.

The variable employed to represent the growth of demand and the level of capacity utilization was a moving average of the ratio of GNP to its previous peak, lagged one quarter. The previous peak value of GNP, of course, does not strictly represent the actual capacity limitation of the private economy. First of all, Government value added is included; secondly, capacity increases even when output has fallen below the levels attained in an earlier quarter due to technological progress and cost reduction investment. It would have been preferable to utilize a capital stock or a direct capacity utilization measure. Unfortunately, these series are not available.[41] Therefore (and since estimation of private GNP would have been an onerous task), previous peak GNP was retained as the capacity measure.

The other major factor, the availability of internally generated investment funds, is, of course, equal to the sum of retained earnings and depreciation. A lagged investment term has also been included in the investment equation. The nature of business investment is one which necessarily requires outlays spread over several periods. Plants are not built or equipped in a single quarter. Thus, a moving average process is indicated.

[40] A component, producers' durable equipment expenditures, was estimated separately, however, in order to furnish an endogenously generated segment of final sales of goods demand.

[41] Neither the Commerce, nor McGraw-Hill data, the only two series published, are sufficiently accurate to fulfill this requirement. The alternative of employing the Federal Reserve Board index of industrial production is also unacceptable since it has been found that its movements are not consistent with the national income accounts and it does not provide a measure of the production of services which also require investment.

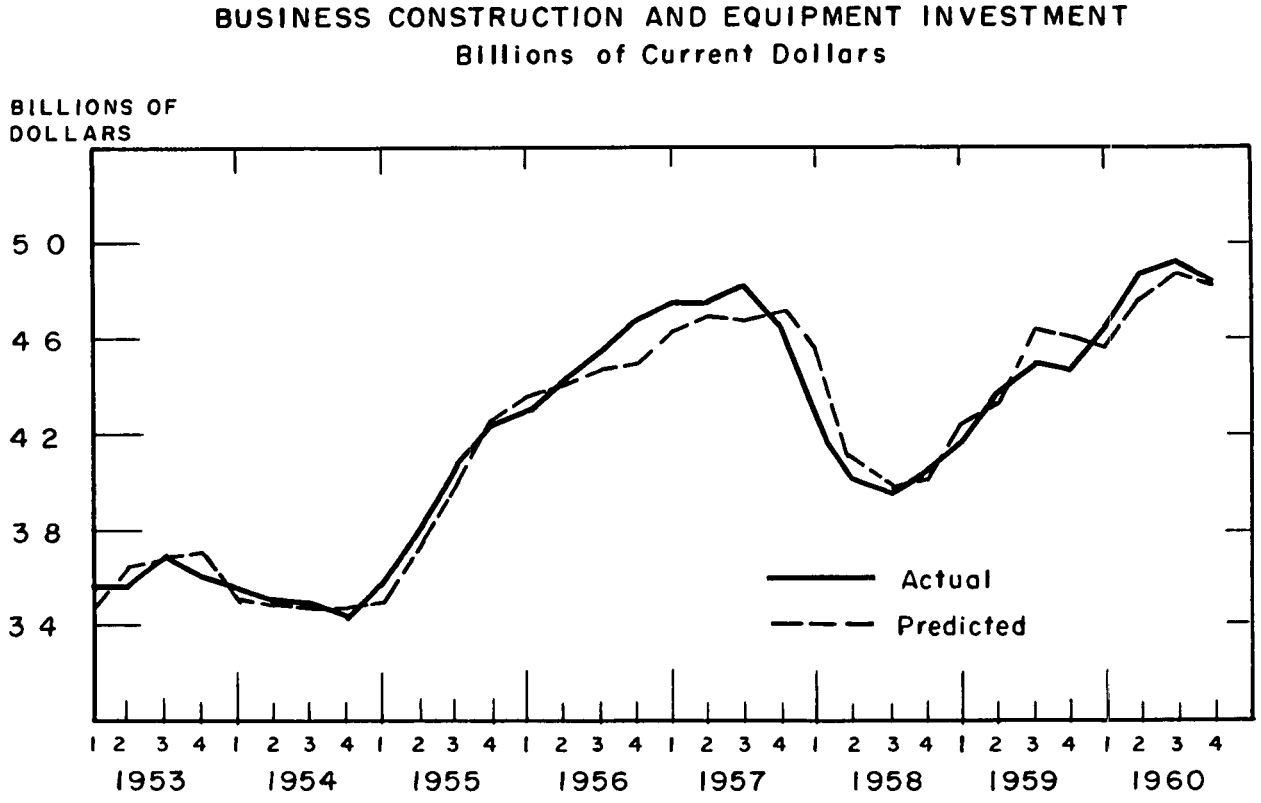
BUSINESS CONSTRUCTION AND EQUIPMENT INVESTMENT
Billions of Current Dollars
BILLIONS OF DOLLARS
5 0
4 6
4 2
3 8
3 4
Actual
Predicted
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
1953 1954 1955 1956 1957 1958 1959 1960

FIGURE 6

The function derived (residuals are depicted in Figure 6) is

$$I_t^T = \underset{(.0716)}{-15.9083+.3582(RE+Depn)_{t-1}} + \underset{(14.2179)}{20.8567}\left[\sum^{4}\frac{GNP_t}{GNP_{t_0}}\right]_{t-1} + \underset{(.0679)}{.6596 I_{t-1}^T}.$$

$$R^2=.9558 \qquad SE=1.0356 \qquad D\text{-}W=1.3443$$

This equation should not be thought of as a basic structural relation, but as a means of approximating the movement of aggregate business investment. It suffers from the deficiencies already mentioned, and has a tendency to propagate simulation system errors. For example, overstatement of $GNP_{t-1}$ would result in a negative residual (actual minus predicted) for $I_t^T$ which would then contribute to an error in $GNP_t$. In the second round, both $I_{t-1}^T$ and $GNP_{t-1}$ are overstated and the investment estimation residual becomes even greater, etc. Whether this occurs depends on the directional concordance of errors in prediction of the other equations in the model and the relative magnitude of the capacity utilization and lagged investment term coefficients. Both conditions contribute to the failure of this function to decline to the depths of actual business investment expenditures. Nevertheless, in terms of the cyclical pattern of its response, it is reasonably accurate.[42]

*4. Nonfarm residential construction*

The analysis of nonfarm residential construction may follow two approaches. The first of these is to estimate the number of dwelling units started in every quarter and the price to be paid for these units. Price and quantity can then be cross-multiplied and distributed over the quarters necessary to complete a house. This is essentially the approach taken by the Department of Commerce in constructing the national income series for nonfarm residential construction. An addition must also be made for the value of repairs and modernization of existing houses. The other method of attack, one which is pursued here, is to estimate the value of construction directly by means of its relation to a set of independent variables.

[42] Further efforts to improve estimation in this area are certainly desirable. Disaggregation, inclusion of an interest rate variable, a direct capacity measure, a funds availability variable which includes the noncorporate sector (the model only generates corporate income and not that of individual proprietors; in the equation above, the cyclical pattern of the latter is assumed to parallel the former), and other considerations, all should be taken into account. A similar equation was employed to estimate producers' durable equipment expenditures. Its interpretation is identical to that presented above. The equation reads:

$$I^{PDE}= \underset{(.0542)}{-20.7506+.2360\,(RE+Depn)_{t-1}} + \underset{(13.0098)}{24.1986}\left[\sum^{4}\frac{GNP_t}{GNP_{t_0}}\right]_{t-1} + \underset{(.0885)}{.6141}\ I_{t-1}^{PDE}.$$

$$R^2=.9154 \qquad SE=.8904 \qquad D\text{-}W=1.5925$$

The housing market is partially one of direct demand and supply satisfaction (individuals demand houses and have them built to their specifications) and partially one of builder speculation (most nonfarm residential construction activity takes place on this second-named basis). In the latter case the builder (or promoter) surveys potential demand and then, if it seems that a profitable future sale can be made, he invests in an inventory of houses. His ability to do this, however, is constrained by the availability and cost of funds (most builders borrow the required capital). The evaluation of potential demand is carried out by reviewing several factors—the available housing stock (quantity and quality), growth in population, and consumer income and willingness to purchase at the time the house is put on the market.

The variables that have been employed to represent these effects are the real value of the housing stock [43] at the time the builder begins to implement his decision, population, and the gap, valued in current dollars, between actual and potential GNP. A trend term has also been included in order to reflect the steady increase in the value added per housing start in the postwar period.

The equation derived is as follows:

$$I_t^H = \underset{}{91.9168} - \underset{(\ .1893)}{1.4308 H_{t-3}} + \underset{(\ .7824)}{1.2004 Pop} + \underset{(.0147)}{.0773}\left(GNP_{t-1}^{54} - GNP_{k\ t-1}^{54}\right) \cdot P_{GNP_{t-1}} + \underset{(\ .6199)}{2.3889 t_H}.$$

$$R^2 = .9212 \qquad SE = .7073 \qquad D\text{-}W = 1.4624$$

It suffers from the failure to include terms for the cost and availability of funds, both on the builder and consumer sides. Several additional functions incorporating variables to account for these effects were fitted. On the cost side, a whole spectrum of interest rate variables. generally, were not statistically significant, nor did they add much to explained variance. A FNMA mortgage commitment and a banking system excess reserve variable did improve the explained variance of the functions markedly. However, since the desire was to keep the simulation system as completely endogenous as possible, and the inclusion of these monetary factors would have necessitated a major effort in model revision, they were omitted. The residuals (pictured in Figure 7) suffer accordingly.

[43] Housing stock data were provided by Alfred Conrad, who generated the series by applying demolition and depreciation factors to an initial stock value (taken from Grebler and Maisel) and additions to the stock. The following regression was employed to serve as a proxy for estimating a price deflator for additions to the stock and the depreciation and demolition rates.

$$H_t = \underset{}{58.7988} + \underset{(.0945)}{.6850 H_{t-1}} + \underset{(.0486)}{.2230 I_t^H} + \underset{(.1978)}{.6200 t_H}.$$

$$R^2 = .9996 \qquad SE = .3639 \qquad D\text{-}W = 1.9216$$

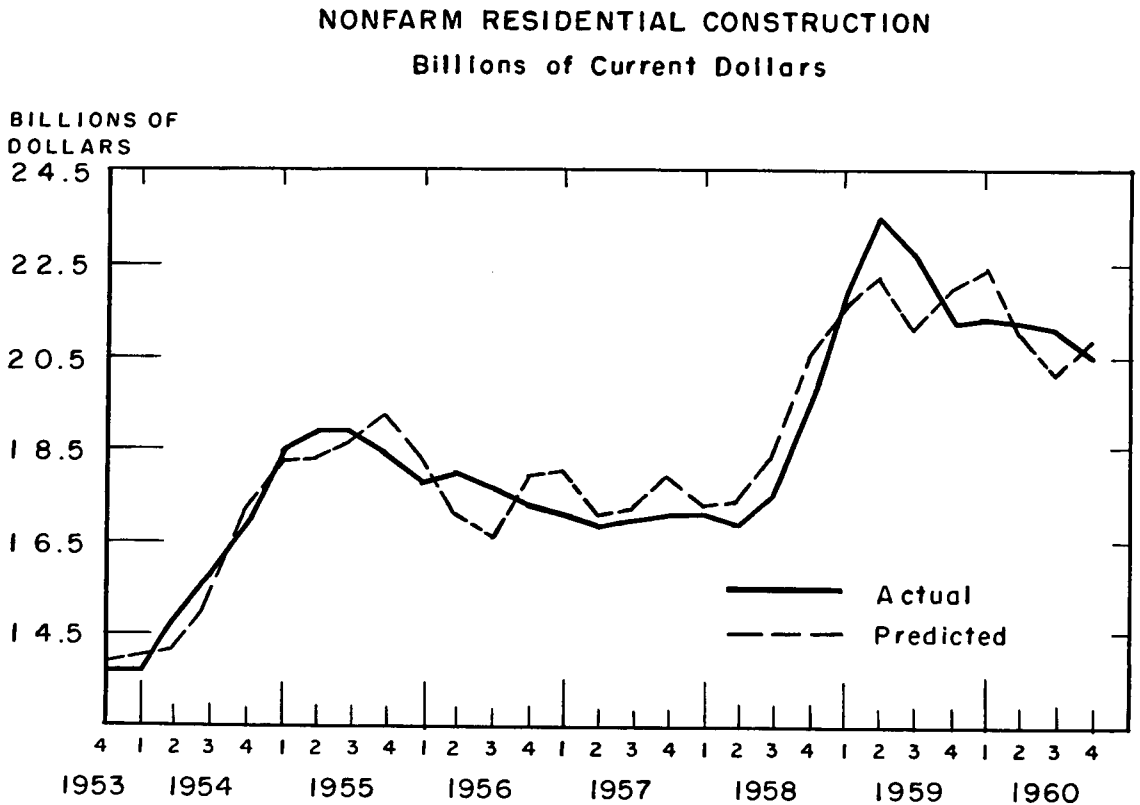
NONFARM RESIDENTIAL CONSTRUCTION
Billions of Current Dollars
BILLIONS OF DOLLARS
24.5
22.5
20.5
18.5
16.5
14.5
Actual
Predicted
4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
1953 1954 1955 1956 1957 1958 1959 1960

FIGURE 7

*5. Imports*

The theory of import demands employed here may be summarized simply as being one of buyer habituation and stock accumulation for future production and sales. The estimated equation is

$$M_t = \underset{}{-.1594} + \underset{(.0315)}{.0563}\,\Delta I^{To\prime}_{t-1} + \underset{(.0135)}{.0206} S^{T}_{t-1} + \underset{(.2392)}{.5775} M_{t-1}.$$

$$R^2 = .9490 \qquad SE = .6114 \qquad D\text{-}W = 1.4100$$

where $M$ and $S^T$ are imports and final sales of goods and services, respectively, and $\Delta I^{To\prime}$ is farm and nonfarm inventory investment.

Since 1953, the goods component of imports has been approximately constant at around 62 percent of total imports. Because the variance was less than 0.3 percent, the mean, or 62.61 percent, was employed to estimate the amount to be subtracted from total final sales of goods to derive domestic goods sales.

*6. Price deflators*

Three price deflators are utilized in the simulation model. Of these, two, the inventory and sale of goods deflators, are taken as exogenous. The GNP price deflator is estimated by

$$P_{GNP} = \underset{(.0001)}{-.0381} + \underset{}{.0002} \left[ \sum^{2} (GNP_t^{54} - GNP_{k_t}^{54}) \cdot P_{GNP_t} \right]_{t-1} + \underset{(.0159)}{1.0431} P_{GNP_{t-1}}.$$

$$R^2 = .9970 \qquad SE = .0032 \qquad D\text{-}W = 1.4982$$

This says, in essence, that prices tend to trend upward at the rate of 2 percent per year when the economy is operating at its full employment potential, and at successively lower rates as the gap between actual and potential GNP (evaluated at current prices) widens. The use of the gap concept at this point serves as a proxy for a more elaborate cyclical demand and wage pressure indicator. The trend is an approximation for the net effect of the long-run increases in wages, productivity, and profit margins. Although this function is somewhat oversimplified, it works extremely well, as may be seen in Figure 8.

### B. RELATION OF GROSS NATIONAL PRODUCT AND DISPOSABLE INCOME

The equations above enable the computation of GNP. The next step is to derive the response of personal disposable income to changes in GNP. With the determination of disposable income, one can then proceed to the following quarter's iteration.

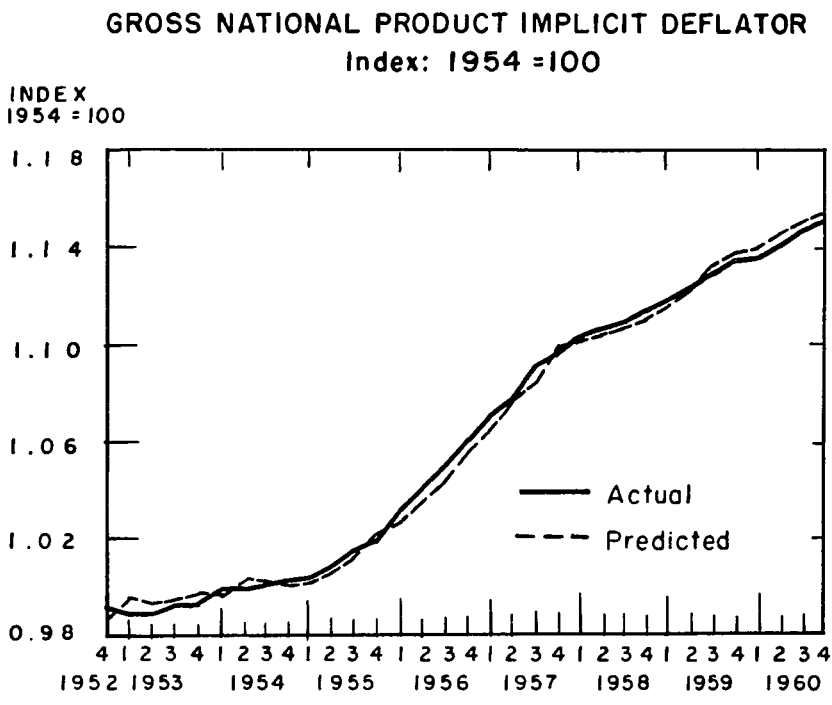


FIGURE 8

By definition,

Personal disposable income = Gross national product
- Capital consumption allowances
- Indirect business tax and nontax liability
- Statistical discrepancy
+ Subsidies minus current surplus of Government enterprises
- Corporate profits and inventory valuation adjustment
- Contributions for social insurance
- Excess of wage accruals over disbursements
+ Government transfer payments to persons
+ Net interest paid by Government
+ Dividends
- Personal Federal tax and nontax payments
- Personal State and local tax and nontax payments.

Each of these, with the exception of the exogenous components, will be discussed briefly below.[44] Statistical discrepancy, Government subsidies, and wage accruals are estimated exogenously.

[44] A thorough review can be found in "Stability and Instability in the American Economy," op. cit. The statistical discrepancy item is reviewed in Peter E. deJanosi, "The Statistical Discrepancy in the National Income Accounts Revisited," Econometrica, July 1961.

*1. Capital consumption allowances*

Capital consumption allowances over the past decade have increased at almost an exact linear trend rate, with only extremely minor fluctuations occurring cyclically. The reasons for this are the long-period moving average of capital stock depreciation (thus, current investment has little impact) and the steady rise in the price of investment goods. Fitting the moving average, and including a term for any cyclical responsiveness of the allowances, one obtains

$$C_{A_t}=.4823+\underset{(.0039)}{1.0000}C_{A_{t-1}}+\underset{(.0108)}{.0443}(I_t^{T+H}-I_{8_t}^{T+H}).$$

$$R^2=.9993 \qquad SE=.2186 \qquad D\text{-}W=1.3546$$

Corporate depreciation (for which annual data only are available), was fitted, using a similar function, on a yearly basis and then interpolated (by employing the function) to derive a series for use in the investment equation. Since no corporate investment data are available, a GNP potential gap was employed as a dummy to approximate the almost negligible cyclical effects. The function derived was

$$Depn_t=1.7991+\underset{(.0404)}{1.0055}Depn_{t-1}+\underset{(.0135)}{.0203}(GNP_t^{54}-GNP_{k_t}^{54}).$$

$$R^2=.9965 \qquad SE=.2381 \qquad D\text{-}W=3.1955$$

*2. Indirect business tax and nontax liability*

Indirect business taxes (which are mainly State and Federal excises and local property taxes) have remained an almost constant fraction of GNP for the last 15 years. The decrease in some Federal excise tax rates in 1954 and the erosion of excises by inflation have been offset by increases in State and local tax rates. Excises, of course, are regressive in nature and, thus, indirect business taxes exhibit perverse cyclical variability. As income falls, a greater fraction of consumption is spent on items which bear such levies (gasoline, liquor, and tobacco). The regressivity effects can readily be seen in the estimated function

$$T_{BUS}=-10.0006+\underset{(.0069)}{.1097}GNP_t-\underset{(.0012)}{.0605}(GNP_t-GNP_{t_0}).$$

$$R^2=.9969 \qquad SE=.2972 \qquad D\text{-}W=1.2876$$

*3. Contributions for social insurance*

Contributions for social insurance by employers, employees, and self-employed individuals move almost proportionately to wages and salaries. This is not surprising, since the largest share of these is collected on the basis of a percentage of such income. Wages and salaries as percentages of GNP show no cyclical pattern and have not exhibited more than a slight trend. In the estimated relation, therefore, GNP can readily be employed to represent wages and salaries. Increases in the extent of Federal OASI coverage and the level of

contribution rates, in 1957, 1959, and 1960, are approximated by three dummy variables.[45] The equation found is

$$C_{TRIB} = -11.1396 + .0560 GNP_t + .9763 D_1^{57-58} + 1.3785 D_2^{59} + 3.0207 D_3^{60}.$$
$$\qquad\qquad (.0038) \qquad (.2730) \qquad (.4235) \qquad (.4958)$$

$$R^2 = .9908 \qquad SE = .3568 \qquad D\text{-}W = 1.0107$$

*4. Government transfer payments to persons*

The several components of Government transfer payments have been combined into categories for which quarterly series of data are available.

(*a*) *Unemployment benefits.*—The relation of unemployment insurance benefit payments to declines in GNP is a function of several factors—the amount of unemployment, the fraction of workers who are insured, the level of benefits, and the percentage of covered workers who have exhausted their benefits. Other factors which influence benefit collections are the mandatory waiting period and the ineligibility of people who leave employment voluntarily.

Total unemployment can be quite adequately explained by an equation which makes use of a GNP potential gap and a persistence variable. The gap represents the failure of the economy to attain achievable levels of output and utilize the available labor force; the persistence variable, the difficulty of workers in finding jobs once they have been displaced. The function fitted,

$$U = 2.4274 + .0404 GNP_{k_t}^{54} - .0433 GNP_t^{54} + .4658 U_{t-1},$$
$$\qquad\qquad (.0038) \qquad (.0042) \qquad (.0598)$$

$$R^2 = .9615 \qquad SE = .1699 \qquad D\text{-}W = 1.2195$$

also allowed for an additional independent effect (beyond the gap) of the current level of output, but this was found to be small.

The equation for estimating unemployment benefits is as follows:

$$U_{B_t} = -.7734 + .7719 U_t + .0222 (GNP_{k_t}^{54} - GNP_t^{54}) \cdot P_{GNP_t}.$$
$$\qquad\qquad (.1947) \quad (.0115)$$

$$R^2 = .8986 \qquad SE = .3280 \qquad D\text{-}W = .9688$$

It subsumes the effect of the insured worker percentage, the benefit level, and the exhaustion rate in the interaction of the unemployment and current dollar GNP potential gap terms. The explanation probably lies in a nonuniformity of layoffs between insured and uninsured, and ineligible and eligible, workers. When employment conditions worsen, many persons in the pool of workers are on the verge of benefit exhaustion. These individuals fail to find jobs and, thus, exhaustions rise rapidly, tending to decrease aggregate unemployment benefits. Secondly, the workers who initially become unemployed (or fail to find employment) are those who are either not insured or ineligible to receive benefits. As the recession is prolonged, however, greater numbers of insured and eligible workers

[45] Multiplicative dummies are preferred as adjustment factors in this case, but it was decided that the benefits of employing them might not justify the effort necessary to determine the percentage of total wages and salaries earned by the newly covered groups.

lose their jobs and receive benefits. Since the big spurt in exhaustions has already occurred, there is no great diminution in total benefits for some time. As to the trend in benefit levels, both variables in the equation have trends in the same direction and thereby reflect the gradual increase in the weekly benefit check.

(*b*) *OASI and veterans' benefits.*—Old age and survivors' insurance benefits and veterans' benefits have been rising steadily in the last decade. The number of older people has been growing, the lengthening history of the OASI system and the broadening of its coverage has increased the number of people eligible to receive benefits, and the benefit maximums and minimums have been raised. There appears to be practically no cyclical variability to the sum of these benefits and they are readily explained by a simple exponential function.

$$A_t = \underset{(\ .0201)}{.1942 + 1.0090 A_{t-1}}.$$

$$R^2 = .9882 \qquad SE = .3383 \qquad D\text{-}W = 2.4067$$

(*c*) *Relief payments and other transfers.*—Relief payments, together with other miscellaneous transfers, such as Government life insurance, railroad retirement and civil service pensions, etc., exhibit a strong upward trend but also show a marked cyclical response. The latter is due to the fact that as the economic situation worsens, families on partial relief are unable to find employment and must receive greater benefits; the former, to trends in the benefits of the miscellaneous items, to the persistence of payments, and to increases in the numbers of those receiving relief. Transfers in this category were estimated by the relation

$$R_t = \underset{(.0297)}{.2240} + \underset{(.0025)}{.9714 R_{t-1}} + .0052 (GNP^{54}_{k_t} - GNP^{54}_{t}) \cdot P_{GNP_t}.$$

$$R^2 = .9904 \qquad SE = .1248 \qquad D\text{-}W = 2.1163$$

*5. Net interest paid by Government*

Net interest paid by Government depends chiefly on two factors: the amount of debt outstanding and the average interest rate on the debt. Both the amount of debt and Government interest rates have been trending upward. Interest rates, however, do exhibit cyclical variability depending on refinancing requirements, the state of the economy, and monetary and debt management policy. Therefore, Government interest payments either fall or slow their rate of increase in a recession, and rise rapidly in a boom. The equation employed to mirror these effects is

$$i_t = \underset{(.0224)}{-.2360} + \underset{(.0025)}{1.0536 i_{t-1}} + .0056 (GNP_t - GNP_{t_0}).$$

$$R^2 = .9871 \qquad SE = .1085 \qquad D\text{-}W = 1.2193$$

The difference between current period GNP and its previous peak serves as a proxy for the net effect of all the divergent pressures on Government interest over the business cycle. When the model is modified to include a monetary sector, the dummy will be replaced by an actual interest rate term.

*6. Corporate profits and inventory valuation adjustment*

In a previous paper, the fall in corporate profits (before taxes, adjusted for inventory valuation adjustment) plus depreciation from its previous peak was explained by the decline (previous peak to current quarter) in sales and inventory investment over the same interval.[46] The reason for inclusion of the sales term is obvious. The inventory variable was said to represent: (1) the tone of the markets in the economy (the degree of utilization of the capital stock, sales expectations, and price reduction pressures); and (2) the fact that corporate profits are concentrated in capital intensive industries which are relatively far back in the productive process and which, therefore, are particularly adversely affected when sales are out of finished goods inventories rather than out of early-stage production. It was subsequently discovered that the inventory term had no real significance of its own, other than to serve as a means of introducing a cyclical industrial composition adjustment into the equation.[47] Inventories primarily represented the greater cyclical volatility of manufacturing sector profits, which appear to vary in conformity with inventory investment. The manufacturing profits, however, were found to be determined by a combination of a full cost price markup phenomenon and cyclical swings in both production and nonproduction worker productivity. Some modification of the profits function was therefore indicated.

Schultze has suggested that the share of corporate profits in corporate product is a function of the deviations of corporate product from normal capacity and that the share of corporate product in total GNP is related to a similar capacity concept for that variable.[48] His conclusions are that the share of corporate product and profits falls as the gap widens.

A similar concept has been employed for the formulation of the profits relation derived in this study. Corporate profits are said to be a function of sales, inventory change, and the gap between actual and potential (or normal) output evaluated in current prices.

$$\pi_{BT_t} = \underset{}{8.9205} + \underset{(.0088)}{.0768} S_t^T + \underset{(.0793)}{.5787} \Delta I_t^{Tot} + \underset{(.0297)}{.1371} (GNP_t^{54} - GNP_{k_t}^{54}) \cdot P_{GNP_t}.$$

$$R^2 = .9509 \qquad SE = 1.0755 \qquad D\text{-}W = 1.4423$$

Profits ($\pi_t$) are defined as before tax and adjusted for *IVA*. The sales term represents the normal share of profits in GNP; the inventory term, the tendency for the commodity output share to vary inversely with cyclical swings in output; and the GNP gap, the cyclical variation in the corporate share of total national product. Residuals for this function are depicted in Figure 9. This equation might also be given a microeconomic interpretation—the coefficient of the sales term is the normal profit margin, the inventory term is an adjustment for the differential effect of selling goods out of stock, and the gap term is an indicator of the pressure on unit costs and prices as capacity utilization declines. The macro- and microeconomic meanings do not conflict and are relatively consistent with each other.

[46] "A Simulation of the U.S. Economy in Recession," op. cit., pp. 784–786.

[47] G. Fromm, "A Dynamic Empirical Model of the U.S. Economy," paper presented at the meetings of the Econometric Society, St. Louis, December 1960. Abstract in Econometrica, July 1961.

[48] Charles L. Schultze, "Short Run Movements of Income Shares," paper presented at the National Bureau of Economic Research Conference on Research in Income and Wealth, New York, Apr. 28–29, 1961

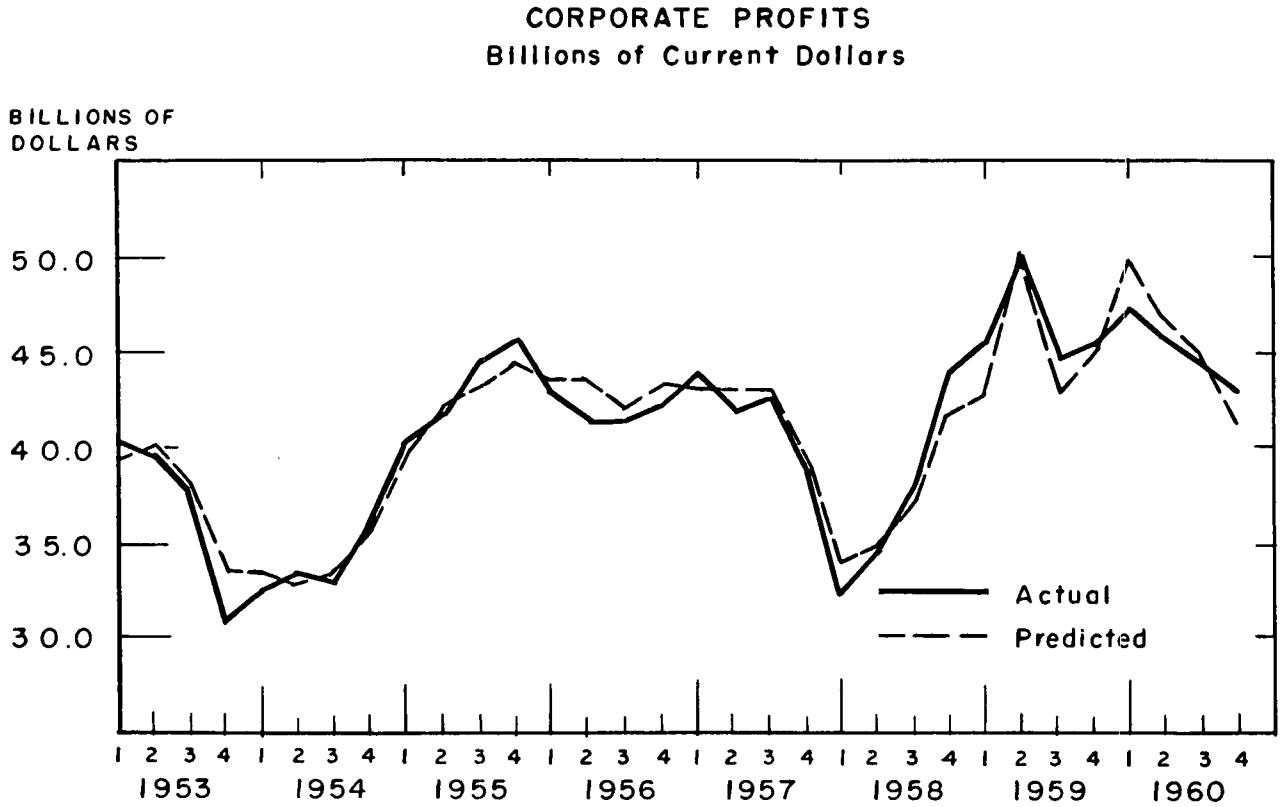
CORPORATE PROFITS
Billions of Current Dollars
BILLIONS OF DOLLARS
50.0
45.0
40.0
35.0
30.0
Actual
Predicted
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
1953
1954
1955
1956
1957
1958
1959
1960

FIGURE 9

*7. Dividends*

Dividends can only be determined after subtracting the corporate tax liability from corporate profits. Taxes are incurred on profits before *IVA*, which must, therefore, be deducted from the corporate profits variable previously determined. (*IVA* is an exogenous input to the system.)

Corporate income taxes were found to obey the following relation for the period 1954–60 (the tax code was revised in 1954).

$$\pi_{TAX} = \underset{}{2.9019} + \underset{(.0237)}{.4101}\pi_{BTU_t} + \underset{(.0135)}{.0206}(GNP_t - GNP_{t_0}) + \underset{(.0091)}{.0252}t.$$

$$R^2 = .9846 \qquad SE = .2988 \qquad D\text{-}W = .6627$$

Taxes are not merely a simple percentage of profits before tax for several reasons. First, the corporate Federal income tax has a step function at the $25,000 income level, at which point tax rates rise from 30 percent to 52 percent. There can thus be some cyclical variability in tax rates as firms cross the surtax barrier. The GNP term compensates for this effect. Second, with a fixed income step and surtax structure, inflation will gradually drive even extremely small corporations into the higher bracket. This occurrence, as represented by the trend variable, is partially offset by the fragmentation of some firms into many small corporate units. Third, income averaging provisions of the tax code (carryback and carryforward) result in a lower average tax rate on current profits than would be expected from merely applying the statutory rate—for example, some firms earn current profits and pay no taxes due to the fact that they incurred losses in the 3 prior tax years.

Given after-tax profits, one can then estimate corporate dividends. Lintner's function has almost universally been adopted for this purpose. It is based on the theory that the firm has a target dividend-payout ratio which it approaches by closing any gap between desired and actual dividends by a constant percentage of the discrepancy. The function, fitted to data for 1953–60, reads

$$Div_t = \underset{}{.0293} + \underset{(.0262)}{.0534}\pi_{AT_t} + \underset{(.0471)}{.9152}Div_{t-1}.$$

$$R^2 = .9540 \qquad SE = .3560 \qquad D\text{-}W = 2.8659$$

Retained earnings are then equal to after-tax profits less dividends.

*8. Personal Federal tax and nontax payments*

There have been several studies of the cyclical properties of the Federal income tax. Most of these have based their analysis, correctly, on a determination of the tax base, i.e., taxable income as a percentage of adjusted gross or personal income. The next steps, normally, are application of an average effective tax rate modified by its current income elasticity to taxable income, and then substitution, by means of the previously derived relationship, of personal income for taxable income to yield an equation for Federal income taxes in terms of personal income. This procedure has a limitation, however: due to the 3-year lag in the issuance of Internal Revenue Service reports on taxable income, one must guess the current effective tax rate. There is the additional problem that the quarterly Commerce data aggregate Federal taxes and nontaxes.

For these reasons it was decided to fit a Federal tax and nontax equation directly. Various theories were tried, the final function chosen being

$$T_{PF}=91.5328+.1473Y_P+1.2845\times10^{-4}Y_P^2-.7171Pop.$$
$$\qquad\qquad\quad (.0531)\qquad (.3300\times10^{-4})\qquad (.1767)$$

$$R^2=.9874 \qquad SE=.5114 \qquad D\text{-}W=1.7575$$

This corresponds, at mean values for the 1954–60 period, to a marginal tax rate on personal income of 21 percent, or an elasticity of 2.

*9. Personal State and local tax and nontax payments*

Personal State and local taxes and nontaxes reveal little cyclical variability and a strong trend over the years 1953 through 1960. The function used for their estimation is

$$T_{PS}=1.3815+.0063Y_P+.0892t.$$
$$\qquad\qquad\quad (.0021)\qquad (.0091)$$

$$R^2=.9996 \qquad SE=.0639 \qquad D\text{-}W=1.9688$$

## V. Conclusions

The conclusions of this study of inventory fluctuations and cyclical instability can be briefly summarized.

1. The last decade has witnessed three recessions, each of which appears to have been caused, to some significant extent, either by an initial shock in Government expenditures, by a sudden decline in fixed investment, or by both. Of the two factors, instability in Government demands appears to bear the greater burden of responsibility.

2. Subsequent to such a shock, an inventory reaction sets in, engendering a rapid fall in national income. Some analysts have placed the blame for these 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. If so, any stabilization efforts might best be directed at removing the primary sources of instability. This does not mean, however, that endogenous 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.

3. Nevertheless, 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. Firms do not, however, adjust their stock levels continuously to a desired norm—due partially to the costs of control and partially to human inertia.

4. When marked 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.*

5. In the realm of influencing the structural coefficients in the inventory accumulation function, long-run improvements in methods and costs of inventory control will bring about a continued decline in inventory-sales ratios and a heightened sensitivity to changes in sales expectations.

6. Since Government probably can do little to influence the cyclical costs of maintaining inventories (tax credit schemes might prove expensive in terms of direct expense and potential misallocations of resources), *the primary hope for inventory investment stabilization most likely lies in altering the timing and magnitude of Government demand.* Countercyclical orders and expenditures will have the desired effect, but any errors in stability management will also be magnified and would cause undesirable effects.

7. In order to measure the impact of alternative patterns of inventory fluctuation, a dynamic, empirical, quarterly model of the U.S. economy was constructed. The simulation system yielded a reasonably accurate portrayal of cyclical behavior of the economy from 1953 onwards, and an excellent prediction of GNP in 1961, 3d quarter.

8. A test of six stabilization policies was undertaken and revealed that a 17.5 percent reduction in personal Federal income taxes resulted

in a decline in the fall of GNP, peak to trough, by 49 percent in the 1953–54 recession, and by 126 percent in the 1957–58 recession; a 50 percent reduction in the amplitude of fluctuations of nonfarm inventory investment stabilized income by approximately 30 percent; a 20 percent reduction in unfilled orders fluctuation resulted in an increase in stability of 13 percent; and a combination of the inventory and orders policies offset the GNP declines by about 38 percent. A revised Government expenditures policy, permitting outlays to rise on a long-term linear basis from previous peak levels, resulted in a 75 percent offset to the 1953–54 recession. In terms of the cost to accomplish these ends, a $1 decline in taxes produces a $0.72 increase in GNP; a reduction in inventory disinvestment by $1, a $1.03 increase in GNP; and an increase in expenditures of $1, a $1.11 increase in GNP.

9. A simulation determination as to whether any of the inventory policies had an adverse effect on economic growth demonstrated that such was not the case. It further revealed that from 1953 to 1960 it would have been possible to increase Government expenditures by $82.5 billion and GNP by $66.7 billion with a rise of only $22.2 billion in the national debt.

10. Further research on the relative importance of various endogenous factors and both exogenous and endogenous shocks is extremely desirable. Although inventory fluctuations may not be the primary cause of cyclical instability, stabilization efforts to limit inventory reversals and losses of output should be considered an objective of Government.

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# APPENDIX

APPENDIX TABLE I–A.—*Gross national product demands, actual values: 1953, 1st quarter, to 1961, 4th quarter*

[Billions of current dollars, seasonally adjusted at annual rates]

| Year | 1953 | | | | 1954 | | | | 1955 | | | | 1956 | | | | 1957 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quarter | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Gross national product | 364.5 | 368.8 | 367.1 | 361.0 | 360.0 | 358.9 | 362.0 | 370.8 | 384.3 | 393.0 | 403.4 | 408.9 | 410.6 | 415.0 | 421.0 | 430.0 | 438.5 | 442.1 | 448.3 | 442.3 |
| Personal consumption expenditure | 230.9 | 233.3 | 234.1 | 232.3 | 233.7 | 236.5 | 238.7 | 243.2 | 249.4 | 254.3 | 260.9 | 263.3 | 265.6 | 268.2 | 270.4 | 275.6 | 280.1 | 283.3 | 288.7 | 288.6 |
| Goods | 151.3 | 152.1 | 151.3 | 148.6 | 149.1 | 151.0 | 151.8 | 154.9 | 159.4 | 162.7 | 167.5 | 168.0 | 168.5 | 169.3 | 169.4 | 172.8 | 175.9 | 177.1 | 180.7 | 178.7 |
| Services | 79.6 | 81.2 | 82.8 | 83.7 | 84.6 | 85.5 | 86.9 | 88.3 | 90.0 | 91.6 | 93.4 | 95.3 | 97.1 | 98.9 | 101.0 | 102.8 | 104.2 | 106.2 | 108.0 | 109.9 |
| Gross private domestic investment | 52.0 | 52.9 | 51.1 | 45.2 | 46.6 | 47.2 | 48.8 | 52.3 | 58.8 | 63.1 | 65.4 | 67.6 | 67.1 | 66.9 | 67.3 | 68.1 | 67.1 | 67.3 | 67.6 | 62.4 |
| Business construction and equipment investment | 35.7 | 35.8 | 36.7 | 36.1 | 35.5 | 35.2 | 35.1 | 34.5 | 35.9 | 38.1 | 40.8 | 42.5 | 43.1 | 44.5 | 45.7 | 46.8 | 47.7 | 47.7 | 48.2 | 46.5 |
| Nonfarm residental construction | 13.7 | 14.0 | 13.8 | 13.7 | 13.7 | 14.7 | 15.8 | 17.0 | 18.5 | 18.9 | 18.9 | 18.4 | 17.8 | 18.0 | 17.6 | 17.3 | 17.1 | 16.9 | 17.0 | 17.1 |
| Inventory investment | 2.5 | 3.1 | .7 | −4.6 | −2.6 | −2.7 | −2.1 | .8 | 4.4 | 6.1 | 5.7 | 6.7 | 6.3 | 4.5 | 3.9 | 4.0 | 2.3 | 2.7 | 2.5 | −1.2 |
| Farm | −.5 | −.9 | −.8 | −.3 | .2 | .5 | .7 | .6 | .6 | .4 | .2 | .0 | −.3 | −.7 | −.5 | −.1 | .3 | .7 | .9 | 1.1 |
| Nonfarm | 3.0 | 4.0 | 1.5 | −4.3 | −2.8 | −3.2 | −2.8 | .2 | 3.8 | 5.7 | 5.5 | 6.7 | 6.6 | 5.2 | 4.4 | 4.1 | 2.0 | 2.0 | 1.5 | −2.3 |
| Net foreign investment | −.3 | −.7 | −.8 | .0 | .3 | .8 | .4 | 2.3 | 1.5 | .7 | 1.3 | .9 | 1.4 | 2.6 | 3.5 | 4.3 | 6.0 | 5.1 | 5.1 | 3.5 |
| Exports | 16.5 | 16.5 | 16.7 | 16.7 | 16.0 | 17.9 | 17.3 | 18.7 | 18.7 | 18.6 | 20. | 20.3 | 21.4 | 22.6 | 24.1 | 24.5 | 27.0 | 26.4 | 26.6 | 24.9 |
| Imports | 16.7 | 17.2 | 17.5 | 16.7 | 15.7 | 17.1 | 16.8 | 16.5 | 17.2 | 17.9 | 18.7 | 19.4 | 20.0 | 20.0 | 20.5 | 20.2 | 21.0 | 21.3 | 21.5 | 21.3 |
| Government purchases of goods and services | 81.8 | 83.3 | 82.7 | 83.5 | 79.4 | 74.4 | 74.1 | 73.0 | 74.6 | 74.9 | 75.8 | 77.1 | 76.6 | 77.3 | 79.8 | 82.0 | 85.3 | 86.4 | 86.9 | 87.7 |

| Year | 1958 | | | | 1959 | | | | 1960 | | | | 1961 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quarter | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Gross national product | 432.9 | 437.2 | 447.0 | 460.6 | 472.2 | 488.5 | 482.3 | 488.3 | 501.5 | 506.4 | 505.1 | 504.5 | 500.8 | 516.1 | 525.8 | 542.2 |
| Personal consumption expenditure | 287.4 | 290.9 | 294.5 | 299.8 | 305.8 | 313.6 | 316.5 | 320.0 | 323.8 | 329.9 | 329.7 | 332.3 | 330.7 | 336.1 | 341.0 | 348.4 |
| Goods | 176.0 | 177.4 | 179.3 | 182.7 | 186.4 | 191.7 | 192.1 | 193.0 | 195.2 | 198.7 | 196.1 | 196.9 | 193.2 | 196.2 | 198.6 | 203.6 |
| Services | 111.4 | 113.5 | 115.2 | 117.1 | 119.4 | 121.9 | 124.4 | 127.0 | 128.6 | 131.2 | 133.6 | 135.4 | 137.5 | 139.9 | 142.4 | 144.9 |
| Gross private domestic investment | 53.9 | 53.0 | 55.8 | 63.6 | 70.4 | 79.1 | 68.2 | 71.8 | 78.9 | 74.6 | 70.5 | 65.6 | 59.8 | 68.8 | 73.2 | 76.6 |
| Business construction and equipment investment | 42.3 | 39.9 | 39.4 | 40.4 | 41.4 | 44.0 | 45.0 | 44.9 | 46.4 | 48.0 | 47.1 | 47.0 | 44.6 | 45.4 | 46.6 | 48.3 |
| Nonfarm residential construction | 17.1 | 16.9 | 18.0 | 19.9 | 21.9 | 23.5 | 22.6 | 21.3 | 21.5 | 21.2 | 21.0 | 20.5 | 19.3 | 20.6 | 22.1 | 23.0 |
| Inventory investment | −5.5 | −4.0 | −1.6 | 3.3 | 7.1 | 11.7 | .7 | 5.6 | 10.9 | 5.4 | 2.4 | −1.9 | −4.0 | 2.8 | 4.5 | 5.3 |
| Farm | 1.0 | 1.0 | .9 | .7 | .2 | .1 | .0 | .1 | .1 | .3 | .4 | .3 | .3 | .4 | .4 | .2 |
| Nonfarm | −6.5 | −5.0 | −2.5 | 2.6 | 6.9 | 11.6 | .7 | 5.5 | 10.8 | 5.1 | 2.0 | −2.2 | −4.3 | 2.4 | 4.1 | 5.1 |
| Net foreign investment | 1.7 | 1.3 | 1.6 | .4 | −.6 | −1.7 | −.5 | .0 | 1.8 | 2.3 | 3.0 | 5.1 | 5.3 | 3.9 | 2.6 | 4.0 |
| Exports | 22.5 | 22.7 | 22.9 | 22.7 | 22.1 | 22.3 | 24.0 | 24.1 | 25.6 | 26.7 | 26.8 | 27.6 | 27.6 | 26.4 | 27.0 | 28.5 |
| Imports | 20.8 | 21.4 | 21.4 | 22.3 | 22.7 | 24.0 | 24.5 | 24.0 | 23.9 | 24.4 | 23.8 | 22.4 | 22.3 | 22.5 | 24.3 | 24.5 |
| Government purchases of goods and services | 89.8 | 92.0 | 95.1 | 96.7 | 96.7 | 97.5 | 98.1 | 96.5 | 96.9 | 99.6 | 101.9 | 101.6 | 105.0 | 107.3 | 109.0 | 113.2 |

Sources: 1953–55, "U.S. Income and Output"; 1956–60, Survey of Current Business, July 1961; 1961, Survey of Current Business, February 1962.

APPENDIX TABLE I–B.—*Relation of gross national product and disposable income, actual values: 1953, 1st quarter, to 1961, 4th quarter*

[Billions of current dollars, seasonally adjusted at annual rates]

| Year | 1953 | | | | 1954 | | | | 1955 | | | | 1956 | | | | 1957 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quarter | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Gross national product | 364.5 | 368.8 | 367.1 | 361.0 | 360.0 | 358.9 | 362.0 | 370.8 | 384.3 | 393.0 | 403.4 | 408.9 | 410.6 | 415.0 | 421.0 | 430.0 | 438.5 | 442.1 | 448.3 | 442.3 |
| Capital consumption allowances | 25.6 | 26.2 | 26.8 | 27.4 | 27.9 | 28.5 | 29.1 | 29.9 | 30.8 | 31.6 | 32.4 | 33.0 | 33.6 | 34.1 | 34.7 | 35.3 | 36.6 | 37.3 | 37.8 | 38.0 |
| Net national product | 338.9 | 342.6 | 340.3 | 333.6 | 332.1 | 330.4 | 332.9 | 340.9 | 353.5 | 361.4 | 371.0 | 375.9 | 377.0 | 380.9 | 386.3 | 394.7 | 401.9 | 404.8 | 410.5 | 404.3 |
| Indirect business tax and nontax liability | 29.8 | 30.1 | 30.4 | 30.4 | 30.1 | 30.2 | 29.8 | 30.5 | 31.4 | 32.8 | 33.3 | 34.0 | 34.5 | 35.3 | 35.9 | 37.1 | 37.6 | 38.2 | 38.5 | 38.4 |
| Statistical discrepancy | 1.1 | 2.0 | .8 | 1.2 | 1.0 | −.8 | .8 | 1.7 | 3.7 | −.2 | 1.2 | −.9 | −1.3 | −3.3 | −2.8 | −2.2 | −.2 | −1.1 | −.6 | −.3 |
| Subsidies minus current surplus of Government enterprises | −.4 | −.4 | −.5 | −.5 | −.4 | −.3 | −.2 | .0 | .0 | .0 | .1 | .2 | .8 | .9 | 1.0 | 1.1 | 1.2 | 1.1 | .9 | .8 |
| National income[1] | 306.3 | 308.7 | 307.2 | 300.1 | 299.3 | 299.4 | 300.9 | 307.5 | 316.9 | 327.3 | 335.0 | 341.4 | 343.2 | 348.3 | 352.6 | 359.1 | 364.0 | 367.1 | 371.6 | 365.1 |
| Corporate profits and inventory valuation adjustment | 40.5 | 39.8 | 37.5 | 31.4 | 32.5 | 33.3 | 33.0 | 36.1 | 40.3 | 41.9 | 44.4 | 45.8 | 42.7 | 41.5 | 41.5 | 42.3 | 43.5 | 42.2 | 42.5 | 38.4 |
| Contributions for social insurance | 8.8 | 8.9 | 8.7 | 8.5 | 9.6 | 9.6 | 9.7 | 9.9 | 10.6 | 10.8 | 11.2 | 11.4 | 12.1 | 12.4 | 12.8 | 13.1 | 14.4 | 14.5 | 14.7 | 14.6 |
| Excess of wage accruals over disbursements | 0 | −.1 | −.1 | −.1 | 0 | 0 | 0 | 0 | .1 | .5 | −.6 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| Government transfer payments to persons | 12.7 | 12.7 | 12.8 | 13.4 | 14.1 | 14.9 | 15.2 | 15.9 | 15.7 | 16.2 | 16.1 | 16.2 | 16.7 | 17.1 | 17.4 | 17.7 | 18.6 | 20.2 | 20.2 | 21.5 |
| Net interest paid by Government | 5.1 | 5.1 | 5.2 | 5.3 | 5.4 | 5.4 | 5.4 | 5.4 | 5.3 | 5.3 | 5.4 | 5.5 | 5.5 | 5.7 | 5.8 | 5.9 | 6.1 | 6.2 | 6.3 | 6.3 |
| Dividends | 9.3 | 9.4 | 9.4 | 9.4 | 9.4 | 9.5 | 9.7 | 10.1 | 10.2 | 10.5 | 10.9 | 12.2 | 11.7 | 12.0 | 12.3 | 12.0 | 12.7 | 12.8 | 12.9 | 12.3 |
| Personal income[1] | 285.4 | 288.7 | 289.8 | 289.7 | 287.4 | 287.6 | 289.7 | 294.2 | 298.5 | 307.5 | 313.8 | 319.7 | 323.8 | 330.9 | 335.4 | 341.1 | 345.1 | 351.4 | 355.6 | 354.1 |
| Personal Federal tax and nontax payments | 32.1 | 32.5 | 32.5 | 32.3 | 29.1 | 29.0 | 29.1 | 29.4 | 30.6 | 31.3 | 31.9 | 32.3 | 34.5 | 35.1 | 35.3 | 35.8 | 37.0 | 37.4 | 37.6 | 37.4 |
| Personal State and local tax and nontax payments | 3.3 | 3.4 | 3.5 | 3.5 | 3.7 | 3.8 | 3.8 | 3.9 | 4.1 | 4.2 | 4.3 | 4.3 | 4.7 | 4.8 | 4.9 | 5.0 | 5.1 | 5.2 | 5.4 | 5.4 |
| Personal disposable income | 250.0 | 252.8 | 253.8 | 253.8 | 254.6 | 254.8 | 256.8 | 260.9 | 263.8 | 272.0 | 277.7 | 283.0 | 284.6 | 291.1 | 295.2 | 300.3 | 303.0 | 308.8 | 312.7 | 311.2 |

| Year | 1958 | | | | 1959 | | | | 1960 | | | | 1961 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quarter | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Gross national product | 432.9 | 437.2 | 447.0 | 460.6 | 472.2 | 488.5 | 482.3 | 488.3 | 501.5 | 506.4 | 505.1 | 504.5 | 500.8 | 516.1 | 525.8 | 542.2 |
| Capital consumption allowances | 38.2 | 38.3 | 38.8 | 39.2 | 39.8 | 40.6 | 41.1 | 41.8 | 42.5 | 43.0 | 43.2 | 43.7 | 44.2 | 45.0 | 45.5 | 46.1 |
| Net national product | 394.7 | 398.9 | 408.2 | 421.4 | 432.4 | 447.9 | 441.2 | 446.5 | 459.0 | 463.4 | 461.9 | 460.8 | 456.6 | 471.1 | 480.3 | 496.1 |
| Indirect business tax and nontax liability | 38.4 | 39.0 | 39.4 | 40.4 | 41.5 | 42.1 | 43.1 | 43.9 | 45.3 | 45.9 | 45.5 | 45.9 | 45.7 | 46.4 | 47.5 | 48.9 |
| Statistical discrepancy | −1.9 | −1.0 | −1.9 | −1.4 | −.9 | −.9 | −2.8 | −1.8 | −1.1 | −2.9 | −4.0 | −2.9 | −2.6 | −1.7 | −1.8 | n.a. |
| Subsidies minus current surplus of Government enterprises | 1.0 | 1.2 | 1.2 | 1.2 | .7 | .5 | .3 | .3 | .5 | .6 | .5 | .5 | .5 | 1.4 | 1.8 | 1.9 |
| National income[1] | 357.4 | 360.2 | 370.1 | 381.7 | 390.7 | 405.2 | 399.4 | 402.8 | 413.5 | 419.2 | 419.0 | 416.5 | 412.2 | 426.0 | 434.3 | n.a. |
| Corporate profits and inventory valuation adjustment | 32.5 | 34.4 | 37.9 | 43.8 | 45.3 | 50.2 | 44.4 | 45.5 | 47.4 | 45.9 | 44.1 | 42.9 | 40.0 | 45.5 | 47.0 | n.a. |
| Contributions for social insurance | 14.6 | 14.6 | 15.0 | 15.2 | 17.1 | 17.6 | 17.7 | 17.8 | 20.4 | 20.7 | 21.1 | 20.8 | 21.2 | 21.7 | 22.0 | 22.6 |
| Excess of wage accruals over disbursements | .6 | .6 | −1.3 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| Government transfer payments to persons | 22.8 | 24.9 | 25.5 | 25.2 | 24.9 | 25.1 | 25.2 | 26.3 | 26.3 | 26.8 | 27.5 | 28.8 | 30.1 | 31.0 | 31.6 | 31.4 |
| Net interest paid by Government | 6.1 | 6.1 | 6.1 | 6.4 | 6.6 | 6.9 | 7.2 | 7.5 | 7.7 | 7.8 | 7.8 | 7.7 | 7.5 | 7.3 | 7.2 | 7.2 |
| Dividends | 12.6 | 12.6 | 12.6 | 12.0 | 13.0 | 13.3 | 13.7 | 13.8 | 14.0 | 14.0 | 14.1 | 14.3 | 14.2 | 14.2 | 14.3 | 15.0 |
| Personal income[1] | 353.1 | 356.0 | 364.5 | 368.2 | 374.7 | 384.6 | 385.1 | 388.9 | 395.5 | 403 1 | 405.1 | 405.4 | 404.7 | 413.2 | 420.3 | 428.6 |
| Personal Federal tax and nontax payments | 36.1 | 36.2 | 37.0 | 37.3 | 38.7 | 39.8 | 39.9 | 40.0 | 42.7 | 43.3 | 43.5 | 43.1 | 42.6 | 43.6 | 44.5 | 44.8 |
| Personal State and local tax and nontax payments | 5.6 | 5.7 | 5.7 | 5.8 | 6.2 | 6.3 | 6.5 | 6.6 | 7.1 | 7.2 | 7.3 | 7.4 | 7.7 | 7.8 | 8.0 | 8.3 |
| Personal disposable income | 311.4 | 314.2 | 321.8 | 325.0 | 329.8 | 338.4 | 338.7 | 342.3 | 345.7 | 352.7 | 354.4 | 354.9 | 354.3 | 361.8 | 367.8 | 375.6 |

[1] Includes adjustment for business transfer payments, not shown separately.

Source: See Appendix Table I-A.

APPENDIX TABLE II–A–1.—*U.S. economy simulations—Pseudo-realistic situation: Gross national product demands*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | | | | |
| | | Total | Goods | Services | | | | Total | Farm | Nonfarm | Total | Exports | Imports | |
| 1953—3d quarter [1] | 367.1 | 234.1 | 151.3 | 82.8 | 51.2 | 36.7 | 13.8 | 0.7 | −0.8 | 1.5 | −0.8 | 16.7 | 17.5 | 82.7 |
| 4th quarter | 364.2 | 232.2 | 148.5 | 83.7 | 49.3 | 37.2 | 14.6 | −2.5 | −.3 | −2.2 | −.8 | 16.7 | 17.5 | 83.5 |
| 1954—1st quarter | 358.6 | 234.0 | 149.6 | 84.4 | 46.6 | 36.6 | 14.7 | −4.8 | .2 | −5.0 | −1.4 | 16.0 | 17.4 | 79.4 |
| 2d quarter | 359.4 | 237.5 | 151.7 | 85.7 | 46.7 | 35.9 | 14.3 | −3.5 | .5 | −4.0 | .8 | 17.9 | 17.1 | 74.4 |
| 3d quarter | 365.6 | 242.0 | 154.4 | 87.6 | 49.2 | 35.4 | 15.1 | −1.2 | .7 | −1.9 | .3 | 17.3 | 17.0 | 74.1 |
| 4th quarter | 373.4 | 245.8 | 156.5 | 89.3 | 53.0 | 35.6 | 15.9 | 1.6 | .6 | 1.0 | 1.6 | 18.7 | 17.1 | 73.0 |
| 1955—1st quarter | 382.0 | 249.9 | 158.6 | 91.3 | 56.3 | 36.3 | 16.7 | 3.2 | .6 | 2.6 | 1.2 | 18.7 | 17.5 | 74.6 |
| 2d quarter | 388.7 | 253.1 | 160.0 | 93.1 | 60.1 | 37.7 | 17.7 | 4.7 | .4 | 4.3 | .7 | 18.6 | 17.9 | 74.9 |
| 3d quarter | 398.8 | 257.9 | 162.3 | 95.6 | 63.4 | 39.2 | 18.2 | 6.0 | .2 | 5.8 | 1.6 | 20.0 | 18.4 | 75.8 |
| 4th quarter | 406.3 | 261.1 | 163.5 | 97.6 | 66.6 | 41.0 | 18.7 | 6.9 | .0 | 6.9 | 1.4 | 20.3 | 18.9 | 77.1 |
| 1956—1st quarter | 409.7 | 264.1 | 164.6 | 99.6 | 66.9 | 42.8 | 18.8 | 5.3 | −.3 | 5.6 | 2.0 | 21.4 | 19.4 | 76.6 |
| 2d quarter | 412.1 | 266.3 | 165.2 | 101.1 | 65.5 | 43.7 | 18.5 | 3.4 | −.7 | 4.1 | 3.0 | 22.6 | 19.6 | 77.3 |
| 3d quarter | 417.4 | 269.3 | 166.5 | 102.8 | 64.0 | 44.2 | 18.0 | 1.7 | −.5 | 2.2 | 4.3 | 24.1 | 19.8 | 79.8 |
| 4th quarter | 421.7 | 272.2 | 167.8 | 104.4 | 62.9 | 43.9 | 17.9 | 1.1 | −.1 | 1.2 | 4.6 | 24.5 | 19.9 | 82.0 |
| 1957—1st quarter | 431.4 | 274.9 | 169.1 | 105.7 | 64.3 | 44.2 | 17.8 | 2.3 | .3 | 2.0 | 6.9 | 27.0 | 20.1 | 85.3 |
| 2d quarter | 435.3 | 278.2 | 170.9 | 107.3 | 64.8 | 44.6 | 18.4 | 1.7 | .7 | 1.0 | 6.0 | 26.4 | 20.4 | 86.4 |
| 3d quarter | 439.3 | 282.0 | 173.0 | 109.0 | 64.4 | 44.9 | 18.7 | .8 | .9 | −.1 | 5.9 | 26.6 | 20.7 | 86.9 |
| 4th quarter | 442.8 | 285.6 | 175.0 | 110.6 | 65.5 | 44.9 | 19.0 | 1.5 | 1.1 | .4 | 4.1 | 24.9 | 20.8 | 87.7 |
| 1958—1st quarter | 445.6 | 288.7 | 176.6 | 112.1 | 65.6 | 45.0 | 19.2 | 1.3 | 1.0 | .3 | 1.4 | 22.5 | 21.1 | 89.8 |
| 2d quarter | 453.2 | 293.0 | 179.0 | 114.0 | 66.7 | 44.9 | 19.3 | 2.5 | 1.0 | 1.5 | 1.5 | 22.7 | 21.2 | 92.0 |
| 3d quarter | 462.2 | 297.2 | 181.1 | 116.1 | 68.6 | 45.1 | 19.7 | 3.7 | .9 | 2.8 | 1.4 | 22.9 | 21.5 | 95.1 |
| 4th quarter | 471.1 | 303.0 | 184.1 | 118.9 | 70.6 | 45.9 | 20.2 | 4.5 | .7 | 3.8 | .8 | 22.7 | 21.9 | 96.7 |
| 1959—1st quarter | 473.8 | 305.8 | 185.3 | 120.5 | 71.6 | 46.9 | 20.6 | 4.0 | .2 | 3.8 | −.3 | 22.1 | 22.4 | 96.7 |
| 2d quarter | 476.8 | 307.7 | 186.1 | 121.6 | 72.0 | 47.6 | 20.6 | 3.8 | .1 | 3.7 | −.4 | 22.3 | 22.7 | 97.5 |
| 3d quarter | 482.6 | 311.0 | 187.7 | 123.3 | 72.4 | 48.1 | 20.6 | 3.8 | .0 | 3.8 | 1.1 | 24.0 | 22.9 | 98.1 |
| 4th quarter | 484.9 | 316.0 | 190.3 | 125.7 | 72.0 | 48.3 | 20.6 | 3.1 | .1 | 3.0 | .4 | 23.5 | 23.1 | 96.5 |
| 1960—1st quarter | 492.0 | 319.5 | 192.1 | 127.4 | 73.3 | 48.3 | 21.1 | 3.8 | .1 | 3.7 | 2.3 | 25.6 | 23.3 | 96.9 |
| 2d quarter | 499.1 | 322.6 | 193.7 | 129.0 | 73.7 | 48.7 | 21.3 | 3.8 | .3 | 3.5 | 3.1 | 26.7 | 23.6 | 99.6 |
| 3d quarter | 508.9 | 328.4 | 196.6 | 131.8 | 75.7 | 49.1 | 21.7 | 4.9 | .4 | 4.5 | 2.9 | 26.8 | 23.9 | 101.9 |
| 4th quarter | 514.0 | 333.4 | 199.0 | 134.4 | 75.7 | 49.5 | 22.3 | 3.9 | .3 | 3.6 | 3.3 | 27.6 | 24.3 | 101.6 |
| 1961—1st quarter | 522.1 | 335.8 | 199.9 | 135.9 | 78.2 | 50.0 | 22.3 | 5.9 | .3 | 5.6 | 3.0 | 27.6 | 24.6 | 105.0 |
| 2d quarter | 524.0 | 339.5 | 201.6 | 137.9 | 75.9 | 50.7 | 22.6 | 2.6 | .4 | 2.2 | 1.4 | 26.4 | 25.0 | 107.2 |
| 3d quarter | 528.9 | 342.2 | 202.8 | 139.4 | 75.8 | 50.8 | 22.3 | 2.7 | .4 | 2.3 | 1.8 | 27.0 | 25.2 | 109.0 |
| 4th quarter | 536.4 | 346.0 | 204.6 | 141.4 | 76.4 | 51.0 | 22.2 | 3.2 | .4 | 2.8 | 1.9 | 27.3 | 25.4 | 112.1 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 544.3 | 350.5 | 206.8 | 143.7 | 78.1 | 51.5 | 22.4 | 4.2 | .2 | 4.0 | 1.0 | 26.7 | 25.7 | 114.7 |
| 2d quarter | 553.4 | 355.1 | 209.1 | 146.0 | 80.1 | 52.2 | 22.6 | 5.3 | .2 | 5.1 | 1.0 | 27.0 | 26.0 | 117.2 |
| 3d quarter | 561.0 | 359.5 | 211.2 | 148.3 | 82.3 | 53.1 | 23.1 | 6.1 | .2 | 5.9 | 1.0 | 27.5 | 26.5 | 118.2 |
| 4th quarter | 567.5 | 363.4 | 213.0 | 150.4 | 83.6 | 53.8 | 23.5 | 6.3 | .2 | 6.1 | 1.0 | 27.9 | 26.9 | 119.6 |
| 1963—1st quarter | 573.4 | 367.2 | 214.8 | 152.4 | 84.2 | 54.2 | 23.7 | 6.4 | .2 | 6.2 | 1.0 | 28.3 | 27.3 | 121.0 |
| 2d quarter | 579.0 | 370.7 | 216.5 | 154.1 | 84.9 | 54.8 | 23.9 | 6.3 | .2 | 6.1 | 1.0 | 28.6 | 27.6 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–B–1.—*U.S. economy simulations—Pseudo-realistic situation: Relation of GNP and disposable income*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1953—3d quarter[2] | 367.1 | 26.8 | 340.3 | 30.4 | 0.8 | −0.5 | 307.2 | 37.5 | 8.7 | −0.1 | 12.8 | 5.2 | 9.4 | 289.9 | 32.5 | 3.5 | 253.9 |
| 4th quarter | 364.2 | 27.4 | 336.8 | 30.2 | 1.2 | −.5 | 303.4 | 34.8 | 9.3 | −.1 | 13.5 | 5.2 | 9.5 | 289.1 | 32.2 | 3.6 | 253.4 |
| 1954—1st quarter | 358.6 | 28.0 | 330.6 | 30.0 | 1.0 | −.4 | 297.9 | 31.8 | 8.9 | .0 | 14.7 | 5.2 | 9.6 | 288.0 | 29.8 | 3.6 | 254.6 |
| 2d quarter | 359.4 | 28.5 | 330.9 | 30.0 | −.8 | −.3 | 300.1 | 32.0 | 9.0 | .0 | 15.6 | 5.2 | 9.7 | 290.9 | 29.9 | 3.7 | 257.2 |
| 3d quarter | 365.6 | 29.0 | 336.6 | 30.3 | .8 | −.2 | 304.1 | 33.9 | 9.3 | .0 | 16.1 | 5.2 | 9.8 | 293.1 | 29.8 | 3.9 | 259.5 |
| 4th quarter | 373.4 | 29.5 | 343.8 | 30.7 | 1.7 | .0 | 310.3 | 36.5 | 9.8 | .0 | 16.3 | 5.3 | 10.0 | 296.8 | 30.1 | 4.0 | 262.8 |
| 1955—1st quarter | 382.0 | 30.1 | 351.9 | 31.4 | 3.7 | −.1 | 315.4 | 38.6 | 10.3 | .1 | 16.4 | 5.4 | 10.3 | 299.8 | 30.2 | 4.1 | 265.5 |
| 2d quarter | 388.7 | 30.8 | 358.0 | 32.2 | −.2 | .0 | 324.5 | 40.1 | 10.6 | .5 | 16.5 | 5.5 | 10.5 | 307.2 | 31.3 | 4.2 | 271.7 |
| 3d quarter | 398.8 | 31.5 | 367.3 | 33.1 | 1.2 | .1 | 331.6 | 42.3 | 11.2 | −.6 | 16.5 | 5.6 | 10.9 | 313.2 | 32.1 | 4.3 | 276.7 |
| 4th quarter | 406.3 | 32.2 | 374.1 | 34.1 | −.9 | .2 | 339.5 | 43.6 | 11.6 | .0 | 16.6 | 5.7 | 11.3 | 319.4 | 33.0 | 4.5 | 281.9 |
| 1956—1st quarter | 409.7 | 33.0 | 376.7 | 34.7 | −1.3 | .8 | 342.6 | 42.7 | 11.8 | .0 | 16.9 | 5.8 | 11.6 | 323.9 | 33.5 | 4.6 | 285.8 |
| 2d quarter | 412.1 | 33.7 | 378.4 | 35.1 | −3.3 | .9 | 345.9 | 41.4 | 11.9 | .0 | 17.5 | 5.9 | 11.9 | 329.4 | 34.3 | 4.7 | 290.4 |
| 3d quarter | 417.4 | 34.4 | 383.0 | 35.5 | −2.8 | 1.0 | 349.8 | 40.9 | 12.2 | .0 | 17.9 | 6.0 | 12.1 | 334.1 | 34.8 | 4.8 | 294.5 |
| 4th quarter | 421.7 | 35.0 | 386.7 | 36.0 | −2.2 | 1.1 | 352.3 | 40.7 | 12.5 | .0 | 18.4 | 6.1 | 12.3 | 337.5 | 35.1 | 4.9 | 297.5 |
| 1957—1st quarter | 431.4 | 35.6 | 395.8 | 36.7 | −.2 | 1.2 | 358.7 | 42.6 | 14.0 | .0 | 18.5 | 6.2 | 12.5 | 341.2 | 35.4 | 5.0 | 300.7 |
| 2d quarter | 435.3 | 36.1 | 399.2 | 37.5 | −1.1 | 1.1 | 362.1 | 42.3 | 14.2 | .0 | 19.0 | 6.3 | 12.7 | 345.3 | 35.8 | 5.2 | 304.4 |
| 3d quarter | 439.3 | 36.7 | 402.6 | 37.9 | −.6 | .9 | 364.2 | 41.8 | 14.4 | .0 | 19.5 | 6.5 | 12.8 | 348.7 | 36.1 | 5.3 | 307.3 |
| 4th quarter | 442.8 | 37.2 | 405.6 | 38.4 | −.3 | .8 | 366.5 | 42.0 | 14.6 | .0 | 20.1 | 6.6 | 12.9 | 351.2 | 36.1 | 5.4 | 309.7 |
| 1958—1st quarter | 445.6 | 37.8 | 407.8 | 38.7 | −1.9 | 1.0 | 370.2 | 41.7 | 14.8 | .6 | 20.7 | 6.7 | 13.0 | 355.4 | 36.7 | 5.5 | 313.2 |
| 2d quarter | 453.2 | 38.3 | 414.9 | 39.3 | −1.0 | 1.2 | 376.1 | 43.0 | 15.2 | .6 | 21.1 | 6.9 | 13.0 | 360.1 | 37.2 | 5.6 | 317.3 |
| 3d quarter | 462.2 | 38.8 | 423.4 | 40.2 | −1.9 | 1.2 | 384.6 | 44.7 | 15.7 | −1.3 | 21.4 | 7.1 | 13.2 | 368.9 | 38.8 | 5.8 | 324.4 |
| 4th quarter | 471.1 | 39.4 | 431.7 | 41.1 | −1.4 | 1.2 | 391.4 | 46.0 | 16.2 | .0 | 21.6 | 7.3 | 13.4 | 373.1 | 39.2 | 5.9 | 328.0 |
| 1959—1st quarter | 473.8 | 40.0 | 433.8 | 41.8 | −.9 | .7 | 391.8 | 45.4 | 16.8 | .0 | 22.1 | 7.5 | 13.5 | 374.6 | 39.1 | 6.0 | 329.5 |
| 2d quarter | 476.8 | 40.6 | 436.2 | 42.1 | −.9 | .5 | 393.7 | 44.9 | 16.9 | .0 | 22.8 | 7.6 | 13.7 | 377.5 | 39.3 | 6.1 | 332.4 |
| 3d quarter | 482.6 | 41.2 | 441.4 | 42.6 | −2.8 | .3 | 400.1 | 45.2 | 17.3 | .0 | 23.4 | 7.8 | 13.8 | 384.5 | 40.4 | 6.2 | 337.9 |
| 4th quarter | 484.9 | 41.8 | 443.1 | 43.1 | −1.8 | .3 | 400.3 | 44.4 | 17.4 | .0 | 24.1 | 8.0 | 13.9 | 386.4 | 40.3 | 6.3 | 339.8 |
| 1960—1st quarter | 492.0 | 42.4 | 449.6 | 43.5 | −1.1 | .5 | 405.9 | 45.3 | 19.4 | .0 | 24.6 | 8.3 | 14.0 | 389.8 | 40.1 | 6.4 | 343.2 |
| 2d quarter | 499.1 | 43.0 | 456.2 | 44.3 | −2.9 | .6 | 413.5 | 45.8 | 19.8 | .0 | 25.1 | 8.5 | 14.1 | 397.4 | 41.5 | 6.6 | 349.3 |
| 3d quarter | 508.9 | 43.5 | 465.4 | 45.2 | −4.0 | .5 | 422.9 | 47.5 | 20.4 | .0 | 25.4 | 8.8 | 14.2 | 405.1 | 42.9 | 6.7 | 355.5 |
| 4th quarter | 514.0 | 44.1 | 469.9 | 46.1 | −2.9 | .5 | 425.4 | 47.1 | 20.7 | .0 | 25.9 | 9.1 | 14.3 | 408.7 | 43.2 | 6.8 | 358.6 |
| 1961—1st quarter | 522.1 | 44.7 | 477.4 | 46.8 | −2.6 | .6 | 431.9 | 48.8 | 21.1 | .0 | 26.3 | 9.4 | 14.4 | 414.0 | 44.1 | 6.9 | 363.0 |
| 2d quarter | 524.0 | 45.3 | 478.7 | 47.4 | −1.7 | .6 | 431.7 | 46.4 | 21.2 | .0 | 27.1 | 9.6 | 14.5 | 417.1 | 44.3 | 7.0 | 365.8 |
| 3d quarter | 528.9 | 45.9 | 483.0 | 47.7 | −1.7 | .6 | 435.7 | 46.4 | 21.5 | .0 | 27.8 | 9.9 | 14.5 | 421.9 | 45.0 | 7.2 | 369.7 |
| 4th quarter | 536.4 | 46.4 | 490.0 | 48.4 | −1.7 | .6 | 442.0 | 47.3 | 21.9 | .0 | 28.3 | 10.3 | 14.6 | 428.0 | 46.0 | 7.3 | 374.7 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 544.3 | 47.0 | 497.3 | 49.2 | −2.5 | .6 | 449.3 | 48.4 | 22.4 | .0 | 28.8 | 10.6 | 14.8 | 434.6 | 47.2 | 7.4 | 380.0 |
| 2d quarter | 553.4 | 47.5 | 505.8 | 50.2 | −2.5 | .6 | 456.9 | 49.8 | 22.9 | .0 | 29.2 | 11.0 | 14.9 | 441.3 | 48.4 | 7.6 | 385.3 |
| 3d quarter | 561.0 | 48.1 | 512.9 | 51.1 | −2.5 | .6 | 463.0 | 50.7 | 23.3 | .0 | 29.7 | 11.4 | 15.1 | 447.1 | 49.3 | 7.7 | 390.0 |
| 4th quarter | 567.5 | 48.8 | 518.8 | 51.9 | −2.5 | .6 | 468.1 | 51.1 | 23.7 | .0 | 30.2 | 11.8 | 15.2 | 452.6 | 50.3 | 7.8 | 394.5 |
| 1963—1st quarter | 573.4 | 49.4 | 524.0 | 52.5 | −1.7 | .6 | 471.9 | 51.2 | 24.0 | .0 | 30.9 | 12.3 | 15.4 | 457.1 | 50.9 | 7.9 | 398.3 |
| 2d quarter | 579.0 | 50.0 | 529.0 | 53.2 | −1.7 | .6 | 476.2 | 51.2 | 24.3 | .0 | 31.6 | 12.7 | 15.5 | 462.4 | 51.8 | 8.0 | 402.6 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–A–2.—*U.S. economy simulations—Tax reduction policy: Gross national product demands*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | | | | |
| | | Total | Goods | Services | | | | Total | Farm | Nonfarm | Total | Exports | Imports | |
| 1953—3d quarter [1] | 367.1 | 234.1 | 151.3 | 82.8 | 51.2 | 36.7 | 13.8 | 0.7 | −0.8 | 1.5 | −0.8 | 16.7 | 17.5 | 82.7 |
| 4th quarter | 364.2 | 232.2 | 148.5 | 83.7 | 49.3 | 37.2 | 14.6 | −2.5 | −.3 | −2.2 | −.8 | 16.7 | 17.5 | 83.5 |
| 1954—1st quarter | 362.8 | 237.3 | 151.5 | 85.8 | 47.4 | 36.6 | 14.7 | −3.9 | .2 | −4.1 | −1.4 | 16.0 | 17.4 | 79.4 |
| 2d quarter | 363.4 | 240.4 | 153.3 | 87.1 | 47.9 | 36.2 | 14.6 | −3.0 | .5 | −3.5 | .7 | 17.9 | 17.2 | 74.4 |
| 3d quarter | 368.5 | 244.0 | 155.3 | 88.6 | 50.3 | 35.9 | 15.4 | −.9 | .7 | −1.6 | .1 | 17.3 | 17.2 | 74.1 |
| 4th quarter | 375.4 | 247.1 | 157.1 | 90.0 | 53.9 | 36.2 | 16.1 | 1.6 | .6 | 1.0 | 1.4 | 18.7 | 17.3 | 73.0 |
| 1955—1st quarter | 383.8 | 251.0 | 159.3 | 91.7 | 57.1 | 37.0 | 16.8 | 3.3 | .6 | 2.7 | 1.1 | 18.7 | 17.6 | 74.6 |
| 2d quarter | 390.8 | 254.5 | 161.2 | 93.3 | 60.9 | 38.3 | 17.7 | 4.9 | .4 | 4.5 | .6 | 18.6 | 18.0 | 74.9 |
| 3d quarter | 402.0 | 260.2 | 164.2 | 96.0 | 64.5 | 39.7 | 18.1 | 6.6 | .2 | 6.4 | 1.5 | 20.0 | 18.5 | 75.8 |
| 4th quarter | 410.9 | 264.4 | 166.3 | 98.2 | 68.1 | 41.6 | 18.7 | 7.8 | .0 | 7.8 | 1.3 | 20.3 | 19.0 | 77.1 |
| 1956—1st quarter | 415.6 | 268.5 | 168.1 | 100.3 | 68.7 | 43.4 | 18.9 | 6.4 | −.3 | 6.7 | 1.8 | 21.4 | 19.6 | 76.6 |
| 2d quarter | 418.9 | 271.3 | 169.3 | 102.0 | 67.6 | 44.5 | 18.7 | 4.4 | −.7 | 5.1 | 2.7 | 22.6 | 19.9 | 77.3 |
| 3d quarter | 424.8 | 274.8 | 171.0 | 103.8 | 66.2 | 45.1 | 18.4 | 2.7 | −.5 | 3.2 | 4.0 | 24.1 | 20.1 | 79.8 |
| 4th quarter | 429.4 | 278.0 | 172.6 | 105.4 | 65.2 | 44.9 | 18.3 | 2.0 | −.1 | 2.1 | 4.2 | 24.5 | 20.3 | 82.0 |
| 1957—1st quarter | 439.1 | 28 .9 | 174.1 | 106.8 | 66.4 | 45.2 | 18.1 | 3.1 | .3 | 2.8 | 6.5 | 27.0 | 20.5 | 85.3 |
| 2d quarter | 443.2 | 284.5 | 176.2 | 108.4 | 66.7 | 45.6 | 18.6 | 2.5 | .7 | 1.8 | 5.6 | 26.4 | 20.8 | 86.4 |
| 3d quarter | 447.4 | 288.8 | 178.7 | 110.2 | 66.1 | 45.8 | 18.8 | 1.5 | .9 | .6 | 5.5 | 26.6 | 21.1 | 86.9 |
| 4th quarter | 451.3 | 292.8 | 181.0 | 111.9 | 67.2 | 45.8 | 19.1 | 2.3 | 1.1 | 1.2 | 3.6 | 24.9 | 21.3 | 87.7 |
| 1958—1st quarter | 454.5 | 296.4 | 183.0 | 113.4 | 67.3 | 45.9 | 19.2 | 2.2 | 1.0 | 1.2 | 1.0 | 22.5 | 21.5 | 89.8 |
| 2d quarter | 462.7 | 301.2 | 185.7 | 115.5 | 68.5 | 45.8 | 19.3 | 3.4 | 1.0 | 2.4 | 1.0 | 22.7 | 21.7 | 92.0 |
| 3d quarter | 472.3 | 305.9 | 188.2 | 117.7 | 70.4 | 46.0 | 19.8 | 4.7 | .9 | 3.8 | .9 | 22.9 | 22.0 | 95.1 |
| 4th quarter | 481.8 | 312.3 | 191.6 | 120.7 | 72.5 | 46.8 | 20.3 | 5.4 | .7 | 4.7 | .2 | 22.7 | 22.5 | 96.7 |
| 1959—1st quarter | 484.8 | 315.4 | 193.0 | 122.4 | 73.5 | 47.8 | 20.8 | 4.9 | .2 | 4.7 | −.8 | 22.1 | 22.9 | 96.7 |
| 2d quarter | 488.0 | 317.5 | 193.9 | 123.6 | 73.9 | 48.5 | 20.8 | 4.6 | .1 | 4.5 | −.9 | 22.3 | 23.2 | 97.5 |
| 3d quarter | 493.9 | 321.1 | 195.8 | 125.3 | 74.2 | 49.0 | 20.7 | 4.5 | .0 | 4.5 | .5 | 24.0 | 23.5 | 98.1 |
| 4th quarter | 496.4 | 326.5 | 198.6 | 127.9 | 73.6 | 49.1 | 20.7 | 3.8 | .1 | 3.7 | −.2 | 23.5 | 23.7 | 96.5 |
| 1960—1st quarter | 503.7 | 330.4 | 200.7 | 129.7 | 74.7 | 49.2 | 21.1 | 4.4 | .1 | 4.3 | 1.7 | 25.6 | 23.9 | 96.9 |
| 2d quarter | 511.0 | 333.8 | 202.5 | 131.3 | 75.1 | 49.5 | 21.3 | 4.3 | .3 | 4.0 | 2.5 | 26.7 | 24.2 | 99.6 |
| 3d quarter | 521.2 | 340.1 | 205.8 | 134.3 | 76.9 | 49.8 | 21.6 | 5.5 | .4 | 5.1 | 2.3 | 26.8 | 24.5 | 101.9 |
| 4th quarter | 526.8 | 345.6 | 203.4 | 137.1 | 76.9 | 50.2 | 22.2 | 4.5 | .3 | 4.2 | 2.7 | 27.6 | 24.9 | 101.6 |
| 1961—1st quarter | 535.2 | 348.4 | 209.6 | 138.8 | 79.5 | 50.7 | 22.2 | 6.5 | .3 | 6.2 | 2.4 | 27 6 | 25.2 | 105.0 |
| 2d quarter | 537.4 | 352.4 | 211.4 | 140.9 | 77.1 | 51.4 | 22.5 | 3.1 | .4 | 2.7 | .7 | 26.4 | 25.7 | 107.2 |
| 3d quarter | 542 5 | 355.4 | 212.9 | 142.5 | 77.0 | 51.5 | 22.3 | 3.2 | .4 | 2.8 | 1.2 | 27.0 | 25.8 | 109.0 |
| 4th quarter | 550.3 | 359.5 | 214.9 | 144.6 | 77.5 | 51.7 | 22.1 | 3.7 | .4 | 3.3 | 1.2 | 27.3 | 26.1 | 112.1 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 559.3 | 364.4 | 217.3 | 147.0 | 79.2 | 52.2 | 22.3 | 4.7 | .2 | 4.5 | 1.0 | 27.4 | 26.4 | 114.7 |
| 2d quarter | 569.1 | 369.6 | 219.9 | 149.7 | 81.2 | 52.8 | 22.6 | 5.8 | .2 | 5.6 | 1.0 | 27.7 | 26.7 | 117.2 |
| 3d quarter | 577.2 | 374.4 | 222.3 | 152.2 | 83.5 | 53.8 | 23.0 | 6.7 | .2 | 6.5 | 1.0 | 28.2 | 27.2 | 118.2 |
| 4th quarter | 584.0 | 378.6 | 224.3 | 154.3 | 84.8 | 54.5 | 23.4 | 6.8 | .2 | 6.6 | 1.0 | 28.7 | 27.7 | 119.6 |
| 1963—1st quarter | 590.1 | 382.7 | 226.3 | 156.4 | 85.4 | 54.9 | 23.6 | 6.9 | .2 | 6.7 | 1.0 | 29.1 | 28.1 | 121.0 |
| 2d quarter | 596.0 | 386.6 | 228.2 | 158.4 | 86.0 | 55.5 | 23.7 | 6.8 | .2 | 6.6 | 1.0 | 29.5 | 28.5 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–B–2.—*U.S. economy simulation—Tax reduction policy: Relation of GNP and disposable income*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income [1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income [1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1953—3d quarter [2] | 367.1 | 26.8 | 340.3 | 30.4 | 0.8 | −0.5 | 307.2 | 37.5 | 8.7 | −0.1 | 12.8 | 5.2 | 9.4 | 289.9 | 32.5 | 3.5 | 253.9 |
| 4th quarter | 364.2 | 27.4 | 336.8 | 30.2 | 1.2 | −.5 | 303.4 | 34.8 | 9.3 | −.1 | 13.5 | 5.2 | 9.5 | 289.1 | 26.5 | 3.6 | 259.0 |
| 1954—1st quarter | 362.8 | 28.0 | 334.7 | 30.2 | 1.0 | −.4 | 301.9 | 33.1 | 9.2 | .0 | 14.5 | 5.2 | 9.6 | 290.2 | 25.0 | 3.7 | 261.6 |
| 2d quarter | 363.4 | 28.5 | 334.8 | 30.2 | −.8 | −.3 | 303.8 | 33.1 | 9.2 | .0 | 15.3 | 5.2 | 9.7 | 293.1 | 25.1 | 3.8 | 264.3 |
| 3d quarter | 368.5 | 29.1 | 339.5 | 30.4 | .8 | −.2 | 306.8 | 34.7 | 9.5 | .0 | 15.8 | 5.3 | 9.9 | 294.8 | 24.9 | 3.9 | 266.1 |
| 4th quarter | 375.4 | 29.6 | 345.7 | 30.8 | 1.7 | .0 | 312.1 | 36.8 | 9.9 | .0 | 16.1 | 5.4 | 10.1 | 298.1 | 25.0 | 4.0 | 269.1 |
| 1955—1st quarter | 383.8 | 30.2 | 353.6 | 31.6 | 3.7 | −.1 | 316.9 | 38.9 | 10.4 | .1 | 16.2 | 5.5 | 10.3 | 300.9 | 25.1 | 4.1 | 271.7 |
| 2d quarter | 390.8 | 30.9 | 360.0 | 32.4 | −.2 | .0 | 326.3 | 40.5 | 10.7 | .5 | 16.4 | 5.6 | 10.6 | 308.5 | 26.1 | 4.2 | 278.2 |
| 3d quarter | 402.0 | 31.5 | 370.4 | 33.4 | 1.2 | .1 | 334.4 | 43.1 | 11.4 | −.6 | 16.3 | 5.7 | 11.0 | 315.0 | 26.8 | 4.3 | 283.8 |
| 4th quarter | 410.9 | 32.3 | 378.6 | 34.5 | −.9 | .2 | 343.7 | 44.8 | 11.9 | .0 | 16.3 | 5.8 | 11.4 | 321.9 | 27.7 | 4.5 | 289.7 |
| 1956—1st quarter | 415.6 | 33.1 | 382.5 | 35.3 | −1.3 | .8 | 347.8 | 44.3 | 12.1 | .0 | 16.5 | 5.9 | 11.8 | 327.1 | 28.3 | 4.6 | 294.2 |
| 2d quarter | 418.9 | 33.8 | 385.1 | 35.8 | −3.3 | .9 | 351.9 | 43.1 | 12.3 | .0 | 17.0 | 6.0 | 12.1 | 333.1 | 29.0 | 4.7 | 299.4 |
| 3d quarter | 424.8 | 34.5 | 390.3 | 36.2 | −2.8 | 1.0 | 356.2 | 42.7 | 12.6 | .0 | 17.4 | 6.1 | 12.3 | 338.3 | 29.5 | 4.9 | 303.9 |
| 4th quarter | 429.4 | 35.2 | 394.2 | 36.8 | −2.2 | 1.1 | 359.0 | 42.4 | 12.9 | .0 | 17.8 | 6.2 | 12.5 | 342.0 | 29.8 | 5.0 | 307.2 |
| 1957—1st quarter | 439.1 | 35.7 | 403.4 | 37.6 | −.2 | 1.2 | 365.4 | 44.2 | 14.4 | .0 | 18.0 | 6.4 | 12.8 | 345.8 | 30.1 | 5.1 | 310.7 |
| 2d quarter | 443.2 | 36.3 | 406.9 | 38.4 | −1.1 | 1.1 | 368.9 | 43.8 | 14.7 | .0 | 18.4 | 6.5 | 13.0 | 350.2 | 30.5 | 5.2 | 314.5 |
| 3d quarter | 447.4 | 36.8 | 410.5 | 38.8 | −.6 | .9 | 371.3 | 43.2 | 14.9 | .0 | 19.0 | 6.7 | 13.1 | 353.8 | 30.8 | 5.3 | 317.8 |
| 4th quarter | 451.3 | 37.4 | 413.9 | 39.3 | −.3 | .8 | 373.9 | 43.5 | 15.1 | .0 | 19.6 | 6.8 | 13.3 | 356.8 | 30.9 | 5.4 | 320.4 |
| 1958—1st quarter | 454.5 | 37.9 | 416.6 | 39.7 | −1.9 | 1.0 | 378.0 | 43.2 | 15.3 | .6 | 20.2 | 7.0 | 13.3 | 361.3 | 31.4 | 5.5 | 324.3 |
| 2d quarter | 462.7 | 38.4 | 424.3 | 40.3 | −1.0 | 1.2 | 384.4 | 44.6 | 15.7 | .6 | 20.6 | 7.1 | 13.4 | 366.4 | 32.0 | 5.7 | 328.8 |
| 3d quarter | 472.3 | 39.0 | 433.3 | 41.2 | −1.9 | 1.2 | 393.4 | 46.3 | 16.3 | −1.3 | 20.8 | 7.3 | 13.6 | 375.7 | 33.4 | 5.8 | 336.5 |
| 4th quarter | 481.8 | 39.5 | 442.2 | 42.3 | −1.4 | 1.2 | 400.7 | 47.7 | 16.8 | .0 | 21.1 | 7.5 | 13.8 | 380.4 | 33.8 | 5.9 | 340.6 |
| 1959—1st quarter | 484.8 | 40.2 | 444.6 | 43.0 | −.9 | .7 | 401.4 | 47.1 | 17.4 | .0 | 21.6 | 7.7 | 14.0 | 382.2 | 33.8 | 6.0 | 342.4 |
| 2d quarter | 488.0 | 40.8 | 447.2 | 43.3 | −.9 | .5 | 403.5 | 46.5 | 17.6 | .0 | 22.3 | 7.9 | 14.1 | 385.6 | 34.0 | 6.1 | 345.5 |
| 3d quarter | 493.9 | 41.4 | 452.5 | 43.8 | −2.8 | .3 | 410.0 | 46.6 | 17.9 | .0 | 22.9 | 8.2 | 14.3 | 392.6 | 35.0 | 6.3 | 351.4 |
| 4th quarter | 496.4 | 42.0 | 454.4 | 44.3 | −1.8 | .3 | 410.4 | 45.7 | 18.0 | .0 | 23.7 | 8.4 | 14.3 | 394.9 | 35.0 | 6.4 | 353.5 |
| 1960—1st quarter | 503.7 | 42.5 | 461.2 | 44.8 | −1.1 | .5 | 416.2 | 46.6 | 20.1 | .0 | 24.3 | 8.6 | 14.4 | 398.6 | 34.9 | 6.5 | 357.2 |
| 2d quarter | 511.0 | 43.1 | 467.9 | 45.6 | −2.9 | .6 | 424.0 | 47.1 | 20.5 | .0 | 24.8 | 8.9 | 14.5 | 406.4 | 36.1 | 6.6 | 363.7 |
| 3d quarter | 521.2 | 43.7 | 477.6 | 46.6 | −4.0 | .5 | 433.7 | 48.8 | 21.1 | .0 | 25.1 | 9.2 | 14.6 | 414.6 | 37.4 | 6.8 | 370.4 |
| 4th quarter | 526.8 | 44.2 | 482.5 | 47.4 | −2.9 | .5 | 436.7 | 48.3 | 21.4 | .0 | 25.6 | 9.5 | 14.7 | 418.6 | 37.7 | 6.9 | 374.0 |
| 1961—1st quarter | 535.2 | 44.8 | 490.4 | 48.2 | −2.6 | .6 | 443.5 | 50.0 | 21.9 | .0 | 26.1 | 9.8 | 14.9 | 424.3 | 38.5 | 7.0 | 378.8 |
| 2d quarter | 537.4 | 45.4 | 492.0 | 48.8 | −1.7 | .6 | 443.6 | 47.6 | 22.0 | .0 | 26.9 | 10.1 | 14.9 | 427.8 | 38.8 | 7.1 | 381.9 |
| 3d quarter | 542.5 | 46.0 | 496.5 | 49.2 | −1.7 | .6 | 447.7 | 47.6 | 22.3 | .0 | 27.6 | 10.4 | 15.0 | 432.8 | 39.4 | 7.2 | 386.2 |
| 4th quarter | 550.3 | 46.5 | 503.8 | 49.9 | −1.7 | .6 | 454.3 | 48.3 | 22.7 | .0 | 28.2 | 10.8 | 15.1 | 439.3 | 40.4 | 7.4 | 391.5 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 559.3 | 47.1 | 512.2 | 50.8 | −2.5 | .6 | 462.6 | 49.6 | 23.2 | .0 | 28.7 | 11.2 | 15.2 | 446.7 | 41.5 | 7.5 | 397.7 |
| 2d quarter | 569.1 | 47.6 | 521.4 | 51.8 | −2.5 | .6 | 470.8 | 51.1 | 23.7 | .0 | 29.1 | 11.6 | 15.4 | 453.9 | 42.6 | 7.6 | 403.6 |
| 3d quarter | 577.2 | 48.2 | 528.9 | 52.8 | −2.5 | .6 | 477.3 | 52.1 | 24.2 | .0 | 29.6 | 12.0 | 15.5 | 460.1 | 43.6 | 7.8 | 408.8 |
| 4th quarter | 584.0 | 48.8 | 535.1 | 53.6 | −2.5 | .6 | 482.7 | 52.3 | 24.6 | .0 | 30.2 | 12.5 | 15.7 | 466.0 | 44.4 | 7.9 | 413.7 |
| 1963—1st quarter | 590.1 | 49.5 | 540.7 | 54.4 | −1.7 | .6 | 486.7 | 52.4 | 24.9 | .0 | 30.9 | 12.9 | 15.8 | 470.9 | 45.1 | 8.0 | 417.9 |
| 2d quarter | 596.0 | 50.1 | 545.9 | 55.0 | −1.7 | .6 | 491.3 | 52.3 | 25.3 | .0 | 31.6 | 13.4 | 16.0 | 476.6 | 45.9 | 8.1 | 422.6 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II-A-3.—*U.S. economy simulations—Inventory fluctuation reduction policy: Gross national product demands*

RECESSION OF 1953-54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1953—3d quarter [1] | 367.1 | 234.1 | 151.3 | 82.8 | 51.2 | 36.7 | 13.8 | 0.7 | −0.8 | 1.5 | −0.8 | 16.7 | 17.5 | 82.7 |
| 4th quarter | 365.3 | 232.2 | 148.5 | 83.7 | 50.4 | 37.2 | 14.6 | −1.4 | −.3 | −1.1 | −.8 | 16.7 | 17.5 | 83.5 |
| 1954—1st quarter | 361.2 | 234.1 | 149.7 | 84.4 | 49.2 | 36.8 | 14.8 | −2.3 | .2 | −2.5 | −1.4 | 16.0 | 17.4 | 79.4 |
| 2d quarter | 361.9 | 237.7 | 151.9 | 85.8 | 49.2 | 36.4 | 14.5 | −1.7 | .5 | −2.2 | .6 | 17.9 | 17.3 | 74.4 |
| 3d quarter | 367.1 | 242.2 | 154.5 | 87.7 | 50.6 | 36.0 | 15.3 | −.7 | .7 | −1.4 | .1 | 17.3 | 17.2 | 74.1 |
| 4th quarter | 373.1 | 245.9 | 156.5 | 89.4 | 52.8 | 36.2 | 16.0 | .6 | .6 | .0 | 1.4 | 18.7 | 17.3 | 73.0 |
| 1955—1st quarter | 380.4 | 249.9 | 158.5 | 91.3 | 54.8 | 36.7 | 16.6 | 1.5 | .6 | .9 | 1.2 | 18 7 | 17.5 | 74.6 |
| 2d quarter | 385.9 | 252.9 | 159.9 | 93.0 | 57.4 | 37.7 | 17.5 | 2.2 | .4 | 1.8 | .7 | 18.6 | 17.9 | 74.9 |
| 3d quarter | 395.0 | 257.7 | 162.2 | 95.5 | 59.6 | 38.8 | 17.9 | 3.0 | .2 | 2.8 | 1.8 | 20.0 | 18.2 | 75.8 |
| 4th quarter | 401.9 | 260.9 | 163.4 | 97.5 | 62.1 | 40.3 | 18.3 | 3.6 | .0 | 3.6 | 1.7 | 20.3 | 18.6 | 77.1 |
| 1956—1st quarter | 406.1 | 264.0 | 164.6 | 99.4 | 63.1 | 41.7 | 18.5 | 2.9 | −.3 | 3.2 | 2.4 | 21.4 | 19.0 | 76.6 |
| 2d quarter | 409.9 | 266.4 | 165.4 | 101.0 | 62.9 | 42.6 | 18.3 | 2.0 | 1.7 | 2.7 | 3.3 | 22.6 | 19.3 | 77.3 |
| 3d quarter | 416.8 | 269.5 | 166.7 | 102.8 | 62.9 | 43.4 | 18.1 | 1.5 | −.5 | 2.0 | 4.6 | 24.1 | 19.5 | 79.8 |
| 4th quarter | 422.3 | 272.5 | 168.0 | 104.4 | 63.1 | 43.4 | 18.2 | 1.5 | −.1 | 1.6 | 4.8 | 24.5 | 19.7 | 82.0 |
| 1957—1st quarter | 431.9 | 275.1 | 169.3 | 105.8 | 64.5 | 44.0 | 18.2 | 2.3 | .3 | 2.0 | 7.0 | 27.0 | 20.0 | 85.3 |
| 2d quarter | 436.3 | 278.3 | 170.9 | 107.3 | 65.6 | 44.7 | 18.8 | 2.1 | .7 | 1.4 | 6.0 | 26.4 | 20.4 | 86.4 |
| 3d quarter | 440.7 | 282.0 | 172.9 | 109.1 | 65.8 | 45.1 | 19.0 | 1.7 | .9 | .8 | 5.9 | 26.6 | 20.7 | 86.9 |
| 4th quarter | 443.8 | 285.5 | 174.8 | 110.6 | 66.6 | 45.3 | 19.3 | 2.1 | 1.1 | 1.0 | 4.0 | 24.9 | 20.9 | 87.7 |
| 1958—1st quarter | 446.2 | 288.5 | 176.5 | 112.0 | 66.6 | 45.4 | 19.3 | 1.9 | 1.0 | .9 | 1.4 | 22.5 | 21.1 | 89.8 |
| 2d quarter | 453.1 | 292.8 | 178.8 | 114.0 | 66.9 | 45.3 | 19.2 | 2.4 | 1.0 | 1.4 | 1.4 | 22.7 | 21.3 | 92.0 |
| 3d quarter | 461.3 | 297.0 | 181.0 | 116.0 | 67.9 | 45.4 | 19.5 | 3.0 | .9 | 2.1 | 1.3 | 22.9 | 21.6 | 95.1 |
| 4th quarter | 469.5 | 302.9 | 184.0 | 118.9 | 69.2 | 45.9 | 20.0 | 3.3 | .7 | 2.6 | .8 | 22.7 | 21.9 | 96.7 |
| 1959—1st quarter | 472.2 | 305.6 | 185.2 | 120.5 | 70.1 | 46.7 | 20.4 | 2.9 | .2 | 2.7 | −.2 | 22.1 | 22.3 | 96.7 |
| 2d quarter | 475.5 | 307.6 | 186.0 | 121.6 | 70.7 | 47.3 | 20.5 | 2.9 | .1 | 2.8 | −.2 | 22.3 | 22.5 | 97.5 |
| 3d quarter | 481.5 | 310.9 | 187.7 | 123.2 | 71.2 | 47.7 | 20.5 | 2.9 | .0 | 2.9 | 1.2 | 24.0 | 22.8 | 98.1 |
| 4th quarter | 484.4 | 316.0 | 190.3 | 125.7 | 71.4 | 48.0 | 20.7 | 2.7 | .1 | 2.6 | .5 | 23.5 | 23.0 | 96.5 |
| 1960—1st quarter | 491.3 | 319.5 | 192.1 | 127.4 | 72.5 | 48.1 | 21.3 | 3.1 | .1 | 3.0 | 2.4 | 25.6 | 23.2 | 96.9 |
| 2d quarter | 498.6 | 322.6 | 193.6 | 129.0 | 73.2 | 48.5 | 21.5 | 3.2 | .3 | 2.9 | 3.2 | 26.7 | 23.5 | 99.6 |
| 3d quarter | 507.9 | 328.3 | 196.5 | 131.8 | 74.6 | 48.9 | 21.8 | 3.9 | .4 | 3.5 | 3.0 | 26.8 | 23.8 | 101.9 |
| 4th quarter | 513.3 | 333.2 | 198.8 | 134.4 | 75.1 | 49.3 | 22.3 | 3.4 | .3 | 3.1 | 3.4 | 27.6 | 24.2 | 101.6 |
| 1961—1st quarter | 520.4 | 335.7 | 199.8 | 135.9 | 76.7 | 49.9 | 22.3 | 4.5 | .3 | 4.2 | 3.1 | 27.6 | 24.5 | 105.0 |
| 2d quarter | 523.9 | 339.2 | 201.4 | 137.9 | 75.9 | 50.5 | 22.5 | 2.9 | .4 | 2.5 | 1.5 | 26.4 | 24.9 | 107.2 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3d quarter | 529.1 | 342.1 | 202.7 | 139.4 | 76.1 | 50.7 | 22.3 | 3.0 | .4 | 2.6 | 1.9 | 27.0 | 25.1 | 109.0 |
| 4th quarter | 536.5 | 345.9 | 204.6 | 141.4 | 76.6 | 51.1 | 22.2 | 3.3 | .4 | 2.9 | 2.0 | 27.3 | 25.3 | 112.1 |
| 1962—1st quarter | 543.9 | 350.4 | 206.7 | 143.7 | 77.8 | 51.6 | 22.4 | 3.7 | .2 | 3.5 | 1.0 | 26.6 | 25.6 | 114.7 |
| 2d quarter | 552.4 | 355.0 | 209.0 | 146.0 | 79.2 | 52.2 | 22.7 | 4.3 | .2 | 4.1 | 1.0 | 27.0 | 26.0 | 117.2 |
| 3d quarter | 559.4 | 359.4 | 211.1 | 148.3 | 80.9 | 53.0 | 23.1 | 4.8 | .2 | 4.6 | 1.0 | 27.4 | 26.4 | 118.2 |
| 4th quarter | 565.7 | 363.1 | 212.8 | 150.3 | 82.0 | 53.6 | 23.4 | 4.9 | .2 | 4.7 | 1.0 | 27.8 | 26.8 | 119.6 |
| 1963—1st quarter | 571.5 | 366.9 | 214.6 | 152.3 | 82.6 | 53.9 | 23.7 | 5.1 | .2 | 4.9 | 1.0 | 28.1 | 27.1 | 121.0 |
| 2d quarter | 577.2 | 370.4 | 216.4 | 154.0 | 83.4 | 54.4 | 23.8 | 5.2 | .2 | 5.0 | 1.0 | 28.5 | 27.5 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–B–3.—*U.S. economy simulations—Inventory fluctuation reduction policy: Relation of GNP and disposable income*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1953—3d quarter[2] | 367.1 | 26.8 | 340.3 | 30.4 | 0.8 | −0.5 | 307.2 | 37.5 | 8.7 | −0.1 | 12.8 | 5.2 | 9.4 | 289.9 | 32.5 | 3.5 | 253.9 |
| 4th quarter | 365.3 | 27.4 | 337.9 | 30.3 | 1.2 | −.5 | 304.5 | 35.6 | 9.3 | −.1 | 13.4 | 5.2 | 9.5 | 289.3 | 32.2 | 3.6 | 253.5 |
| 1954—1st quarter | 361.2 | 28.0 | 333.2 | 30.1 | 1.0 | −.4 | 300.4 | 33.6 | 9.1 | .0 | 14.6 | 5.2 | 9.7 | 288.5 | 29.9 | 3.6 | 255.0 |
| 2d quarter | 361.9 | 28.6 | 333.3 | 30.1 | −.8 | −.3 | 302.4 | 33.4 | 9.1 | .0 | 15.4 | 5.2 | 9.8 | 291.6 | 30.0 | 3.8 | 257.8 |
| 3d quarter | 367.1 | 29.1 | 338.0 | 30.4 | .8 | −.2 | 305.4 | 34.5 | 9.4 | .0 | 15.9 | 5.3 | 9.9 | 293.8 | 30.0 | 3.9 | 260.0 |
| 4th quarter | 373.1 | 29.6 | 343.5 | 30.7 | 1.7 | .0 | 309.9 | 35.9 | 9.8 | .0 | 16.3 | 5.3 | 10.1 | 297.2 | 30.1 | 4.0 | 263.1 |
| 1955—1st quarter | 380.4 | 30.2 | 350.2 | 31.3 | 3.7 | −.1 | 313.8 | 37.3 | 10.2 | .1 | 16.5 | 5.4 | 10.3 | 299.8 | 30.2 | 4.1 | 265.5 |
| 2d quarter | 385.9 | 30.8 | 355.1 | 32.0 | −.2 | .0 | 321.9 | 38.2 | 10.5 | .5 | 16.7 | 5.5 | 10.5 | 306.9 | 31.2 | 4.2 | 271.4 |
| 3d quarter | 395.0 | 31.5 | 363.5 | 32.8 | 1.2 | .1 | 328.1 | 39.9 | 11.0 | −.6 | 16.8 | 5.6 | 10.8 | 312.6 | 32.0 | 4.3 | 276.3 |
| 4th quarter | 401.9 | 32.2 | 369.7 | 33.7 | −.9 | .2 | 335.6 | 41.0 | 11.4 | .0 | 17.0 | 5.7 | 11.1 | 318.6 | 32.8 | 4.5 | 281.3 |
| 1956—1st quarter | 406.1 | 32.9 | 373.2 | 34.3 | −1.3 | .8 | 339.6 | 40.8 | 11.6 | .0 | 17.3 | 5.8 | 11.4 | 323.1 | 33.3 | 4.6 | 285.2 |
| 2d quarter | 409.9 | 33.6 | 376.3 | 34.7 | −3.3 | .9 | 344.2 | 40.4 | 11.8 | .0 | 17.7 | 5.9 | 11.7 | 328.9 | 34.1 | 4.7 | 290.1 |
| 3d quarter | 416.8 | 34.2 | 382.6 | 35.3 | −2.8 | 1.0 | 349.5 | 40.8 | 12.2 | .0 | 18.0 | 6.0 | 11.8 | 334.0 | 34.8 | 4.8 | 294.4 |
| 4th quarter | 422.3 | 34.9 | 387.4 | 36.0 | −2.2 | 1.1 | 353.0 | 41.2 | 12.5 | .0 | 18.4 | 6.2 | 12.1 | 337.7 | 35.1 | 4.9 | 297.6 |
| 1957—1st quarter | 431.9 | 35.5 | 396.5 | 36.8 | −.2 | 1.2 | 359.3 | 42.8 | 14.0 | .0 | 18.5 | 6.3 | 12.3 | 341.3 | 35.4 | 5.0 | 300.9 |
| 2d quarter | 436.3 | 36.1 | 400.2 | 37.6 | −1.1 | 1.1 | 363.0 | 42.8 | 14.3 | .0 | 18.9 | 6.4 | 12.5 | 345.6 | 35.9 | 5.2 | 304.5 |
| 3d quarter | 440.7 | 36.7 | 404.0 | 38.1 | −.6 | .9 | 365.5 | 42.6 | 14.5 | .0 | 19.4 | 6.6 | 12.7 | 348.9 | 36.1 | 5.3 | 307.5 |
| 4th quarter | 443.8 | 37.2 | 406.5 | 38.5 | −.3 | .8 | 367.3 | 42.6 | 14.7 | .0 | 19.9 | 6.7 | 12.8 | 351.3 | 36.2 | 5.4 | 309.8 |
| 1958—1st quarter | 446.2 | 37.8 | 408.4 | 38.8 | −1.9 | 1.0 | 370.7 | 42.1 | 14.8 | .6 | 20.6 | 6.8 | 12.9 | 355.3 | 36.6 | 5.5 | 313.2 |
| 2d quarter | 453.1 | 38.3 | 414.7 | 39.3 | −1.0 | 1.2 | 375.8 | 43.0 | 15.2 | .6 | 21.1 | 7.0 | 13.0 | 359.9 | 37.2 | 5.6 | 317.1 |
| 3d quarter | 461.3 | 38.9 | 422.4 | 40.1 | −1.9 | 1.2 | 383.6 | 44.1 | 15.7 | −1.3 | 21.4 | 7.2 | 13.1 | 368.6 | 38.7 | 5.8 | 324.1 |
| 4th quarter | 469.5 | 39.4 | 430.1 | 41.0 | −1.4 | 1.2 | 389.9 | 45.1 | 16.1 | .0 | 21.6 | 7.4 | 13.3 | 372.7 | 39.1 | 5.9 | 327.7 |
| 1959—1st quarter | 472.2 | 40.0 | 432.2 | 41.6 | −.9 | .7 | 390.4 | 44.6 | 16.7 | .0 | 22.2 | 7.6 | 13.4 | 374.2 | 39.0 | 6.0 | 329.2 |
| 2d quarter | 475.5 | 40.6 | 434.9 | 42.0 | −.9 | .5 | 392.5 | 44.3 | 16.9 | .0 | 22.9 | 7.7 | 13.6 | 377.4 | 39.2 | 6.1 | 332.1 |
| 3d quarter | 481.5 | 41.2 | 440.3 | 42.5 | −2.8 | .3 | 399.2 | 44.6 | 17.2 | .0 | 23.4 | 8.0 | 13.7 | 384.2 | 40.3 | 6.2 | 337.7 |
| 4th quarter | 484.4 | 41.8 | 442.6 | 43.0 | −1.8 | .3 | 399.9 | 44.2 | 17.4 | .0 | 24.1 | 8.2 | 13.8 | 386.3 | 40.2 | 6.3 | 339.7 |
| 1960—1st quarter | 491.3 | 42.3 | 449.0 | 43.5 | −1.1 | .5 | 405.3 | 44.9 | 19.4 | .0 | 24.6 | 8.4 | 13.9 | 389.7 | 40.1 | 6.4 | 343.2 |
| 2d quarter | 498.6 | 42.9 | 455.7 | 44.3 | −2.9 | .6 | 413.1 | 45.6 | 19.8 | .0 | 25.1 | 8.7 | 14.0 | 397.2 | 41.5 | 6.6 | 349.2 |
| 3d quarter | 507.9 | 43.5 | 464.4 | 45.2 | −4.0 | .5 | 421.9 | 46.9 | 20.3 | .0 | 25.4 | 8.9 | 14.0 | 404.9 | 42.8 | 6.7 | 355.3 |
| 4th quarter | 513.3 | 44.1 | 469.2 | 46.0 | −2.9 | .5 | 424.9 | 46.8 | 20.6 | .0 | 25.9 | 9.2 | 14.1 | 408.4 | 43.2 | 6.8 | 358.4 |
| 1961—1st quarter | 520.4 | 44.7 | 475.7 | 46.7 | −2.6 | .6 | 430.4 | 47.8 | 21.0 | .0 | 26.4 | 9.5 | 14.3 | 413.6 | 43.9 | 6.9 | 362.7 |
| 2d quarter | 523.9 | 45.3 | 478.6 | 47.3 | −1.7 | .6 | 431.7 | 46.7 | 21.2 | .0 | 27.0 | 9.8 | 14.3 | 416.9 | 44.2 | 7.0 | 365.6 |
| 3d quarter | 529.1 | 45.9 | 483.2 | 47.7 | −1.7 | .6 | 435.9 | 46.8 | 21.5 | .0 | 27.7 | 10.1 | 14.4 | 421.7 | 44.9 | 7.2 | 369.6 |
| 4th quarter | 536.5 | 46.4 | 490.1 | 48.4 | −1.7 | .6 | 442.1 | 47.5 | 21.9 | .0 | 28.2 | 10.5 | 14.5 | 427.9 | 46.0 | 7.3 | 374.6 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 543.9 | 47.0 | 496.9 | 49.2 | −2.5 | .6 | 448.9 | 48.2 | 22.3 | .0 | 28.7 | 10.8 | 14.7 | 434.5 | 47.2 | 7.4 | 379.9 |
| 2d quarter | 552.4 | 47.5 | 504.8 | 50.1 | −2.5 | .6 | 455.9 | 49.2 | 22.8 | .0 | 29.2 | 11.2 | 14.8 | 441.1 | 48.3 | 7.5 | 385.2 |
| 3d quarter | 559.4 | 48.1 | 511.3 | 50.9 | −2.5 | .6 | 461.6 | 49.9 | 23.2 | .0 | 29.7 | 11.6 | 15.0 | 446.7 | 49.3 | 7.7 | 389.8 |
| 4th quarter | 565.7 | 48.7 | 516.9 | 51.7 | −2.5 | .6 | 466.5 | 50.1 | 23.6 | .0 | 30.3 | 12.1 | 15.1 | 452.1 | 50.1 | 7.8 | 394.2 |
| 1963—1st quarter | 571.5 | 49.3 | 522.2 | 52.3 | −1.7 | .6 | 470.2 | 50.3 | 23.9 | .0 | 30.9 | 12.5 | 15.2 | 456.6 | 50.8 | 7.9 | 397.9 |
| 2d quarter | 577.2 | 49.9 | 527.3 | 53.0 | −1.7 | .6 | 474.7 | 50.4 | 24.2 | .0 | 31.6 | 13.0 | 15.3 | 461.9 | 51.6 | 8.0 | 402.2 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–A–4.—*U.S. economy simulations—Orders fluctuation reduction policy: Gross national product demands*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1953—3d quarter [1] | 367.7 | 234.1 | 151.3 | 82.8 | 51.2 | 36.7 | 13.8 | 0.7 | −0.8 | 1.5 | −0.8 | 16.7 | 17.5 | 82.7 |
| 4th quarter | 364.2 | 232.2 | 148.5 | 83.7 | 49.3 | 37.2 | 14.6 | −2.5 | −.3 | −2.2 | −.8 | 16.7 | 17.5 | 83.5 |
| 1954—1st quarter | 359.5 | 234.0 | 149.6 | 84.4 | 47.5 | 36.6 | 14.7 | −3.8 | .2 | −4.0 | −1.4 | 16.0 | 17.4 | 79.4 |
| 2d quarter | 360.8 | 237.5 | 151.8 | 85.8 | 48.1 | 36.0 | 14.4 | −2.3 | .5 | −2.8 | .8 | 17.9 | 17.1 | 74.4 |
| 3d quarter | 367.0 | 242.1 | 154.5 | 87.7 | 50.5 | 35.7 | 15.2 | −.3 | .7 | −1.0 | .2 | 17.3 | 17.1 | 74.1 |
| 4th quarter | 374.2 | 245.9 | 156.5 | 89.4 | 53.8 | 35.9 | 16.0 | 1.9 | .6 | 1.3 | 1.4 | 18.7 | 17.3 | 73.0 |
| 1955—1st quarter | 381.9 | 250.0 | 158.6 | 91.4 | 56.2 | 36.7 | 16.8 | 2.7 | .6 | 2.1 | 1.1 | 18.7 | 17.6 | 74.6 |
| 2d quarter | 387.7 | 253.0 | 160.0 | 93.0 | 59.1 | 37.9 | 17.7 | 3.5 | .4 | 3.1 | .6 | 18.6 | 18.0 | 74.9 |
| 3d quarter | 397.0 | 257.8 | 162.2 | 95.6 | 61.7 | 39.1 | 18.1 | 4.5 | .2 | 4.3 | 1.7 | 20.0 | 18.3 | 75.8 |
| 4th quarter | 404.2 | 261.0 | 163.4 | 97.6 | 64.6 | 40.8 | 18.5 | 5.3 | .0 | 5.3 | 1.5 | 20.3 | 18.8 | 77.1 |
| 1956—1st quarter | 407.8 | 264.1 | 164.6 | 99.5 | 65.0 | 42.3 | 18.6 | 4.1 | −.3 | 4.4 | 2.2 | 21.4 | 19.2 | 76.6 |
| 2d quarter | 410.9 | 266.3 | 165.3 | 101.0 | 64.1 | 43.2 | 18.3 | 2.7 | −.7 | 3.4 | 3.1 | 22.6 | 19.5 | 77.3 |
| 3d quarter | 417.1 | 269.4 | 166.6 | 102.8 | 63.4 | 43.8 | 18.0 | 1.7 | −.5 | 2.2 | 4.5 | 24.1 | 19.6 | 79.8 |
| 4th quarter | 422.4 | 272.4 | 168.0 | 104.4 | 63.3 | 43.7 | 18.0 | 1.6 | −.1 | 1.7 | 4.7 | 24.5 | 19.8 | 82.0 |
| 1957—1st quarter | 432.8 | 275.1 | 169.3 | 105.8 | 65.5 | 44.1 | 18.0 | 3.3 | .3 | 3.0 | 6.9 | 27.0 | 20.1 | 85.3 |
| 2d quarter | 437.1 | 278.3 | 171.0 | 107.3 | 66.5 | 44.8 | 18.7 | 2.9 | .7 | 2.2 | 5.9 | 26.4 | 20.5 | 86.4 |
| 3d quarter | 441.0 | 282.2 | 173.1 | 109.1 | 66.1 | 45.3 | 19.0 | 1.9 | .9 | 1.0 | 5.8 | 26.6 | 20.8 | 86.9 |
| 4th quarter | 444.2 | 285.6 | 174.9 | 110.7 | 67.0 | 45.4 | 19.2 | 2.4 | 1.1 | 1.3 | 3.9 | 24.9 | 21.0 | 87.7 |
| 1958—1st quarter | 446.5 | 288.7 | 176.6 | 112.1 | 66.7 | 45.5 | 19.3 | 1.9 | 1.0 | .9 | 1.3 | 22.5 | 21.2 | 89.8 |
| 2d quarter | 453.5 | 292.9 | 178.9 | 114.0 | 67.2 | 45.3 | 19.3 | 2.7 | 1.0 | 1.7 | 1.4 | 22.7 | 21.3 | 92.0 |
| 3d quarter | 462.0 | 297.1 | 181.1 | 116.0 | 68.5 | 45.4 | 19.6 | 3.5 | .9 | 2.6 | 1.3 | 22.9 | 21.6 | 95.1 |
| 4th quarter | 470.5 | 303.0 | 184.1 | 118.9 | 70.0 | 45.9 | 20.0 | 4.1 | .7 | 3.4 | .7 | 22.7 | 22.0 | 96.7 |
| 1959—1st quarter | 473.0 | 305.8 | 185.3 | 120.5 | 70.7 | 46.9 | 20.4 | 3.5 | .2 | 3.3 | −.3 | 22.1 | 22.4 | 96.7 |
| 2d quarter | 476.0 | 307.7 | 186.2 | 121.6 | 71.1 | 47.4 | 20.5 | 3.2 | .1 | 3.1 | −.3 | 22.3 | 22.6 | 97.5 |
| 3d quarter | 482.0 | 311.1 | 187.8 | 123.3 | 71.6 | 47.8 | 20.5 | 3.3 | −.0 | 3.3 | 1.2 | 24.0 | 22.8 | 98.1 |
| 4th quarter | 484.6 | 316.1 | 190.4 | 125.7 | 71.5 | 48.0 | 20.7 | 2.8 | .1 | 2.7 | .4 | 23.5 | 23.1 | 96.5 |
| 1960—1st quarter | 492.0 | 319.7 | 192.2 | 127.5 | 73.1 | 48.1 | 21.2 | 3.7 | .1 | 3.6 | 2.4 | 25.6 | 23.2 | 96.9 |
| 2d quarter | 499.4 | 322.8 | 193.8 | 129.0 | 73.8 | 48.5 | 21.5 | 3.9 | .3 | 3.6 | 3.2 | 26.7 | 23.5 | 99.6 |
| 3d quarter | 509.3 | 328.5 | 196.7 | 131.8 | 76.0 | 49.0 | 21.8 | 5.1 | .4 | 4.7 | 2.9 | 26.8 | 23.9 | 101.9 |
| 4th quarter | 514.5 | 333.5 | 199.0 | 134.5 | 76.1 | 49.5 | 22.4 | 4.2 | .3 | 3.9 | 3.3 | 27.6 | 24.3 | 101.6 |
| 1961—1st quarter | 522.6 | 335.9 | 199.9 | 136.0 | 78.7 | 50.1 | 22.4 | 6.2 | .3 | 5.9 | 3.0 | 27.6 | 24.6 | 105.0 |
| 2d quarter | 524.4 | 339.6 | 201.6 | 138.0 | 76.3 | 50.8 | 22.6 | 2.9 | .4 | 2.5 | 1.4 | 26.4 | 25.0 | 107.2 |
| 3d quarter | 529.2 | 342.3 | 202.8 | 139.5 | 76.1 | 50.9 | 22.3 | 2.8 | .4 | 2.4 | 1.8 | 27.0 | 25.2 | 109.0 |
| 4th quarter | 536.6 | 346.1 | 204.7 | 141.4 | 76.5 | 51.1 | 22.1 | 3.3 | .4 | 2.9 | 1.9 | 27.3 | 25.4 | 112.1 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 544.4 | 350.6 | 206.9 | 143.7 | 78.1 | 51.6 | 22.3 | 4.2 | .2 | 4.0 | 1.0 | 26.7 | 25.7 | 114.7 |
| 2d quarter | 553.3 | 355.2 | 209.2 | 146.1 | 79.9 | 52.2 | 22.6 | 5.1 | .2 | 4.9 | 1.0 | 27.0 | 26.0 | 117.2 |
| 3d quarter | 560.9 | 359.7 | 211.3 | 148.4 | 82.0 | 53.1 | 23.0 | 5.9 | .2 | 5.7 | 1.0 | 27.5 | 26.5 | 118.2 |
| 4th quarter | 567.3 | 363.5 | 213.1 | 150.4 | 83.2 | 53.7 | 23.5 | 6.0 | .2 | 5.8 | 1.0 | 27.9 | 26.9 | 119.6 |
| 1963—1st quarter | 573.2 | 367.3 | 214.9 | 152.4 | 83.9 | 54.1 | 23.7 | 6.1 | .2 | 5.9 | 1.0 | 28.3 | 27.3 | 121.0 |
| 2d quarter | 578.9 | 370.8 | 216.6 | 154.2 | 84.7 | 54.7 | 23.9 | 6.2 | .2 | 6.0 | 1.0 | 28.6 | 27.6 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–B–4.—*U.S. economy simulations—Orders fluctuation reduction policy: Relation of GNP and disposable income*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1953—3d quarter[2] | 367.1 | 26.8 | 340.3 | 30.4 | 0.8 | −0.5 | 307.2 | 37.5 | 8.7 | −0.1 | 12.8 | 5.2 | 9.4 | 289.9 | 32.5 | 3.5 | 253.9 |
| 4th quarter | 364.2 | 27.4 | 336.8 | 30.2 | 1.2 | −.5 | 303.4 | 34.8 | 9.3 | −.1 | 13.5 | 5.2 | 9.5 | 289.1 | 32.2 | 3.6 | 253.4 |
| 1954—1st quarter | 359.5 | 28.0 | 331.5 | 30.0 | 1.0 | −.4 | 298.8 | 32.5 | 9.0 | .0 | 14.7 | 5.2 | 9.6 | 288.1 | 29.8 | 3.6 | 254.7 |
| 2d quarter | 360.8 | 28.5 | 332.3 | 30.1 | −.8 | −.3 | 301.4 | 32.9 | 9.1 | .0 | 15.5 | 5.2 | 9.7 | 291.2 | 29.9 | 3.8 | 257.5 |
| 3d quarter | 367.0 | 29.0 | 337.9 | 30.4 | .8 | −.2 | 305.4 | 34.7 | 9.4 | .0 | 16.0 | 5.2 | 9.9 | 293.5 | 29.9 | 3.9 | 259.8 |
| 4th quarter | 374.2 | 29.6 | 344.6 | 30.7 | 1.7 | .0 | 311.0 | 36.8 | 9.8 | .0 | 16.2 | 5.3 | 10.1 | 297.2 | 30.1 | 4.0 | 263.1 |
| 1955—1st quarter | 381.9 | 30.2 | 351.7 | 31.4 | 3.7 | −.1 | 315.2 | 38.3 | 10.2 | .1 | 16.4 | 5.4 | 10.3 | 300.0 | 30.2 | 4.1 | 265.7 |
| 2d quarter | 387.7 | 30.8 | 356.9 | 32.2 | −.2 | .0 | 323.5 | 39.3 | 10.6 | .5 | 16.6 | 5.5 | 10.6 | 307.2 | 31.3 | 4.2 | 271.7 |
| 3d quarter | 397.0 | 31.5 | 365.5 | 33.0 | 1.2 | .1 | 329.9 | 41.1 | 11.1 | −.6 | 16.6 | 5.6 | 10.9 | 313.0 | 32.1 | 4.3 | 276.5 |
| 4th quarter | 404.2 | 32.2 | 372.0 | 33.9 | −.9 | .2 | 337.7 | 42.3 | 11.5 | .0 | 16.8 | 5.7 | 11.2 | 319.1 | 32.9 | 4.5 | 281.7 |
| 1956—1st quarter | 407.8 | 33.0 | 374.9 | 34.5 | −1.3 | .8 | 341.0 | 41.7 | 11.7 | .0 | 17.1 | 5.8 | 11.5 | 323.5 | 33.4 | 4.6 | 285.5 |
| 2d quarter | 410.9 | 33.7 | 377.2 | 34.9 | −3.3 | .9 | 344.9 | 40.8 | 11.9 | .0 | 17.6 | 5.9 | 11.8 | 329.1 | 34.2 | 4.7 | 290.2 |
| 3d quarter | 417.1 | 34.3 | 382.8 | 35.4 | −2.8 | 1.0 | 349.6 | 40.9 | 12.2 | .0 | 18.0 | 6.0 | 12.0 | 334.1 | 34.8 | 4.8 | 294.4 |
| 4th quarter | 422.4 | 34.9 | 387.4 | 36.0 | −2.2 | 1.1 | 353.0 | 41.2 | 12.5 | .0 | 18.4 | 6.1 | 12.2 | 337.7 | 35.1 | 4.9 | 297.6 |
| 1957—1st quarter | 432.8 | 35.5 | 397.3 | 36.8 | −.2 | 1.2 | 360.0 | 43.5 | 14.1 | .0 | 18.5 | 6.3 | 12.5 | 341.5 | 35.5 | 5.0 | 301.0 |
| 2d quarter | 437.1 | 36.1 | 401.0 | 37.7 | −1.1 | 1.1 | 363.7 | 43.3 | 14.3 | .0 | 18.8 | 6.4 | 12.7 | 345.8 | 35.9 | 5.2 | 304.7 |
| 3d quarter | 441.0 | 36.7 | 404.4 | 38.1 | −.6 | .9 | 365.8 | 42.7 | 14.5 | .0 | 19.3 | 6.5 | 12.8 | 349.1 | 36.2 | 5.3 | 307.7 |
| 4th quarter | 444.2 | 37.3 | 407.0 | 38.5 | −.3 | .8 | 367.7 | 42.7 | 14.7 | .0 | 19.9 | 6.7 | 12.9 | 351.6 | 36.2 | 5.4 | 310.0 |
| 1958—1st quarter | 446.5 | 37.8 | 408.7 | 38.8 | −1.9 | 1.0 | 370.9 | 42.1 | 14.8 | .6 | 20.6 | 6.8 | 13.0 | 355.6 | 36.7 | 5.5 | 313.4 |
| 2d quarter | 453.5 | 38.4 | 415.2 | 39.3 | −1.0 | 1.2 | 376.2 | 43.1 | 15.2 | .6 | 21.1 | 7.0 | 13.1 | 360.2 | 37.3 | 5.6 | 317.3 |
| 3d quarter | 462.0 | 38.9 | 423.1 | 40.2 | −1.9 | 1.2 | 384.2 | 44.5 | 15.7 | −1.3 | 21.4 | 7.1 | 13.2 | 368.9 | 38.8 | 5.8 | 324.3 |
| 4th quarter | 470.5 | 39.4 | 431.0 | 41.1 | −1.4 | 1.2 | 390.7 | 45.6 | 16.2 | .0 | 21.6 | 7.3 | 13.4 | 373.1 | 39.2 | 5.9 | 328.0 |
| 1959—1st quarter | 473.0 | 40.0 | 433.0 | 41.7 | −.9 | .7 | 391.0 | 44.9 | 16.7 | .0 | 22.2 | 7.5 | 13.6 | 374.5 | 39.0 | 6.0 | 329.5 |
| 2d quarter | 476.0 | 40.6 | 435.4 | 42.0 | −.9 | .5 | 393.0 | 44.4 | 16.9 | .0 | 22.9 | 7.7 | 13.7 | 377.7 | 39.3 | 6.1 | 332.4 |
| 3d quarter | 482.0 | 41.2 | 440.8 | 42.5 | −2.8 | .3 | 399.6 | 44.8 | 17.2 | .0 | 23.4 | 7.9 | 13.8 | 384.5 | 40.4 | 6.2 | 337.9 |
| 4th quarter | 484.6 | 41.8 | 442.8 | 43.0 | −1.8 | .3 | 400.1 | 44.1 | 17.4 | .0 | 24.2 | 8.1 | 13.9 | 386.5 | 40.3 | 6.3 | 339.9 |
| 1960—1st quarter | 492.0 | 42.4 | 449.6 | 43.5 | −1.1 | .5 | 405.9 | 45.2 | 19.4 | .0 | 24.6 | 8.3 | 14.0 | 390.0 | 40.2 | 6.4 | 343.4 |
| 2d quarter | 499.4 | 42.9 | 456.5 | 44.3 | −2.9 | .6 | 413.8 | 45.9 | 19.8 | .0 | 25.1 | 8.6 | 14.1 | 397.6 | 41.6 | 6.6 | 349.5 |
| 3d quarter | 509.3 | 43.5 | 465.8 | 45.3 | −4.0 | .5 | 423.2 | 47.7 | 20.4 | .0 | 25.4 | 8.9 | 14.2 | 405.3 | 42.9 | 6.7 | 355.7 |
| 4th quarter | 514.5 | 44.1 | 470.4 | 46.1 | −2.9 | .5 | 425.9 | 47.3 | 20.7 | .0 | 25.9 | 9.1 | 14.3 | 408.9 | 43.3 | 6.8 | 358.8 |
| 1961—1st quarter | 522.6 | 44.7 | 477.9 | 46.8 | −2.6 | .6 | 432.3 | 49.0 | 21.1 | .0 | 26.3 | 9.4 | 14.4 | 414.2 | 44.1 | 6.9 | 363.2 |
| 2d quarter | 524.4 | 45.3 | 479.1 | 47.4 | −1.7 | .6 | 432.1 | 46.7 | 21.3 | .0 | 27.0 | 9.7 | 14.5 | 417.3 | 44.4 | 7.0 | 365.9 |
| 3d quarter | 529.2 | 45.9 | 483.3 | 47.8 | −1.7 | .6 | 435.9 | 46.6 | 21.5 | .0 | 27.8 | 10.0 | 14.5 | 422.1 | 45.0 | 7.2 | 369.9 |
| 4th quarter | 536.6 | 46.4 | 490.2 | 48.4 | −1.7 | .6 | 442.1 | 47.3 | 21.9 | .0 | 28.3 | 10.4 | 14.6 | 428.1 | 46.0 | 7.3 | 374.8 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 544.4 | 47.0 | 497.4 | 49.2 | −2.5 | .6 | 449.4 | 48.4 | 22.4 | .0 | 28.8 | 10.7 | 14.8 | 434.8 | 47.2 | 7.4 | 380.1 |
| 2d quarter | 533.3 | 47.5 | 505.8 | 50.2 | −2.5 | .6 | 456.8 | 49.7 | 22.9 | .0 | 29.2 | 11.1 | 14.9 | 441.5 | 48.4 | 7.6 | 385.5 |
| 3d quarter | 560.9 | 48.1 | 512.7 | 51.1 | −2.5 | .6 | 462.8 | 50.6 | 23.3 | .0 | 29.7 | 11.5 | 15.1 | 447.2 | 49.4 | 7.7 | 390.2 |
| 4th quarter | 567.3 | 48.7 | 518.6 | 51.8 | −2.5 | .6 | 467.9 | 50.9 | 23.7 | .0 | 30.3 | 12.0 | 15.2 | 452.7 | 50.3 | 7.8 | 394.6 |
| 1963—1st quarter | 573.2 | 49.4 | 523.8 | 52.5 | −1.7 | .6 | 471.7 | 51.0 | 24.0 | .0 | 30.9 | 12.4 | 15.4 | 457.3 | 51.0 | 7.9 | 398.4 |
| 2d quarter | 578.9 | 50.0 | 528.9 | 53.2 | −1.7 | .6 | 476.2 | 51.1 | 24.3 | .0 | 31.6 | 12.8 | 15.5 | 462.6 | 51.8 | 8.0 | 402.7 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–A–5.—*U.S. economy simulations—Inventory and orders fluctuation reduction policy: Gross national product demands*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1953—3d quarter [1] | 367.1 | 234.1 | 151.3 | 82.8 | 51.2 | 36.7 | 13.8 | 0.7 | −0.8 | 1.5 | −0.8 | 16.7 | 17.5 | 82.7 |
| 4th quarter | 365.3 | 232.2 | 148.5 | 83.7 | 50.4 | 37.2 | 14.6 | −1.4 | −.3 | −1.1 | −.8 | 16.7 | 17.5 | 83.5 |
| 1954—1st quarter | 361.7 | 234.1 | 149.7 | 84.4 | 49.7 | 36.8 | 14.8 | −1.9 | .2 | −2.1 | −1.4 | 16.0 | 17.4 | 79.4 |
| 2d quarter | 362.6 | 237.7 | 151.9 | 85.8 | 49.9 | 36.5 | 14.5 | −1.1 | .5 | −1.6 | .6 | 17.9 | 17.3 | 74.4 |
| 3d quarter | 367.8 | 242.3 | 154.6 | 87.8 | 51.4 | 36.2 | 15.3 | −.1 | .7 | −.8 | .0 | 17.3 | 17.3 | 74.1 |
| 4th quarter | 373.6 | 246.0 | 156.6 | 89.4 | 53.3 | 36.4 | 16.0 | .9 | .6 | .3 | 1.3 | 18.7 | 17.4 | 73.0 |
| 1955—1st quarter | 380.5 | 249.9 | 158.6 | 91.3 | 54.9 | 36.9 | 16.7 | 1.4 | .6 | .8 | 1.1 | 18.7 | 17.6 | 74.6 |
| 2d quarter | 385.6 | 252.9 | 159.9 | 93.0 | 57.1 | 37.8 | 17.5 | 1.8 | .4 | 1.4 | .7 | 18.6 | 17.9 | 74.9 |
| 3d quarter | 394.2 | 257.7 | 162.2 | 95.5 | 58.9 | 38.8 | 17.8 | 2.3 | .2 | 2.1 | 1.8 | 20.0 | 18.2 | 75.8 |
| 4th quarter | 400.8 | 260.9 | 163.4 | 97.5 | 61.1 | 40.2 | 18.2 | 2.8 | .0 | 2.8 | 1.8 | 20.3 | 18.5 | 77.1 |
| 1956—1st quarter | 405.1 | 264.0 | 164.6 | 99.4 | 62.0 | 41.5 | 18.3 | 2.2 | −.3 | 2.5 | 2.5 | 21.4 | 18.9 | 76.6 |
| 2d quarter | 409.1 | 266.3 | 165.4 | 100.9 | 62.0 | 42.4 | 18.2 | 1.5 | −.7 | 2.2 | 3.4 | 22.6 | 19.2 | 77.3 |
| 3d quarter | 416.4 | 269.5 | 166.8 | 102.8 | 62.4 | 43.1 | 18.0 | 1.3 | −.5 | 1.8 | 4.7 | 24.1 | 19.4 | 79.8 |
| 4th quarter | 422.3 | 272.6 | 168.1 | 104.5 | 63.0 | 43.2 | 18.2 | 1.5 | −.1 | 1.6 | 4.8 | 24.5 | 19.7 | 82.0 |
| 1957—1st quarter | 432.4 | 275.2 | 169.3 | 105.9 | 64.9 | 43.9 | 18.3 | 2.6 | .3 | 2.3 | 7.0 | 27.0 | 20.0 | 85.3 |
| 2d quarter | 437.1 | 278.4 | 171.0 | 107.4 | 66.3 | 44.7 | 18.9 | 2.6 | .7 | 1.9 | 6.0 | 26.4 | 20.4 | 86.4 |
| 3d quarter | 441.5 | 282.1 | 173.0 | 109.1 | 66.6 | 45.2 | 19.2 | 2.2 | .9 | 1.3 | 5.9 | 26.6 | 20.7 | 86.9 |
| 4th quarter | 444.6 | 285.5 | 174.8 | 110.7 | 67.4 | 45.5 | 19.4 | 2.6 | 1.1 | 1.5 | 3.9 | 24.9 | 21.0 | 87.7 |
| 1958—1st quarter | 446.9 | 288.5 | 176.5 | 112.1 | 67.2 | 45.7 | 19.3 | 2.3 | 1.0 | 1.3 | 1.3 | 22.5 | 21.2 | 89.8 |
| 2d quarter | 453.4 | 292.7 | 178.8 | 114.0 | 67.4 | 45.5 | 19.2 | 2.6 | 1.0 | 1.6 | 1.3 | 22.7 | 21.4 | 92.0 |
| 3d quarter | 461.4 | 297.0 | 181.0 | 116.0 | 68.0 | 45.5 | 19.5 | 3.0 | .9 | 2.1 | 1.3 | 22.9 | 21.6 | 95.1 |
| 4th quarter | 469.4 | 302.8 | 184.0 | 118.8 | 69.1 | 46.0 | 19.9 | 3.2 | .7 | 2.5 | .8 | 22.7 | 21.9 | 96.7 |
| 1959—1st quarter | 471.9 | 305.6 | 185.2 | 120.4 | 69.8 | 46.8 | 20.3 | 2.7 | .2 | 2.5 | −.2 | 22.1 | 22.3 | 96.7 |
| 2d quarter | 475.2 | 307.6 | 186.1 | 121.6 | 70.3 | 47.3 | 20.4 | 2.6 | .1 | 2.5 | −.2 | 22.3 | 22.5 | 97.5 |
| 3d quarter | 481.2 | 311.0 | 187.8 | 123.2 | 70.8 | 47.7 | 20.5 | 2.7 | .0 | 2.7 | 1.3 | 24.0 | 22.7 | 98.1 |
| 4th quarter | 484.1 | 316.0 | 190.3 | 125.7 | 71.1 | 47.9 | 20.7 | 2.5 | .1 | 2.4 | .5 | 23.5 | 23.0 | 96.5 |
| 1960—1st quarter | 491.2 | 319.6 | 192.1 | 127.5 | 72.3 | 48.0 | 21.3 | 3.0 | .1 | 2.9 | 2.4 | 25.6 | 23.2 | 96.9 |
| 2d quarter | 498.7 | 322.7 | 193.7 | 129.0 | 73.2 | 48.4 | 21.5 | 3.2 | .3 | 2.9 | 3.3 | 26.7 | 23.4 | 99.6 |
| 3d quarter | 508.0 | 328.4 | 196.6 | 131.8 | 74.7 | 48.9 | 21.9 | 3.9 | .4 | 3.5 | 3.0 | 26.8 | 23.8 | 101.9 |
| 4th quarter | 513.6 | 333.3 | 198.9 | 134.4 | 75.3 | 49.3 | 22.4 | 3.6 | .3 | 3.3 | 3.4 | 27.6 | 24.2 | 101.6 |
| 1961—1st quarter | 520.7 | 335.7 | 199.8 | 135.9 | 76.9 | 49.9 | 22.4 | 4.6 | .3 | 4.3 | 3.1 | 27.6 | 24.5 | 105.0 |
| 2d quarter | 524.1 | 339.3 | 201.4 | 137.9 | 76.1 | 50.5 | 22.5 | 3.1 | .4 | 2.7 | 1.5 | 26.4 | 24.9 | 107.2 |
| 3d quarter | 529.3 | 342.1 | 202.7 | 139.4 | 76.3 | 50.8 | 22.3 | 3.1 | .4 | 2.7 | 1.9 | 27.0 | 25.1 | 109.0 |
| 4th quarter | 536.7 | 346.0 | 204.6 | 141.4 | 76.7 | 51.1 | 22.2 | 3.3 | .4 | 2.9 | 1.9 | 27.3 | 25.4 | 112.1 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 544.0 | 350.4 | 206.8 | 143.7 | 77.8 | 51.7 | 22.4 | 3.7 | .2 | 3.5 | 1.0 | 26.7 | 25.7 | 114.7 |
| 2d quarter | 552.4 | 355.0 | 209.0 | 146.0 | 79.1 | 52.3 | 22.6 | 4.2 | .2 | 4.0 | 1.0 | 27.0 | 26.0 | 117.2 |
| 3d quarter | 559.4 | 359.4 | 211.1 | 148.3 | 80.8 | 53.0 | 23.1 | 4.7 | .2 | 4.5 | 1.0 | 27.4 | 26.4 | 118.2 |
| 4th quarter | 565.6 | 363.2 | 212.9 | 150.3 | 81.8 | 53.6 | 23.4 | 4.8 | .2 | 4.6 | 1.0 | 27.8 | 26.8 | 119.6 |
| 1963—1st quarter | 571.4 | 367.0 | 214.7 | 152.3 | 82.5 | 53.8 | 23.7 | 5.0 | .2 | 4.8 | 1.0 | 28.1 | 27.1 | 121.0 |
| 2d quarter | 577.1 | 370.5 | 216.4 | 154.1 | 83.3 | 54.4 | 23.8 | 5.1 | .2 | 4.9 | 1.0 | 28.5 | 27.5 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–B–5.—*U.S. economy simulations—Inventory and orders fluctuation reduction policy: Relation of GNP and disposable income*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1953—3d quarter[2] | 367.1 | 26.8 | 340.3 | 30.4 | 0.8 | −0.5 | 307.2 | 37.5 | 8.7 | −0.1 | 12.8 | 5.2 | 9.4 | 289.9 | 32.5 | 3.5 | 253.9 |
| 4th quarter | 365.3 | 27.4 | 337.9 | 30.3 | 1.2 | −.5 | 304.5 | 35.6 | 9.3 | −.1 | 13.4 | 5.2 | 9.5 | 289.3 | 32.2 | 3.6 | 253.5 |
| 1954—1st quarter | 361.7 | 28.0 | 333.7 | 30.1 | 1.0 | −.4 | 300.9 | 33.9 | 9.1 | .0 | 14.5 | 5.2 | 9.7 | 288.6 | 29.9 | 3.6 | 255.0 |
| 2d quarter | 362.6 | 28.6 | 334.1 | 30.2 | −.8 | −.3 | 303.1 | 33.9 | 9.2 | .0 | 15.4 | 5.2 | 9.8 | 291.8 | 30.1 | 3.8 | 257.9 |
| 3d quarter | 367.8 | 29.1 | 338.7 | 30.4 | .8 | −.2 | 306.1 | 34.9 | 9.5 | .0 | 15.9 | 5.3 | 10.0 | 294.0 | 30.0 | 3.9 | 260.2 |
| 4th quarter | 373.6 | 29.6 | 344.0 | 30.7 | 1.7 | .0 | 310.4 | 36.1 | 9.8 | .0 | 16.2 | 5.4 | 10.1 | 297.4 | 30.2 | 4.0 | 263.2 |
| 1955—1st quarter | 380.5 | 30.2 | 350.3 | 31.3 | 3.7 | −.1 | 313.9 | 37.2 | 10.2 | .1 | 16.5 | 5.4 | 10.3 | 299.9 | 30.2 | 4.1 | 265.6 |
| 2d quarter | 385.6 | 30.8 | 354.7 | 32.0 | −.2 | .0 | 321.5 | 37.9 | 10.5 | .5 | 16.8 | 5.5 | 10.5 | 306.9 | 31.2 | 4.2 | 271.5 |
| 3d quarter | 394.2 | 31.5 | 362.7 | 32.7 | 1.2 | .1 | 327.4 | 39.3 | 10.9 | −.6 | 16.9 | 5.6 | 10.8 | 312.5 | 32.0 | 4.3 | 276.2 |
| 4th quarter | 400.8 | 32.2 | 368.7 | 33.6 | −.9 | .2 | 334.7 | 40.3 | 11.3 | .0 | 17.0 | 5.7 | 11.1 | 318.4 | 32.8 | 4.5 | 281.2 |
| 1956—1st quarter | 405.1 | 32.9 | 372.3 | 34.2 | −1.3 | .8 | 338.7 | 40.2 | 11.5 | .0 | 17.4 | 5.8 | 11.4 | 323.0 | 33.3 | 4.6 | 285.1 |
| 2d quarter | 409.1 | 33.5 | 375.6 | 34.6 | −3.3 | .9 | 343.5 | 40.0 | 11.8 | .0 | 17.8 | 5.9 | 11.6 | 328.7 | 34.1 | 4.7 | 289.9 |
| 3d quarter | 416.4 | 34.2 | 382.2 | 35.2 | −2.8 | 1.0 | 349.2 | 40.6 | 12.2 | .0 | 18.1 | 6.1 | 11.8 | 333.9 | 34.8 | 4.8 | 294.3 |
| 4th quarter | 422.3 | 34.8 | 387.5 | 36.0 | −2.2 | 1.1 | 353.1 | 41.3 | 12.5 | .0 | 18.4 | 6.2 | 12.0 | 337.7 | 35.1 | 4.9 | 297.6 |
| 1957—1st quarter | 432.4 | 35.4 | 397.0 | 36.8 | −.2 | 1.2 | 359.7 | 43.1 | 14.1 | .0 | 18.5 | 6.3 | 12.3 | 341.5 | 35.4 | 5.0 | 301.0 |
| 2d quarter | 437.1 | 36.1 | 401.0 | 37.7 | −1.1 | 1.1 | 363.7 | 43.3 | 14.3 | .0 | 18.8 | 6.5 | 12.5 | 345.7 | 35.9 | 5.2 | 304.7 |
| 3d quarter | 441.5 | 36.7 | 404.8 | 38.2 | −.6 | .9 | 366.3 | 43.1 | 14.6 | .0 | 19.3 | 6.6 | 12.7 | 349.1 | 36.2 | 5.3 | 307.6 |
| 4th quarter | 444.6 | 37.3 | 407.3 | 38.6 | −.3 | .8 | 368.0 | 43.0 | 14.7 | .0 | 19.9 | 6.7 | 12.8 | 351.5 | 36.2 | 5.4 | 309.9 |
| 1958—1st quarter | 446.9 | 37.8 | 409.0 | 38.9 | −1.9 | 1.0 | 371.2 | 42.4 | 14.9 | .6 | 20.5 | 6.9 | 12.9 | 355.5 | 36.7 | 5.5 | 313.3 |
| 2d quarter | 453.4 | 38.4 | 415.1 | 39.3 | −1.0 | 1.2 | 376.1 | 43.2 | 15.2 | .6 | 21.0 | 7.0 | 13.0 | 360.0 | 37.2 | 5.6 | 317.2 |
| 3d quarter | 461.4 | 38.9 | 422.4 | 40.1 | −1.9 | 1.2 | 383.6 | 44.1 | 15.7 | −1.3 | 21.4 | 7.2 | 13.2 | 368.6 | 38.7 | 5.8 | 324.1 |
| 4th quarter | 469.4 | 39.5 | 429.9 | 41.0 | −1.4 | 1.2 | 389.7 | 45.0 | 16.1 | .0 | 21.6 | 7.4 | 13.3 | 372.7 | 39.1 | 5.9 | 327.7 |
| 1959—1st quarter | 471.9 | 40.0 | 431.9 | 41.6 | −.9 | .7 | 390.1 | 44.4 | 16.7 | .0 | 22.3 | 7.6 | 13.5 | 374.1 | 39.0 | 6.0 | 329.2 |
| 2d quarter | 475.2 | 40.6 | 434.6 | 41.9 | −.9 | .5 | 392.2 | 44.0 | 16.8 | .0 | 22.9 | 7.8 | 13.6 | 377.4 | 39.2 | 6.1 | 332.1 |
| 3d quarter | 481.2 | 41.2 | 440.0 | 42.4 | −2.8 | .3 | 398.9 | 44.4 | 17.2 | .0 | 23.5 | 8.0 | 13.7 | 384.2 | 40.3 | 6.2 | 337.7 |
| 4th quarter | 484.1 | 41.7 | 442.4 | 42.9 | −1.8 | .3 | 399.8 | 44.0 | 17.4 | .0 | 24.2 | 8.2 | 13.8 | 386.3 | 40.3 | 6.3 | 339.7 |
| 1960—1st quarter | 491.2 | 42.3 | 448.9 | 43.5 | −1.1 | .5 | 405.2 | 44.8 | 19.4 | .0 | 24.7 | 8.4 | 13.8 | 389.8 | 40.1 | 6.4 | 343.2 |
| 2d quarter | 498.7 | 42.9 | 455.8 | 44.3 | −2.9 | .6 | 413.2 | 45.6 | 19.8 | .0 | 25.1 | 8.7 | 13.9 | 397.3 | 41.5 | 6.6 | 349.3 |
| 3d quarter | 508.0 | 43.5 | 464.5 | 45.2 | −4.0 | .5 | 422.1 | 47.0 | 20.3 | .0 | 25.4 | 9.0 | 14.0 | 405.0 | 42.9 | 6.7 | 355.4 |
| 4th quarter | 513.6 | 44.1 | 469.5 | 46.0 | −2.9 | .5 | 425.1 | 46.9 | 20.6 | .0 | 25.9 | 9.3 | 14.1 | 408.6 | 43.2 | 6.8 | 358.5 |
| 1961—1st quarter | 520.7 | 44.7 | 476.0 | 46.7 | −2.6 | .6 | 430.6 | 47.9 | 21.0 | .0 | 26.3 | 9.6 | 14.3 | 413.7 | 44.0 | 6.9 | 362.8 |
| 2d quarter | 524.1 | 45.3 | 478.8 | 47.3 | −1.7 | .6 | 432.0 | 46.9 | 21.2 | .0 | 27.0 | 9.9 | 14.3 | 417.0 | 44.3 | 7.0 | 365.7 |
| 3d quarter | 529.3 | 45.9 | 483.4 | 47.7 | −1.7 | .6 | 436.1 | 46.9 | 21.5 | .0 | 27.7 | 10.2 | 14.4 | 421.8 | 45.0 | 7.2 | 369.7 |
| 4th quarter | 536.7 | 46.4 | 490.3 | 48.4 | −1.7 | .6 | 442.3 | 47.5 | 21.9 | .0 | 28.2 | 10.5 | 14.6 | 428.0 | 46.0 | 7.3 | 374.7 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 544.0 | 47.0 | 497.0 | 49.2 | −2.5 | .6 | 449.0 | 48.2 | 22.3 | .0 | 28.7 | 10.9 | 14.7 | 434.6 | 47.2 | 7.4 | 380.0 |
| 2d quarter | 552.4 | 47.5 | 504.8 | 50.1 | −2.5 | .6 | 456.0 | 49.2 | 22.8 | .0 | 29.2 | 11.3 | 14.8 | 441.2 | 48.4 | 7.6 | 385.3 |
| 3d quarter | 559.4 | 48.1 | 511.3 | 50.9 | −2.5 | .6 | 461.5 | 49.8 | 23.2 | .0 | 29.7 | 11.7 | 15.0 | 446.8 | 49.3 | 7.7 | 389.8 |
| 4th quarter | 565.6 | 48.7 | 516.9 | 51.7 | −2.5 | .6 | 466.4 | 50.0 | 23.6 | .0 | 30.3 | 12.1 | 15.1 | 452.2 | 50.2 | 7.8 | 394.2 |
| 1963—1st quarter | 571.4 | 49.3 | 522.1 | 52.3 | −1.7 | .6 | 470.1 | 50.2 | 23.9 | .0 | 31.0 | 12.6 | 15.2 | 456.7 | 50.8 | 7.9 | 398.0 |
| 2d quarter | 577.1 | 49.9 | 527.2 | 53.0 | −1.7 | .6 | 474.6 | 50.4 | 24.2 | .0 | 31.6 | 13.0 | 15.3 | 462.0 | 51.7 | 8.0 | 402.3 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–A–6.—*U.S. economy simulations—Alteration in Government expenditures policy: Gross national product demands*

RECESSION OF 1953-54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1953—3d quarter [1] | 367.1 | 234.1 | 151.3 | 82.8 | 51.2 | 36.7 | 13.8 | 0.7 | −0.8 | 1.5 | −0.8 | 16.7 | 17.5 | 82.7 |
| 4th quarter | 363.9 | 232.2 | 148.5 | 83.7 | 48.8 | 37.2 | 14.6 | −3.0 | −.3 | −2.7 | −.8 | 16.7 | 17.5 | 83.7 |
| 1954—1st quarter | 365.0 | 234.0 | 149.6 | 84.4 | 47.7 | 36.6 | 14.7 | −3.5 | .2 | −3.7 | −1.4 | 16.0 | 17.4 | 84.7 |
| 2d quarter | 377.1 | 239.1 | 152.7 | 86.4 | 51.6 | 36.3 | 14.8 | .5 | .5 | .0 | .6 | 17.9 | 17.3 | 85.8 |
| 3d quarter | 388.8 | 245.7 | 156.4 | 89.2 | 56.6 | 37.0 | 16.4 | 3.1 | .7 | 2.4 | −.3 | 17.3 | 17.6 | 86.8 |
| 4th quarter | 399.6 | 249.4 | 158.4 | 91.1 | 61.8 | 38.5 | 17.6 | 5.7 | .6 | 5.1 | .6 | 18.7 | 18.1 | 87.8 |
| 1955—1st quarter | 407.4 | 253.0 | 160.2 | 92.9 | 65.6 | 40.3 | 18.6 | 6.7 | .6 | 6.1 | .0 | 18.7 | 18.7 | 88.8 |
| 2d quarter | 412.7 | 255.3 | 161.2 | 94.1 | 68.3 | 42.1 | 19.2 | 7.0 | .4 | 6.6 | −.7 | 18.6 | 19.3 | 89.8 |
| 3d quarter | 421.5 | 260.0 | 163.7 | 96.4 | 70.4 | 43.4 | 19.0 | 8.0 | .2 | 7.8 | .3 | 20.0 | 19.7 | 90.8 |
| 4th quarter | 426.6 | 263.6 | 165.4 | 98.2 | 71.0 | 44.7 | 18.9 | 7.4 | .0 | 7.4 | .1 | 20.3 | 20.2 | 91.9 |
| 1956—1st quarter | 431.8 | 267.3 | 167.3 | 100.0 | 70.8 | 45.7 | 18.4 | 6.7 | −.3 | 7.0 | .8 | 21.4 | 20.6 | 92.9 |
| 2d quarter | 436.2 | 271.2 | 169.3 | 101.8 | 69.4 | 46.3 | 18.0 | 5.1 | −.7 | 5.8 | 1.8 | 22.6 | 20.8 | 93.9 |
| 3d quarter | 442.2 | 275.6 | 171.7 | 103.9 | 68.6 | 46.7 | 17.8 | 4.2 | −.5 | 4.7 | 3.1 | 24.1 | 21.0 | 94.9 |
| 4th quarter | 445.9 | 279.1 | 173.6 | 105.5 | 67.6 | 46.4 | 17.8 | 3.3 | −.1 | 3.4 | 3.2 | 24.5 | 21.3 | 95.9 |
| 1957—1st quarter | 452.7 | 282.3 | 175.4 | 106.9 | 67.8 | 46.6 | 18.0 | 3.2 | .3 | 2.9 | 5.6 | 27.0 | 21.4 | 97.0 |
| 2d quarter | 456.6 | 285.7 | 177.4 | 108.3 | 68.1 | 46.7 | 18.5 | 2.9 | .7 | 2.2 | 4.8 | 26.4 | 21.6 | 98.0 |
| 3d quarter | 461.9 | 290.3 | 180.1 | 110.2 | 67.8 | 46.6 | 18.9 | 2.3 | .9 | 1.4 | 4.7 | 26.6 | 21.9 | 99.0 |
| 4th quarter | 466.2 | 294.7 | 182.7 | 112.1 | 68.6 | 46.6 | 19.2 | 2.8 | 1.1 | 1.7 | 2.8 | 24.9 | 22.1 | 100.0 |
| 1958—1st quarter | 467.5 | 298.5 | 184.8 | 113.7 | 67.7 | 46.6 | 19.3 | 1.8 | 1.0 | .8 | .2 | 22.5 | 22.3 | 101.0 |
| 2d quarter | 473.5 | 302.9 | 187.3 | 115.7 | 68.2 | 46.3 | 19.2 | 2.8 | 1.0 | 1.8 | .3 | 22.7 | 22.4 | 102.0 |
| 3d quarter | 479.8 | 307.2 | 189.5 | 117.6 | 69.3 | 46.2 | 19.3 | 3.8 | .9 | 2.9 | .3 | 22.9 | 22.6 | 103.1 |
| 4th quarter | 487.1 | 312.8 | 192.5 | 120.3 | 70.4 | 46.6 | 19.5 | 4.3 | .7 | 3.6 | −.2 | 22.7 | 22.9 | 104.1 |
| 1959—1st quarter | 490.1 | 315.9 | 193.9 | 122.0 | 70.3 | 47.2 | 19.7 | 3.3 | .2 | 3.1 | −1.2 | 22.1 | 23.3 | 105.1 |
| 2d quarter | 494.2 | 318.7 | 195.2 | 123.4 | 70.6 | 47.6 | 19.8 | 3.2 | .1 | 3.1 | −1.2 | 22.3 | 23.5 | 106.1 |
| 3d quarter | 501.2 | 322.5 | 197.2 | 125.4 | 71.2 | 48.0 | 19.9 | 3.3 | .0 | 3.3 | .3 | 24.0 | 23.7 | 107.1 |
| 4th quarter | 507.7 | 328.0 | 199.9 | 128.1 | 72.0 | 48.2 | 20.2 | 3.5 | .1 | 3.4 | −.5 | 23.5 | 24.0 | 108.2 |
| 1960—1st quarter | 516.3 | 332.4 | 202.1 | 130.3 | 74.3 | 48.6 | 21.2 | 4.5 | .1 | 4.4 | 1.3 | 25.6 | 24.3 | 108.2 |
| 2d quarter | 522.4 | 335.4 | 203.4 | 131.9 | 74.8 | 49.3 | 21.6 | 3.9 | .3 | 3.6 | 2.1 | 26.7 | 24.6 | 110.2 |
| 3d quarter | 529.9 | 340.6 | 206.0 | 134.6 | 76.2 | 49.8 | 21.8 | 4.7 | .4 | 4.3 | 1.8 | 26.8 | 25.0 | 111.2 |
| 4th quarter | 535.7 | 345.1 | 208.1 | 137.0 | 76.2 | 50.1 | 22.0 | 4.1 | .3 | 3.8 | 2.3 | 27.6 | 25.3 | 112.2 |
| 1961—1st quarter | 539.5 | 348.1 | 209.4 | 138.7 | 76.3 | 50.5 | 21.9 | 3.9 | .3 | 3.6 | 1.9 | 27.6 | 25.7 | 113.2 |
| 2d quarter | 541.5 | 351.3 | 210.9 | 140.4 | 75.4 | 50.7 | 21.6 | 3.1 | .4 | 2.7 | .5 | 26.4 | 25.9 | 114.3 |
| 3d quarter | 545.7 | 354.3 | 212.3 | 142.0 | 75.2 | 50.6 | 21.2 | 3.4 | .4 | 3.0 | .9 | 27.0 | 26.1 | 115.3 |
| 4th quarter | 551.3 | 358.5 | 214.4 | 144.1 | 75.5 | 50.7 | 21.1 | 3.7 | .4 | 3.3 | 1.0 | 27.3 | 26.3 | 116.3 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 557.7 | 363.0 | 216.7 | 146.3 | 76.4 | 51.1 | 21.2 | 4.1 | .2 | 3.9 | 1.0 | 27.5 | 26.5 | 117.3 |
| 2d quarter | 564.7 | 367.8 | 219.0 | 148.8 | 77.6 | 51.5 | 21.6 | 4.6 | .2 | 4.4 | 1.0 | 27.8 | 26.8 | 118.3 |
| 3d quarter | 571.6 | 372.1 | 221.0 | 151.1 | 79.1 | 52.1 | 22.1 | 5.0 | .2 | 4.8 | 1.0 | 28.1 | 27.1 | 119.3 |
| 4th quarter | 577.5 | 376.1 | 222.8 | 153.3 | 80.0 | 52.5 | 22.6 | 4.9 | .2 | 4.7 | 1.0 | 28.4 | 27.4 | 120.4 |
| 1963—1st quarter | 582.6 | 379.8 | 224.4 | 155.4 | 80.4 | 52.7 | 23.0 | 4.7 | .2 | 4.5 | 1.0 | 28.8 | 27.8 | 121.4 |
| 2d quarter | 587.2 | 383.1 | 225.8 | 157.3 | 80.8 | 53.1 | 23.1 | 4.5 | .2 | 4.3 | 1.0 | 29.0 | 28.0 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE II–B–6.—*U.S. economy simulations—Alteration in Government expenditures policy: Relation of GNP and disposable income*

RECESSION OF 1953–54 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1953—3d quarter[2] | 367.1 | 26.8 | 340.3 | 30.4 | 0.8 | −0.5 | 307.2 | 37.5 | 8.7 | −0.1 | 12.8 | 5.2 | 9.4 | 289.9 | 32.5 | 3.5 | 253.9 |
| 4th quarter | 363.9 | 27.4 | 336.5 | 30.2 | 1.2 | −.5 | 303.2 | 34.5 | 9.2 | −.1 | 13.5 | 5.2 | 9.5 | 289.2 | 32.2 | 3.6 | 253.4 |
| 1954—1st quarter | 365.0 | 28.0 | 337.0 | 30.3 | 1.0 | −.4 | 304.1 | 33.8 | 9.3 | .0 | 14.3 | 5.2 | 9.6 | 291.5 | 30.6 | 3.7 | 257.3 |
| 2d quarter | 377.1 | 28.6 | 348.5 | 30.9 | −.8 | −.3 | 316.9 | 37.8 | 10.0 | .0 | 14.4 | 5.3 | 9.9 | 300.1 | 31.9 | 3.8 | 264.4 |
| 3d quarter | 388.8 | 29.2 | 359.6 | 31.9 | .8 | −.2 | 325.5 | 40.9 | 10.6 | .0 | 14.3 | 5.4 | 10.2 | 305.1 | 32.5 | 3.9 | 268.6 |
| 4th quarter | 399.6 | 29.8 | 369.8 | 33.2 | 1.7 | .0 | 333.7 | 43.8 | 11.2 | .0 | 14.2 | 5.6 | 10.6 | 310.2 | 33.1 | 4.0 | 273.0 |
| 1955—1st quarter | 407.4 | 30.6 | 376.8 | 34.2 | 3.7 | −.1 | 337.5 | 45.1 | 11.7 | .1 | 14.2 | 5.7 | 11.0 | 312.7 | 33.1 | 4.2 | 275.5 |
| 2d quarter | 412.7 | 31.4 | 381.4 | 35.0 | −.2 | .0 | 345.2 | 45.5 | 12.0 | .5 | 14.5 | 5.8 | 11.4 | 320.2 | 34.3 | 4.3 | 281.6 |
| 3d quarter | 421.5 | 32.2 | 389.4 | 35.7 | 1.2 | .1 | 351.1 | 47.0 | 12.5 | −.6 | 14.6 | 5.9 | 11.8 | 326.0 | 35.1 | 4.4 | 286.5 |
| 4th quarter | 426.6 | 32.9 | 393.7 | 36.5 | −.9 | .2 | 356.8 | 46.8 | 12.7 | .0 | 14.9 | 6.0 | 12.2 | 331.9 | 35.9 | 4.5 | 291.5 |
| 1956—1st quarter | 431.8 | 33.6 | 398.2 | 37.1 | −1.3 | .8 | 361.7 | 46.5 | 13.0 | .0 | 15.4 | 6.1 | 12.6 | 337.7 | 36.7 | 4.7 | 296.3 |
| 2d quarter | 436.2 | 34.3 | 401.9 | 37.6 | −3.3 | .9 | 366.9 | 45.7 | 13.3 | .0 | 15.9 | 6.2 | 12.9 | 344.6 | 37.8 | 4.8 | 302.0 |
| 3d quarter | 442.2 | 34.9 | 407.3 | 38.1 | −2.8 | 1.0 | 371.4 | 45.5 | 13.6 | .0 | 16.3 | 6.4 | 13.2 | 349.7 | 38.5 | 4.9 | 306.3 |
| 4th quarter | 445.9 | 35.4 | 410.5 | 38.7 | −2.2 | 1.1 | 373.4 | 44.8 | 13.8 | .0 | 16.9 | 6.5 | 13.4 | 353.2 | 38.8 | 5.0 | 309.4 |
| 1957—1st quarter | 452.7 | 36.0 | 416.7 | 39.2 | −.2 | 1.2 | 377.1 | 45.1 | 15.2 | .0 | 17.4 | 6.6 | 13.6 | 356.1 | 38.9 | 5.1 | 312.1 |
| 2d quarter | 456.6 | 36.5 | 420.1 | 39.8 | −1.1 | 1.1 | 380.6 | 44.8 | 15.4 | .0 | 18.0 | 6.8 | 13.8 | 360.7 | 39.5 | 5.3 | 316.0 |
| 3d quarter | 461.9 | 37.0 | 424.8 | 40.3 | −.6 | .9 | 384.1 | 44.6 | 15.7 | .0 | 18.5 | 6.9 | 13.9 | 365.1 | 40.0 | 5.4 | 319.7 |
| 4th quarter | 466.2 | 37.5 | 428.6 | 40.9 | −.3 | .8 | 387.0 | 44.7 | 15.9 | .0 | 19.2 | 7.1 | 14.0 | 368.5 | 40.3 | 5.5 | 322.7 |
| 1958—1st quarter | 467.5 | 38.1 | 429.4 | 41.2 | −1.9 | 1.0 | 389.3 | 43.4 | 16.0 | .6 | 20.0 | 7.2 | 14.0 | 372.3 | 40.7 | 5.6 | 326.0 |
| 2d quarter | 473.5 | 38.6 | 434.9 | 41.6 | −1.0 | 1.2 | 393.7 | 44.2 | 16.4 | .6 | 20.6 | 7.4 | 14.0 | 376.5 | 41.2 | 5.7 | 329.6 |
| 3d quarter | 479.8 | 39.1 | 440.8 | 42.3 | −1.9 | 1.2 | 399.8 | 45.0 | 16.7 | −1.3 | 21.2 | 7.6 | 14.1 | 384.2 | 42.5 | 5.9 | 335.8 |
| 4th quarter | 487.1 | 39.6 | 447.5 | 43.0 | −1.4 | 1.2 | 405.3 | 45.8 | 17.1 | .0 | 21.7 | 7.8 | 14.2 | 388.0 | 42.9 | 6.0 | 339.1 |
| 1959—1st quarter | 490.1 | 40.1 | 450.0 | 43.6 | −.9 | .7 | 406.2 | 44.8 | 17.7 | .0 | 22.4 | 8.0 | 14.3 | 390.2 | 42.9 | 6.1 | 341.2 |
| 2d quarter | 494.2 | 40.6 | 453.5 | 44.0 | −.9 | .5 | 409.2 | 44.6 | 17.9 | .0 | 23.1 | 8.3 | 14.4 | 394.2 | 43.3 | 6.2 | 344.7 |
| 3d quarter | 501.2 | 41.2 | 460.0 | 44.6 | −2.8 | .3 | 416.7 | 45.1 | 18.3 | .0 | 23.7 | 8.5 | 14.4 | 401.7 | 44.6 | 6.3 | 350.7 |
| 4th quarter | 507.7 | 41.7 | 465.9 | 45.3 | −1.8 | .3 | 420.9 | 45.6 | 18.7 | .0 | 24.3 | 8.8 | 14.5 | 406.0 | 45.2 | 6.4 | 354.4 |
| 1960—1st quarter | 516.3 | 42.3 | 473.9 | 46.1 | −1.1 | .5 | 427.6 | 46.8 | 20.8 | .0 | 24.7 | 9.0 | 14.6 | 410.1 | 45.2 | 6.6 | 358.3 |
| 2d quarter | 522.4 | 43.0 | 479.5 | 46.9 | −2.9 | .6 | 434.2 | 46.8 | 21.1 | .0 | 25.3 | 9.3 | 14.6 | 417.4 | 46.5 | 6.7 | 364.1 |
| 3d quarter | 529.9 | 43.6 | 486.3 | 47.7 | −4.0 | .5 | 441.3 | 47.6 | 21.6 | .0 | 25.8 | 9.6 | 14.7 | 424.1 | 47.7 | 6.8 | 369.6 |
| 4th quarter | 535.7 | 44.2 | 491.6 | 48.4 | −2.9 | .5 | 444.8 | 47.5 | 21.9 | .0 | 26.4 | 9.9 | 14.8 | 428.3 | 48.3 | 6.9 | 373.2 |
| 1961—1st quarter | 539.5 | 44.8 | 494.7 | 49.0 | −2.6 | .6 | 447.1 | 47.0 | 22.1 | .0 | 27.2 | 10.3 | 14.8 | 432.2 | 48.7 | 7.0 | 376.4 |
| 2d quarter | 541.5 | 45.3 | 496.2 | 49.3 | −1.7 | .6 | 447.3 | 45.9 | 22.2 | .0 | 28.1 | 10.6 | 14.8 | 434.6 | 48.8 | 7.2 | 378.7 |
| 3d quarter | 545.7 | 45.8 | 499.9 | 49.6 | −1.7 | .6 | 450.7 | 45.8 | 22.4 | .0 | 29.0 | 10.9 | 14.8 | 439.1 | 49.4 | 7.3 | 382.4 |
| 4th quarter | 551.3 | 46.3 | 505.0 | 50.1 | −1.7 | .6 | 455.3 | 46.1 | 22.8 | .0 | 29.8 | 11.3 | 14.9 | 444.2 | 50.2 | 7.4 | 386.6 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962—1st quarter | 557.7 | 46.8 | 510.9 | 50.8 | −2.5 | .6 | 461.3 | 46.7 | 23.1 | .0 | 30.5 | 11.7 | 14.9 | 450.5 | 51.3 | 7.5 | 391.7 |
| 2d quarter | 564.7 | 47.3 | 517.4 | 51.5 | −2.5 | .6 | 467.1 | 47.3 | 23.5 | .0 | 31.1 | 12.2 | 15.0 | 456.4 | 52.3 | 7.6 | 396.4 |
| 3d quarter | 571.6 | 47.9 | 523.7 | 52.3 | −2.5 | .6 | 472.6 | 47.9 | 23.9 | .0 | 31.7 | 12.6 | 15.1 | 462.1 | 53.3 | 7.8 | 401.0 |
| 4th quarter | 577.5 | 48.5 | 529.0 | 53.0 | −2.5 | .6 | 477.2 | 48.1 | 24.2 | .0 | 32.4 | 13.1 | 15.1 | 467.5 | 54.2 | 7.9 | 405.3 |
| 1963—1st quarter | 582.6 | 49.1 | 533.5 | 53.6 | −1.7 | .6 | 480.3 | 48.0 | 24.5 | .0 | 33.2 | 13.6 | 15.2 | 471.7 | 54.8 | 8.0 | 408.8 |
| 2d quarter | 587.2 | 49.7 | 537.6 | 54.1 | −1.7 | .6 | 483.8 | 47.8 | 24.8 | .0 | 34.0 | 14.1 | 15.2 | 476.5 | 55.6 | 8.1 | 412.8 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

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APPENDIX TABLE III–A–1.—*U.S. economy simulations—Pseudo-realistic situation: Gross national product demands*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1957—3d quarter[1] | 448.3 | 288.7 | 180.7 | 108.0 | 67.7 | 48.2 | 17.0 | 2.5 | 0.9 | 1.5 | 5.1 | 26.6 | 21.5 | 86.9 |
| 4th quarter | 445.5 | 288.6 | 178.9 | 109.7 | 65.9 | 47.5 | 18.8 | −.5 | 1.1 | −1.6 | 3.3 | 24.9 | 21.6 | 87.7 |
| 1958—1st quarter | 444.5 | 289.6 | 179.3 | 110.3 | 64.1 | 46.4 | 18.7 | −1.0 | 1.0 | −2.0 | 1.0 | 22.5 | 21.5 | 89.8 |
| 2d quarter | 450.4 | 293.3 | 181.5 | 111.9 | 63.8 | 45.2 | 18.4 | .2 | 1.0 | −.8 | 1.3 | 22.7 | 21.4 | 92.0 |
| 3d quarter | 460.4 | 297.8 | 183.9 | 113.9 | 66.1 | 44.6 | 19.2 | 2.3 | .9 | 1.4 | 1.4 | 22.9 | 21.5 | 95.1 |
| 4th quarter | 471.1 | 304.6 | 187.6 | 117.1 | 68.9 | 44.9 | 19.7 | 4.3 | .7 | 3.6 | .9 | 22.7 | 21.8 | 96.7 |
| 1959—1st quarter | 475.6 | 308.0 | 189.1 | 118.9 | 71.0 | 45.9 | 20.3 | 4.8 | .2 | 4.6 | −.2 | 22.1 | 22.3 | 96.7 |
| 2d quarter | 480.2 | 310.3 | 190.1 | 120.2 | 72.8 | 46.9 | 20.6 | 5.2 | .1 | 5.1 | −.4 | 22.3 | 22.7 | 97.5 |
| 3d quarter | 486.8 | 313.8 | 191.7 | 122.1 | 73.9 | 47.8 | 20.7 | 5.5 | .0 | 5.5 | 1.0 | 24.0 | 23.0 | 98.1 |
| 4th quarter | 489.0 | 318.6 | 194.1 | 124.5 | 73.7 | 48.3 | 20.8 | 4.6 | .1 | 4.5 | .1 | 23.5 | 23.4 | 96.5 |
| 1960—1st quarter | 495.4 | 321.8 | 195.6 | 126.2 | 74.6 | 48.5 | 21.2 | 4.9 | .1 | 4.8 | 2.0 | 25.6 | 23.6 | 96.9 |
| 2d quarter | 501.4 | 324.6 | 196.9 | 127.7 | 74.3 | 48.9 | 21.2 | 4.3 | .3 | 4.0 | 2.9 | 26.7 | 23.8 | 99.6 |
| 3d quarter | 510.2 | 330.2 | 199.8 | 130.5 | 75.4 | 49.1 | 21.3 | 5.0 | .4 | 4.6 | 2.7 | 26.8 | 24.1 | 101.9 |
| 4th quarter | 514.5 | 335.1 | 202.1 | 133.1 | 74.6 | 49.4 | 21.7 | 3.6 | .3 | 3.3 | 3.2 | 27.6 | 24.4 | 101.6 |
| 1961—1st quarter | 522.1 | 337.6 | 203.0 | 134.6 | 76.6 | 49.6 | 21.7 | 5.3 | .3 | 5.0 | 2.9 | 27.6 | 24.7 | 105.0 |
| 2d quarter | 523.9 | 341.3 | 204.7 | 136.6 | 74.0 | 50.2 | 22.0 | 1.9 | .4 | 1.5 | 1.4 | 26.4 | 25.0 | 107.2 |
| 3d quarter | 528.9 | 344.2 | 205.9 | 138.2 | 73.9 | 50.1 | 21.8 | 1.9 | .4 | 1.5 | 1.8 | 27.0 | 25.2 | 109.0 |
| 4th quarter | 536.6 | 348.0 | 207.8 | 140.2 | 74.6 | 50.2 | 21.9 | 2.5 | .4 | 2.1 | 2.0 | 27.3 | 25.3 | 112.1 |
| 1962—1st quarter | 544.7 | 352.4 | 209.9 | 142.6 | 76.6 | 50.8 | 22.2 | 3.6 | .2 | 3.4 | 1.0 | 26.6 | 25.6 | 114.7 |
| 2d quarter | 554.0 | 357.0 | 212.0 | 145.0 | 78.8 | 51.4 | 22.6 | 4.8 | .2 | 4.6 | 1.0 | 27.0 | 26.0 | 117.2 |
| 3d quarter | 561.8 | 361.3 | 214.0 | 147.3 | 81.3 | 52.4 | 23.1 | 5.8 | .2 | 5.6 | 1.0 | 27.4 | 26.4 | 118.2 |
| 4th quarter | 568.3 | 365.0 | 215.7 | 149.4 | 82.7 | 53.1 | 23.5 | 6.1 | .2 | 5.9 | 1.0 | 27.9 | 26.9 | 119.6 |
| 1963—1st quarter | 574.2 | 368.7 | 217.4 | 151.3 | 83.5 | 53.6 | 23.7 | 6.3 | .2 | 6.1 | 1.0 | 28.3 | 27.3 | 121.0 |
| 2d quarter | 579.7 | 372.1 | 219.0 | 153.1 | 84.2 | 54.2 | 23.7 | 6.3 | .2 | 6.1 | 1.0 | 28.7 | 27.7 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–B–1.—*U.S. economy simulations—Pseudo-realistic situation: Relation of GNP and disposable income*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1957—3d quarter[2] | 448.3 | 37.8 | 410.5 | 38.5 | −0.6 | 0.9 | 371.6 | 42.5 | 14.7 | 0.0 | 20.1 | 6.3 | 12.9 | 355.6 | 37.6 | 5.4 | 312.6 |
| 4th quarter | 445.5 | 38.4 | 407.1 | 39.0 | −.3 | .8 | 367.4 | 39.9 | 14.8 | .0 | 21.2 | 6.4 | 12.9 | 355.0 | 37.0 | 5.4 | 312.6 |
| 1958—1st quarter | 444.5 | 38.9 | 405.6 | 39.0 | −1.9 | 1.0 | 367.7 | 38.5 | 14.7 | .6 | 22.3 | 6.5 | 12.9 | 357.3 | 37.1 | 5.5 | 314.7 |
| 2d quarter | 450.4 | 39.3 | 411.1 | 39.3 | −1.0 | 1.2 | 372.2 | 39.6 | 15.1 | .6 | 22.9 | 6.6 | 12.9 | 361.2 | 37.5 | 5.6 | 318.1 |
| 3d quarter | 460.4 | 39.8 | 420.7 | 39.9 | −1.9 | 1.2 | 382.1 | 42.0 | 15.6 | −1.3 | 23.2 | 6.8 | 13.0 | 370.6 | 39.2 | 5.8 | 325.6 |
| 4th quarter | 471.1 | 40.2 | 430.9 | 41.0 | −1.4 | 1.2 | 390.6 | 44.4 | 16.2 | .0 | 23.4 | 7.0 | 13.1 | 375.2 | 39.8 | 5.9 | 329.6 |
| 1959—1st quarter | 475.6 | 40.8 | 434.8 | 41.9 | −.9 | .7 | 392.7 | 44.7 | 16.9 | .0 | 23.9 | 7.1 | 13.3 | 377.1 | 39.7 | 6.0 | 331.5 |
| 2d quarter | 480.2 | 41.4 | 438.8 | 42.4 | −.9 | .5 | 396.0 | 44.9 | 17.1 | .0 | 24.4 | 7.3 | 13.4 | 380.9 | 40.0 | 6.1 | 334.7 |
| 3d quarter | 486.8 | 42.0 | 444.8 | 43.0 | −2.8 | .3 | 403.1 | 45.5 | 17.5 | .0 | 24.9 | 7.5 | 13.6 | 387.8 | 41.2 | 6.2 | 340.4 |
| 4th quarter | 489.0 | 42.6 | 446.4 | 43.5 | −1.8 | .3 | 403.2 | 44.6 | 17.6 | .0 | 25.6 | 7.7 | 13.7 | 389.7 | 41.1 | 6.3 | 342.3 |
| 1960—1st quarter | 495.4 | 43.2 | 452.2 | 44.0 | −1.1 | .5 | 408.0 | 45.2 | 19.6 | .0 | 26.2 | 7.9 | 13.8 | 392.9 | 40.9 | 6.4 | 345.5 |
| 2d quarter | 501.4 | 43.8 | 457.6 | 44.6 | −2.9 | .6 | 414.7 | 45.2 | 20.0 | .0 | 26.7 | 8.1 | 13.9 | 400.0 | 42.2 | 6.6 | 351.3 |
| 3d quarter | 510.2 | 44.4 | 465.8 | 45.4 | −4.0 | .5 | 423.1 | 46.5 | 20.5 | .0 | 27.1 | 8.3 | 14.0 | 407.4 | 43.5 | 6.7 | 357.2 |
| 4th quarter | 514.5 | 45.0 | 469.6 | 46.2 | −2.9 | .5 | 425.0 | 45.7 | 20.7 | .0 | 27.7 | 8.6 | 14.1 | 410.7 | 43.7 | 6.8 | 360.1 |
| 1961—1st quarter | 522.1 | 45.5 | 476.6 | 46.8 | −2.6 | .6 | 431.1 | 47.2 | 21.1 | .0 | 28.2 | 8.8 | 14.2 | 415.9 | 44.5 | 6.9 | 364.4 |
| 2d quarter | 523.9 | 46.1 | 477.8 | 47.4 | −1.7 | .6 | 430.9 | 44.8 | 21.2 | .0 | 29.0 | 9.1 | 14.2 | 418.9 | 44.8 | 7.1 | 367.1 |
| 3d quarter | 528.9 | 46.6 | 482.2 | 47.7 | −1.7 | .6 | 434.9 | 44.9 | 21.5 | .0 | 29.7 | 9.4 | 14.2 | 423.7 | 45.4 | 7.2 | 371.1 |
| 4th quarter | 536.6 | 47.1 | 489.5 | 48.4 | −1.7 | .6 | 441.5 | 45.9 | 21.9 | .0 | 30.2 | 9.7 | 14.3 | 429.8 | 46.5 | 7.3 | 376.0 |
| 1962—1st quarter | 544.7 | 47.7 | 497.0 | 49.3 | −2.5 | .6 | 449.0 | 47.2 | 22.4 | .0 | 30.7 | 10.0 | 14.4 | 436.4 | 47.7 | 7.4 | 381.3 |
| 2d quarter | 554.0 | 48.3 | 505.7 | 50.2 | −2.5 | .6 | 456.7 | 48.7 | 22.9 | .0 | 31.1 | 10.3 | 14.6 | 443.0 | 48.8 | 7.6 | 386.6 |
| 3d quarter | 561.8 | 48.9 | 512.9 | 51.2 | −2.5 | .6 | 463.0 | 49.8 | 23.3 | .0 | 31.6 | 10.7 | 14.7 | 448.7 | 49.8 | 7.7 | 391.2 |
| 4th quarter | 568.3 | 49.5 | 518.8 | 51.9 | −2.5 | .6 | 468.1 | 50.2 | 23.7 | .0 | 32.1 | 11.1 | 14.9 | 454.1 | 50.7 | 7.8 | 395.6 |
| 1963—1st quarter | 574.2 | 50.1 | 524.1 | 52.6 | −1.7 | .6 | 471.8 | 50.4 | 24.0 | .0 | 32.7 | 11.5 | 15.0 | 458.5 | 51.3 | 7.9 | 399.3 |
| 2d quarter | 579.7 | 50.7 | 529.0 | 53.3 | −1.7 | .6 | 476.1 | 50.5 | 24.3 | .0 | 33.4 | 11.9 | 15.2 | 463.6 | 52.1 | 8.0 | 403.5 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–A–2.—*U.S. economy simulations—Tax reduction policy: Gross national product demands*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1957—3d quarter [1] | 448.3 | 288.7 | 180.7 | 108.0 | 67.7 | 48.2 | 17.0 | 2.5 | 0.9 | 1.5 | 5.1 | 26.6 | 21.5 | 86.9 |
| 4th quarter | 445.5 | 288.6 | 178.9 | 109.7 | 65.9 | 47.5 | 18.8 | −.5 | 1.1 | −1.6 | 3.3 | 24.9 | 21.6 | 87.7 |
| 1958—1st quarter | 449.3 | 293.4 | 181.4 | 112.0 | 65.0 | 46.4 | 18.7 | .0 | 1.0 | −1.0 | 1.0 | 22.5 | 21.5 | 89.8 |
| 2d quarter | 455.3 | 297.0 | 183.3 | 113.8 | 65.1 | 45.5 | 18.7 | 0.9 | 1.0 | −.1 | 1.2 | 22.7 | 21.5 | 92.0 |
| 3d quarter | 464.1 | 300.4 | 185.0 | 115.4 | 67.3 | 45.1 | 19.5 | 2.6 | .9 | 1.7 | 1.2 | 22.9 | 21.7 | 95.1 |
| 4th quarter | 473.4 | 306.2 | 188.2 | 118.0 | 69.8 | 45.5 | 19.9 | 4.3 | .7 | 3.6 | .7 | 22.7 | 22.0 | 96.7 |
| 1959—1st quarter | 477.4 | 309.4 | 189.8 | 119.5 | 71.7 | 46.5 | 20.4 | 4.8 | .2 | 4.6 | −.4 | 22.1 | 22.5 | 96.7 |
| 2d quarter | 482.4 | 312.1 | 191.4 | 120.7 | 73.3 | 47.3 | 20.5 | 5.4 | .1 | 5.3 | −.5 | 22.3 | 22.8 | 97.5 |
| 3d quarter | 490.1 | 316.5 | 193.9 | 122.6 | 74.7 | 48.1 | 20.5 | 6.0 | .0 | 6.0 | .9 | 24.0 | 23.1 | 98.1 |
| 4th quarter | 494.1 | 322.7 | 197.4 | 125.3 | 75.0 | 48.7 | 20.7 | 5.6 | .1 | 5.5 | .0 | 23.5 | 23.5 | 96.5 |
| 1960—1st quarter | 502.1 | 327.1 | 199.8 | 127.3 | 76.4 | 49.0 | 21.3 | 6.1 | .1 | 6.0 | 1.8 | 25.6 | 23.8 | 96.9 |
| 2d quarter | 509.5 | 330.7 | 201.8 | 129.0 | 76.6 | 49.6 | 21.5 | 5.6 | .3 | 5.3 | 2.6 | 26.7 | 24.1 | 99.6 |
| 3d quarter | 519.2 | 337.0 | 205.1 | 131.9 | 78.0 | 50.0 | 21.7 | 6.2 | .4 | 5.8 | 2.3 | 26.8 | 24.5 | 101.9 |
| 4th quarter | 524.1 | 342.4 | 207.8 | 134.6 | 77.3 | 50.4 | 22.2 | 4.7 | .3 | 4.4 | 2.7 | 27.6 | 24.9 | 101.6 |
| 1961—1st quarter | 531.9 | 345.3 | 209.1 | 136.2 | 79.2 | 50.8 | 22.1 | 6.4 | .3 | 6.1 | 2.4 | 27.6 | 25.2 | 105.0 |
| 2d quarter | 533.8 | 349.4 | 211.1 | 138.3 | 76.4 | 51.3 | 22.3 | 2.8 | .4 | 2.4 | .8 | 26.4 | 25.6 | 107.2 |
| 3d quarter | 538.9 | 352.6 | 212.7 | 139.9 | 76.0 | 51.2 | 22.0 | 2.8 | .4 | 2.4 | 1.3 | 27.0 | 25.7 | 109.0 |
| 4th quarter | 547.0 | 357.0 | 214.9 | 142.0 | 76.6 | 51.3 | 21.9 | 3.4 | .4 | 3.0 | 1.4 | 27.3 | 25.9 | 112.1 |
| 1962—1st quarter | 556.2 | 362.0 | 217.5 | 144.5 | 78.5 | 51.8 | 22.2 | 4.6 | .2 | 4.4 | 1.0 | 27.2 | 26.2 | 114.7 |
| 2d quarter | 566.5 | 367.4 | 220.2 | 147.1 | 80.9 | 52.4 | 22.5 | 5.9 | .2 | 5.7 | 1.0 | 27.6 | 26.6 | 117.2 |
| 3d quarter | 575.0 | 372.3 | 222.6 | 149.7 | 83.5 | 53.5 | 23.1 | 7.0 | .2 | 6.8 | 1.0 | 28.1 | 27.1 | 118.2 |
| 4th quarter | 582.2 | 376.5 | 224.7 | 151.9 | 85.1 | 54.3 | 23.6 | 7.2 | .2 | 7.0 | 1.0 | 28.6 | 27.6 | 119.6 |
| 1963—1st quarter | 588.6 | 380.6 | 226.7 | 154.0 | 85.9 | 54.7 | 23.8 | 7.4 | .2 | 7.2 | 1.0 | 29.0 | 28.0 | 121.0 |
| 2d quarter | 594.5 | 384.5 | 228.6 | 155.9 | 86.6 | 55.4 | 23.9 | 7.3 | .2 | 7.1 | 1.0 | 29.4 | 28.4 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–B–2.—*U.S. economy simulations—Tax reduction policy: Relation of GNP and disposable income*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1957—3d quarter[2] | 448.3 | 37.8 | 410.5 | 38.5 | −0.6 | 0.9 | 371.6 | 42.5 | 14.7 | 0.0 | 20.1 | 6.3 | 12.9 | 355.6 | 37.6 | 5.4 | 312.6 |
| 4th quarter | 445.5 | 38.4 | 407.1 | 39.0 | −.3 | .8 | 367.4 | 39.9 | 14.8 | .0 | 21.2 | 6.4 | 12.9 | 355.0 | 30.6 | 5.4 | 319.1 |
| 1958—1st quarter | 449.3 | 38.9 | 410.4 | 39.2 | −1.9 | 1.0 | 372.3 | 40.0 | 15.0 | .6 | 22.0 | 6.5 | 13.0 | 359.9 | 31.1 | 5.5 | 323.2 |
| 2d quarter | 455.3 | 39.4 | 416.0 | 39.6 | −1.0 | 1.2 | 376.8 | 40.9 | 15.3 | .6 | 22.6 | 6.6 | 13.0 | 363.9 | 31.5 | 5.6 | 326.8 |
| 3d quarter | 464.1 | 39.8 | 424.2 | 40.4 | −1.9 | 1.2 | 385.1 | 42.8 | 15.8 | −1.3 | 22.9 | 6.8 | 13.1 | 372.4 | 32.7 | 5.8 | 333.9 |
| 4th quarter | 473.4 | 40.3 | 433.1 | 41.4 | −1.4 | 1.2 | 392.5 | 44.8 | 16.3 | .0 | 23.2 | 7.0 | 13.2 | 376.6 | 33.1 | 5.9 | 337.6 |
| 1959—1st quarter | 477.4 | 40.9 | 436.5 | 42.1 | −.9 | .7 | 394.2 | 44.9 | 17.0 | .0 | 23.7 | 7.2 | 13.4 | 378.3 | 33.0 | 6.0 | 339.4 |
| 2d quarter | 482.4 | 41.5 | 440.9 | 42.6 | −.9 | .5 | 397.9 | 45.3 | 17.3 | .0 | 24.3 | 7.3 | 13.6 | 382.3 | 33.3 | 6.1 | 342.8 |
| 3d quarter | 490.1 | 42.1 | 448.1 | 43.3 | −2.8 | .3 | 406.1 | 46.3 | 17.7 | .0 | 24.7 | 7.5 | 13.7 | 389.8 | 34.4 | 6.2 | 349.2 |
| 4th quarter | 494.1 | 42.7 | 451.5 | 44.0 | −1.8 | .3 | 407.8 | 46.0 | 17.9 | .0 | 25.3 | 7.7 | 13.8 | 392.6 | 34.5 | 6.4 | 351.7 |
| 1960—1st quarter | 502.1 | 43.3 | 458.9 | 44.6 | −1.1 | .5 | 414.1 | 46.9 | 20.0 | .0 | 25.7 | 7.9 | 14.0 | 396.6 | 34.5 | 6.5 | 355.6 |
| 2d quarter | 509.5 | 43.9 | 465.6 | 45.4 | −2.9 | .6 | 421.8 | 47.2 | 20.4 | .0 | 26.2 | 8.2 | 14.1 | 404.5 | 35.7 | 6.6 | 362.2 |
| 3d quarter | 519.2 | 44.5 | 474.7 | 46.4 | −4.0 | .5 | 431.0 | 48.6 | 21.0 | .0 | 26.5 | 8.4 | 14.3 | 412.5 | 36.9 | 6.7 | 368.8 |
| 4th quarter | 524.1 | 45.1 | 479.0 | 47.2 | −2.9 | .5 | 433.4 | 47.8 | 21.2 | .0 | 27.1 | 8.7 | 14.4 | 416.3 | 37.3 | 6.9 | 372.1 |
| 1961—1st quarter | 531.9 | 45.7 | 486.2 | 47.9 | −2.6 | .6 | 439.6 | 49.2 | 21.7 | .0 | 27.6 | 8.9 | 14.5 | 421.7 | 38.0 | 7.0 | 376.8 |
| 2d quarter | 533.8 | 46.3 | 487.5 | 48.4 | −1.7 | .6 | 439.4 | 46.7 | 21.8 | .0 | 28.4 | 9.2 | 14.6 | 425.0 | 38.2 | 7.1 | 379.7 |
| 3d quarter | 538.9 | 46.8 | 492.1 | 48.8 | −1.7 | .6 | 443.7 | 46.7 | 22.1 | .0 | 29.1 | 9.5 | 14.6 | 430.1 | 38.8 | 7.2 | 384.0 |
| 4th quarter | 547.0 | 47.3 | 499.7 | 49.5 | −1.7 | .6 | 450.6 | 47.6 | 22.5 | .0 | 29.7 | 9.8 | 14.7 | 436.6 | 39.8 | 7.3 | 389.4 |
| 1962—1st quarter | 556.2 | 47.9 | 508.4 | 50.5 | −2.5 | .6 | 459.1 | 49.1 | 23.0 | .0 | 30.1 | 10.1 | 14.9 | 444.0 | 40.9 | 7.5 | 395.6 |
| 2d quarter | 566.5 | 48.4 | 518.0 | 51.5 | −2.5 | .6 | 467.7 | 50.8 | 23.6 | .0 | 30.5 | 10.5 | 15.1 | 451.3 | 42.1 | 7.6 | 401.6 |
| 3d quarter | 575.0 | 49.0 | 526.0 | 52.6 | −2.5 | .6 | 474.6 | 52.0 | 24.1 | .0 | 30.9 | 10.9 | 15.3 | 457.6 | 43.0 | 7.7 | 406.8 |
| 4th quarter | 582.2 | 49.7 | 532.6 | 53.4 | −2.5 | .6 | 480.3 | 52.4 | 24.5 | .0 | 31.5 | 11.3 | 15.4 | 463.5 | 43.8 | 7.9 | 411.8 |
| 1963—1st quarter | 588.6 | 50.3 | 538.3 | 54.2 | −1.7 | .6 | 484.5 | 52.6 | 24.8 | .0 | 32.1 | 11.7 | 15.6 | 468.4 | 44.5 | 8.0 | 415.9 |
| 2d quarter | 594.5 | 50.9 | 543.5 | 54.9 | −1.7 | .6 | 489.1 | 52.5 | 25.2 | .0 | 32.8 | 12.1 | 15.7 | 473.9 | 45.3 | 8.1 | 420.6 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–A–3.—*U.S. economy simulations—Inventory fluctuation reduction policy: Gross national product demands*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1957—3d quarter[1] | 448.3 | 288.7 | 180.7 | 108.0 | 67.7 | 48.2 | 17.0 | 2.5 | 0.9 | 1.5 | 5.1 | 26.6 | 21.5 | 86.9 |
| 4th quarter | 446.3 | 288.6 | 178.9 | 109.7 | 66.7 | 47.5 | 18.8 | .3 | 1.1 | −.8 | 3.3 | 24.9 | 21.6 | 87.7 |
| 1958—1st quarter | 445.6 | 289.6 | 179.4 | 110.3 | 65.2 | 46.5 | 18.8 | .0 | 1.0 | −1.0 | 1.0 | 22.5 | 21.5 | 89.8 |
| 2d quarter | 451.0 | 293.4 | 181.5 | 111.9 | 64.3 | 45.4 | 18.4 | .5 | 1.0 | −.5 | 1.3 | 22.7 | 21.4 | 92.0 |
| 3d quarter | 459.8 | 297.9 | 184.0 | 113.9 | 65.5 | 44.8 | 19.2 | 1.5 | .9 | .6 | 1.4 | 22.9 | 21.5 | 95.1 |
| 4th quarter | 469.1 | 304.6 | 187.5 | 117.0 | 66.9 | 44.9 | 19.6 | 2.4 | .7 | 1.7 | .9 | 22.7 | 21.8 | 96.7 |
| 1959—1st quarter | 472.8 | 307.8 | 189.0 | 118.8 | 68.3 | 45.7 | 20.1 | 2.5 | .2 | 2.3 | −.1 | 22.1 | 22.2 | 96.7 |
| 2d quarter | 477.0 | 310.1 | 190.0 | 120.1 | 69.6 | 46.4 | 20.3 | 2.9 | .1 | 2.8 | −.2 | 22.3 | 22.5 | 97.5 |
| 3d quarter | 483.5 | 313.6 | 191.7 | 121.9 | 70.6 | 47.0 | 20.4 | 3.2 | .0 | 3.2 | 1.2 | 24.0 | 22.8 | 98.1 |
| 4th quarter | 486.5 | 318.5 | 194.1 | 124.4 | 71.0 | 47.5 | 20.6 | 3.0 | .1 | 2.9 | .4 | 23.5 | 23.1 | 96.5 |
| 1960—1st quarter | 493.1 | 321.8 | 195.6 | 126.2 | 72.1 | 47.7 | 21.1 | 3.3 | .1 | 3.2 | 2.3 | 25.6 | 23.3 | 96.9 |
| 2d quarter | 500.0 | 324.6 | 196.9 | 127.7 | 72.6 | 48.2 | 21.2 | 3.2 | .3 | 2.9 | 3.1 | 26.7 | 23.6 | 99.6 |
| 3d quarter | 508.8 | 330.2 | 199.7 | 130.5 | 73.8 | 48.6 | 21.5 | 3.7 | .4 | 3.3 | 2.9 | 26.8 | 23.9 | 101.9 |
| 4th quarter | 514.0 | 335.0 | 202.0 | 133.1 | 74.0 | 48.9 | 21.9 | 3.1 | .3 | 2.8 | 3.4 | 27.6 | 24.2 | 101.6 |
| 1961—1st quarter | 520.9 | 337.5 | 202.9 | 134.6 | 75.3 | 49.4 | 21.9 | 4.0 | .3 | 3.7 | 3.1 | 27.6 | 24.5 | 105.0 |
| 2d quarter | 524.2 | 341.1 | 204.5 | 136.6 | 74.4 | 49.9 | 22.1 | 2.4 | .4 | 2.0 | 1.5 | 26.4 | 24.9 | 107.2 |
| 3d quarter | 529.4 | 343.9 | 205.7 | 138.2 | 74.6 | 50.1 | 22.0 | 2.5 | .4 | 2.1 | 1.9 | 27.0 | 25.1 | 109.0 |
| 4th quarter | 536.9 | 347.7 | 207.5 | 140.2 | 75.1 | 50.4 | 22.0 | 2.7 | .4 | 2.3 | 2.0 | 27.3 | 25.3 | 112.1 |
| 1962—1st quarter | 544.2 | 352.1 | 209.6 | 142.5 | 76.4 | 51.0 | 22.2 | 3.1 | .2 | 2.9 | 1.0 | 26.6 | 25.6 | 114.7 |
| 2d quarter | 552.7 | 356.6 | 211.7 | 144.9 | 77.9 | 51.6 | 22.5 | 3.8 | .2 | 3.6 | 1.0 | 27.0 | 26.0 | 117.2 |
| 3d quarter | 559.8 | 360.9 | 213.7 | 147.2 | 79.7 | 52.4 | 22.9 | 4.3 | .2 | 4.1 | 1.0 | 27.4 | 26.4 | 118.2 |
| 4th quarter | 566.0 | 364.6 | 215.4 | 149.2 | 80.8 | 53.0 | 23.3 | 4.6 | .2 | 4.4 | 1.0 | 27.7 | 26.7 | 119.6 |
| 1963—1st quarter | 571.8 | 368.3 | 217.1 | 151.2 | 81.6 | 53.2 | 23.5 | 4.8 | .2 | 4.6 | 1.0 | 28.1 | 27.1 | 121.0 |
| 2d quarter | 577.5 | 371.7 | 218.7 | 153.0 | 82.4 | 53.8 | 23.6 | 5.0 | .2 | 4.8 | 1.0 | 28.4 | 27.4 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–B–3.—*U.S. economy simulations—Inventory fluctuation reduction policy: Relation of GNP and disposable income*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1957—3d quarter[2] | 448.3 | 37.8 | 410.5 | 38.5 | −0.6 | 0.9 | 371.6 | 42.5 | 14.7 | 0.0 | 20.1 | 6.3 | 12.9 | 355.6 | 37.6 | 5.4 | 312.6 |
| 4th quarter | 446.3 | 38.4 | 407.9 | 39.1 | −.3 | .8 | 368.1 | 40.4 | 14.8 | .0 | 21.2 | 6.4 | 13.0 | 355.2 | 37.1 | 5.4 | 312.7 |
| 1958—1st quarter | 445.6 | 38.9 | 406.7 | 39.0 | −1.9 | 1.0 | 368.8 | 39.2 | 14.8 | .6 | 22.2 | 6.5 | 12.9 | 357.6 | 37.2 | 5.5 | 314.9 |
| 2d quarter | 451.0 | 39.4 | 411.7 | 39.3 | −1.0 | 1.2 | 372.8 | 39.8 | 15.1 | .6 | 22.9 | 6.6 | 12.9 | 361.5 | 37.6 | 5.6 | 318.3 |
| 3d quarter | 459.8 | 39.8 | 420.0 | 39.9 | −1.9 | 1.2 | 381.4 | 41.4 | 15.6 | −1.3 | 23.3 | 6.8 | 13.0 | 370.6 | 39.2 | 5.8 | 325.6 |
| 4th quarter | 469.1 | 40.3 | 428.8 | 40.9 | −1.4 | 1.2 | 388.7 | 43.0 | 16.1 | .0 | 23.5 | 7.0 | 13.1 | 375.0 | 39.7 | 5.9 | 329.4 |
| 1959—1st quarter | 472.8 | 40.8 | 432.0 | 41.6 | −.9 | .7 | 390.1 | 43.0 | 16.7 | .0 | 24.1 | 7.1 | 13.2 | 376.6 | 39.6 | 6.0 | 331.1 |
| 2d quarter | 477.0 | 41.3 | 435.7 | 42.1 | −.9 | .5 | 393.2 | 43.1 | 17.0 | .0 | 24.7 | 7.3 | 13.3 | 380.2 | 39.9 | 6.1 | 334.2 |
| 3d quarter | 483.5 | 41.9 | 441.6 | 42.6 | −2.8 | .3 | 400.3 | 43.7 | 17.3 | .0 | 25.2 | 7.5 | 13.4 | 387.1 | 41.0 | 6.2 | 339.8 |
| 4th quarter | 486.5 | 42.5 | 444.0 | 43.2 | −1.8 | .3 | 401.1 | 43.4 | 17.5 | .0 | 25.8 | 7.7 | 13.5 | 389.0 | 40.9 | 6.3 | 341.8 |
| 1960—1st quarter | 493.1 | 43.1 | 450.0 | 43.7 | −1.1 | .5 | 406.1 | 44.0 | 19.5 | .0 | 26.4 | 7.9 | 13.6 | 392.2 | 40.7 | 6.4 | 345.1 |
| 2d quarter | 500.0 | 43.7 | 456.3 | 44.4 | −2.9 | .6 | 413.5 | 44.5 | 19.9 | .0 | 26.8 | 8.1 | 13.7 | 399.5 | 42.0 | 6.6 | 350.9 |
| 3d quarter | 508.8 | 44.3 | 464.5 | 45.3 | −4.0 | .5 | 422.0 | 45.7 | 20.4 | .0 | 27.2 | 8.3 | 13.8 | 406.9 | 43.4 | 6.7 | 356.9 |
| 4th quarter | 514.0 | 44.9 | 469.1 | 46.1 | −2.9 | .5 | 424.6 | 45.6 | 20.7 | .0 | 27.7 | 8.6 | 13.8 | 410.3 | 43.7 | 6.8 | 359.9 |
| 1961—1st quarter | 520.9 | 45.5 | 475.4 | 46.7 | −2.6 | .6 | 430.0 | 46.5 | 21.0 | .0 | 28.2 | 8.8 | 13.9 | 415.4 | 44.4 | 6.9 | 364.0 |
| 2d quarter | 524.2 | 46.0 | 478.2 | 47.3 | −1.7 | .6 | 431.3 | 45.4 | 21.2 | .0 | 28.9 | 9.1 | 14.0 | 418.6 | 44.7 | 7.1 | 366.9 |
| 3d quarter | 529.4 | 46.6 | 482.8 | 47.8 | −1.7 | .6 | 435.4 | 45.5 | 21.5 | .0 | 29.6 | 9.4 | 14.1 | 423.4 | 45.4 | 7.2 | 370.8 |
| 4th quarter | 536.9 | 47.1 | 489.7 | 48.4 | −1.7 | .6 | 441.7 | 46.2 | 21.9 | .0 | 30.1 | 9.7 | 14.2 | 429.4 | 46.4 | 7.3 | 375.8 |
| 1962—1st quarter | 544.2 | 47.7 | 496.5 | 49.3 | −2.5 | .6 | 448.4 | 47.0 | 22.4 | .0 | 30.6 | 10.0 | 14.3 | 436.0 | 47.5 | 7.4 | 381.0 |
| 2d quarter | 552.7 | 48.3 | 504.4 | 50.1 | −2.5 | .6 | 455.5 | 48.1 | 22.8 | .0 | 31.1 | 10.4 | 14.5 | 442.4 | 48.7 | 7.6 | 386.2 |
| 3d quarter | 559.8 | 48.9 | 510.9 | 51.0 | −2.5 | .6 | 461.1 | 48.8 | 23.2 | .0 | 31.6 | 10.7 | 14.6 | 447.9 | 49.6 | 7.7 | 390.6 |
| 4th quarter | 566.0 | 49.5 | 516.5 | 51.7 | −2.5 | .6 | 466.0 | 49.2 | 23.6 | .0 | 32.2 | 11.1 | 14.7 | 453.1 | 50.4 | 7.8 | 394.9 |
| 1963—1st quarter | 571.8 | 50.1 | 521.7 | 52.4 | −1.7 | .6 | 469.7 | 49.4 | 23.9 | .0 | 32.8 | 11.5 | 14.8 | 457.5 | 51.0 | 7.9 | 398.5 |
| 2d quarter | 577.5 | 50.7 | 526.8 | 53.0 | −1.7 | .6 | 474.2 | 49.6 | 24.2 | .0 | 33.5 | 11.9 | 15.0 | 462.6 | 51.8 | 8.0 | 402.7 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–A–4.—*U.S. economy simulations—Orders fluctuation reduction policy: Gross national product demands*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1957—3d quarter [1] | 448.3 | 288.7 | 180.7 | 108.0 | 67.7 | 48.2 | 17.0 | 2.5 | 0.9 | 1.5 | 5.1 | 26.6 | 21.5 | 86.9 |
| 4th quarter | 445.5 | 288.6 | 178.9 | 109.7 | 65.9 | 47.5 | 18.8 | −.5 | 1.1 | −1.6 | 3.3 | 24.9 | 21.6 | 87.7 |
| 1958—1st quarter | 445.1 | 289.6 | 179.3 | 110.3 | 64.7 | 46.4 | 18.7 | −.3 | 1.0 | −1.3 | 1.0 | 22.5 | 21.5 | 89.8 |
| 2d quarter | 451.4 | 293.4 | 181.5 | 111.9 | 64.8 | 45.3 | 18.4 | 1.1 | 1.0 | .1 | 1.3 | 22.7 | 21.4 | 92.0 |
| 3d quarter | 461.4 | 297.9 | 184.0 | 113.9 | 67.0 | 44.8 | 19.3 | 2.9 | .9 | 2.0 | 1.4 | 22.9 | 21.5 | 95.1 |
| 4th quarter | 471.5 | 304.7 | 187.6 | 117.1 | 69.3 | 45.1 | 19.7 | 4.5 | .7 | 3.8 | .8 | 22.7 | 21.9 | 96.7 |
| 1959—1st quarter | 475.3 | 308.0 | 189.1 | 118.9 | 70.9 | 46.1 | 20.3 | 4.4 | .2 | 4.2 | −.3 | 22.1 | 22.4 | 96.7 |
| 2d quarter | 479.3 | 310.3 | 190.0 | 120.2 | 71.9 | 47.0 | 20.6 | 4.4 | .1 | 4.3 | −.4 | 22.3 | 22.7 | 97.5 |
| 3d quarter | 485.6 | 313.7 | 191.7 | 122.0 | 72.7 | 47.7 | 20.5 | 4.5 | .0 | 4.5 | 1.0 | 24.0 | 23.0 | 98.1 |
| 4th quarter | 487.7 | 318.6 | 194.1 | 124.5 | 72.4 | 48.1 | 20.6 | 3.7 | .1 | 3.6 | .2 | 23.5 | 23.3 | 96.5 |
| 1960—1st quarter | 494.3 | 321.8 | 195.6 | 126.2 | 73.5 | 48.2 | 21.1 | 4.2 | .1 | 4.1 | 2.1 | 25.6 | 23.5 | 96.9 |
| 2d quarter | 500.9 | 324.6 | 197.0 | 127.7 | 73.6 | 48.5 | 21.1 | 4.0 | .3 | 3.7 | 3.0 | 26.7 | 23.7 | 99.6 |
| 3d quarter | 510.2 | 330.3 | 199.8 | 130.5 | 75.2 | 48.9 | 21.3 | 5.1 | .4 | 4.7 | 2.8 | 26.8 | 24.0 | 101.9 |
| 4th quarter | 515.1 | 335.2 | 202.1 | 133.1 | 75.0 | 49.2 | 21.8 | 4.0 | .3 | 3.7 | 3.2 | 27.6 | 24.4 | 101.6 |
| 1961—1st quarter | 523.0 | 337.7 | 203.1 | 134.6 | 77.4 | 49.6 | 21.8 | 5.9 | .3 | 5.6 | 2.9 | 27.6 | 24.7 | 105.0 |
| 2d quarter | 525.0 | 341.4 | 204.7 | 136.7 | 75.1 | 50.3 | 22.1 | 2.6 | .4 | 2.2 | 1.3 | 26.4 | 25.1 | 107.2 |
| 3d quarter | 529.9 | 344.2 | 205.9 | 138.3 | 74.9 | 50.4 | 22.0 | 2.6 | .4 | 2.2 | 1.8 | 27.0 | 25.2 | 109.0 |
| 4th quarter | 537.4 | 348.0 | 207.7 | 140.3 | 75.5 | 50.5 | 21.9 | 3.0 | .4 | 2.6 | 1.9 | 27.3 | 25.4 | 112.1 |
| 1962—1st quarter | 545.3 | 352.4 | 209.8 | 142.6 | 77.2 | 51.0 | 22.2 | 3.9 | .2 | 3.7 | 1.0 | 26.7 | 25.7 | 114.7 |
| 2d quarter | 554.2 | 357.0 | 212.0 | 145.0 | 79.0 | 51.6 | 22.5 | 4.9 | .2 | 4.7 | 1.0 | 27.1 | 26.1 | 117.2 |
| 3d quarter | 561.6 | 361.3 | 214.0 | 147.3 | 81.1 | 52.5 | 23.0 | 5.6 | .2 | 5.4 | 1.0 | 27.5 | 26.5 | 118.2 |
| 4th quarter | 567.8 | 365.0 | 215.7 | 149.3 | 82.2 | 53.2 | 23.3 | 5.7 | .2 | 5.5 | 1.0 | 27.9 | 26.9 | 119.6 |
| 1963—1st quarter | 573.6 | 368.7 | 217.4 | 151.3 | 82.9 | 53.5 | 23.5 | 5.8 | .2 | 5.6 | 1.0 | 28.3 | 27.3 | 121.0 |
| 2d quarter | 579.1 | 372.1 | 219.0 | 153.1 | 83.6 | 54.1 | 23.6 | 5.9 | .2 | 5.7 | 1.0 | 28.6 | 27.6 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–B–4.—*U.S. economy simulations—Orders fluctuation reduction policy: Relation of GNP and disposable income*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1957—3d quarter[2] | 448.3 | 37.8 | 410.5 | 38.5 | −0.6 | 0.9 | 371.6 | 42.5 | 14.7 | 0.0 | 20.1 | 6.3 | 12.9 | 355.6 | 37.6 | 5.4 | 312.6 |
| 4th quarter | 445.5 | 38.4 | 407.1 | 39.0 | −.3 | .8 | 367.4 | 39.9 | 14.8 | .0 | 21.2 | 6.4 | 12.9 | 355.0 | 37.0 | 5.4 | 312.6 |
| 1958—1st quarter | 445.1 | 38.9 | 406.3 | 39.0 | −1.9 | 1.0 | 368.3 | 39.0 | 14.8 | .6 | 22.2 | 6.5 | 12.9 | 357.4 | 37.1 | 5.5 | 314.8 |
| 2d quarter | 451.4 | 39.3 | 412.1 | 39.3 | −1.0 | 1.2 | 373.2 | 40.2 | 15.1 | .6 | 22.9 | 6.6 | 12.9 | 361.4 | 37.6 | 5.6 | 318 3 |
| 3d quarter | 461.4 | 39.8 | 421.6 | 40.0 | −1.9 | 1.2 | 382.9 | 42.4 | 15.7 | −1.3 | 23.2 | 6.8 | 13.0 | 370.8 | 39.3 | 5.8 | 325.8 |
| 4th quarter | 471.5 | 40.3 | 431.2 | 41.1 | −1.4 | 1.2 | 390.9 | 44.6 | 16.2 | .0 | 23.3 | 7.0 | 13.2 | 375.4 | 39.8 | 5.9 | 329.7 |
| 1959—1st quarter | 475.3 | 40.8 | 434.5 | 41.9 | −.9 | .7 | 392.4 | 44.4 | 16.9 | .0 | 23.9 | 7.1 | 13.3 | 377.2 | 39.7 | 6.0 | 331.5 |
| 2d quarter | 479.3 | 41.4 | 437.9 | 42.3 | −.9 | .5 | 395.2 | 44.3 | 17.1 | .0 | 24.5 | 7.3 | 13.5 | 380.8 | 40.0 | 6.1 | 334.7 |
| 3d quarter | 485.6 | 42.0 | 443.6 | 42.9 | −2.8 | .3 | 402.0 | 44.7 | 17.4 | .0 | 25.0 | 7.5 | 13.6 | 387.6 | 41.1 | 6.2 | 340.3 |
| 4th quarter | 487.7 | 42.6 | 445.1 | 43.4 | −1.8 | .3 | 402.0 | 43.9 | 17.5 | .0 | 25.7 | 7.7 | 13.7 | 389.4 | 41.0 | 6.3 | 342.1 |
| 1960—1st quarter | 494.3 | 43.2 | 451.1 | 43.8 | −1.1 | .5 | 407.1 | 44.6 | 19.6 | .0 | 26.3 | 7.9 | 13.8 | 392.6 | 40.8 | 6.4 | 345.3 |
| 2d quarter | 500.9 | 43.8 | 457.1 | 44.5 | −2.9 | .6 | 414.2 | 45.0 | 19.9 | .0 | 26.8 | 8.1 | 13.8 | 399.8 | 42.1 | 6.6 | 351.2 |
| 3d quarter | 510.2 | 44.3 | 465.9 | 45.4 | −4.0 | .5 | 423.2 | 46.6 | 20.5 | .0 | 27.1 | 8.3 | 13.9 | 407.4 | 43.5 | 6.7 | 357.2 |
| 4th quarter | 515.1 | 44.9 | 470.1 | 46.2 | −2.9 | .5 | 425.5 | 46.1 | 20.7 | .0 | 27.7 | 8.6 | 14.0 | 410.8 | 43.8 | 6.8 | 360.2 |
| 1961—1st quarter | 523.0 | 45.5 | 477.6 | 46.9 | −2.6 | .6 | 432.0 | 47.8 | 21.2 | .0 | 28.1 | 8.8 | 14.1 | 416.1 | 44.6 | 6.9 | 364.5 |
| 2d quarter | 525.0 | 46.1 | 479.0 | 47.5 | −1.7 | .6 | 431.9 | 45.5 | 21.3 | .0 | 28.9 | 9.1 | 14.2 | 419.2 | 44.8 | 7.1 | 367 3 |
| 3d quarter | 529.9 | 46.6 | 483.3 | 47.8 | −1.7 | .6 | 435.8 | 45.5 | 21.6 | .0 | 29.6 | 9.4 | 14.2 | 423.9 | 45.5 | 7.2 | 371.3 |
| 4th quarter | 537.4 | 47.2 | 490.3 | 48.5 | −1.7 | .6 | 442.2 | 46.3 | 22.0 | .0 | 30.2 | 9.7 | 14.3 | 430.0 | 46.5 | 7.3 | 376.2 |
| 1962—1st quarter | 545.3 | 47.7 | 497.5 | 49.3 | −2.5 | .6 | 449.4 | 47.4 | 22.4 | .0 | 30.6 | 10.0 | 14.5 | 436.6 | 47.7 | 7.4 | 381.5 |
| 2d quarter | 554.2 | 48.3 | 505.9 | 50.3 | −2.5 | .6 | 456.8 | 48.7 | 22.9 | .0 | 31.1 | 10.4 | 14.6 | 443.1 | 48.9 | 7.6 | 386.7 |
| 3d quarter | 561.6 | 48.9 | 512.6 | 51.2 | −2.5 | .6 | 462.7 | 49.6 | 23.3 | .0 | 31.6 | 10.7 | 14.8 | 448.7 | 49.8 | 7.7 | 391.2 |
| 4th quarter | 567.8 | 49.5 | 518.3 | 51.9 | −2.5 | .6 | 467.6 | 49.9 | 23.7 | .0 | 32.1 | 11.1 | 14.9 | 454.0 | 50.6 | 7.8 | 395.6 |
| 1963—1st quarter | 573.6 | 50.1 | 523.4 | 52.6 | −1.7 | .6 | 471.3 | 50.1 | 24.0 | .0 | 32.8 | 11.5 | 15.0 | 458.4 | 51.3 | 7.9 | 399.2 |
| 2d quarter | 579.1 | 50.7 | 528.4 | 53.2 | −1.7 | .6 | 475.6 | 50.2 | 24.3 | .0 | 33.5 | 11.9 | 15.2 | 463.6 | 52.1 | 8.0 | 403.4 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–A–5.—*U.S. economy simulations—Inventory and orders fluctuation reduction policy: Gross national product demands*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | | | | |
| | | Total | Goods | Services | | | | Total | Farm | Nonfarm | Total | Exports | Imports | |
| 1957—3d quarter [1] | 448.3 | 288.7 | 180.7 | 108.0 | 67.7 | 48.2 | 17.0 | 2.5 | 0.9 | 1.5 | 5.1 | 26.6 | 21.5 | 86.9 |
| 4th quarter | 446.3 | 288.6 | 178.9 | 109.7 | 66.7 | 47.5 | 18.8 | .3 | 1.1 | −.8 | 3.3 | 24.9 | 21.6 | 87.7 |
| 1958—1st quarter | 446.0 | 289.6 | 179.4 | 110.3 | 65.5 | 46.5 | 18.8 | .3 | 1.0 | −.7 | 1.0 | 22.5 | 21.5 | 89.8 |
| 2d quarter | 451.6 | 293.5 | 181.5 | 111.9 | 64.9 | 45.5 | 18.5 | .9 | 1.0 | −.1 | 1.2 | 22.7 | 21.5 | 92.0 |
| 3d quarter | 460.3 | 297.9 | 184.0 | 114.0 | 66.0 | 44.9 | 19.3 | 1.8 | .9 | .9 | 1.3 | 22.9 | 21.6 | 95.1 |
| 4th quarter | 469.4 | 304.6 | 187.5 | 117.1 | 67.2 | 45.0 | 19.7 | 2.5 | .7 | 1.8 | .9 | 22.7 | 21.8 | 96.7 |
| 1959—1st quarter | 472.8 | 307.9 | 189.0 | 118.8 | 68.3 | 45.8 | 20.1 | 2.4 | .2 | 2.2 | −.1 | 22.1 | 22.2 | 96.7 |
| 2d quarter | 476.7 | 310.1 | 190.0 | 120.1 | 69.3 | 46.4 | 20.3 | 2.5 | .1 | 2.4 | −.2 | 22.3 | 22.5 | 97.5 |
| 3d quarter | 483.0 | 313.6 | 191.7 | 121.9 | 70.0 | 47.0 | 20.3 | 2.7 | .0 | 2.7 | 1.3 | 24.0 | 22.7 | 98.1 |
| 4th quarter | 485.8 | 318.5 | 194.1 | 124.4 | 70.4 | 47.3 | 20.5 | 2.5 | .1 | 2.4 | .5 | 23.5 | 23.0 | 96.5 |
| 1960—1st quarter | 492.5 | 321.7 | 195.6 | 126.1 | 71.5 | 47.6 | 21.0 | 2.9 | .1 | 2.8 | 2.4 | 25.6 | 23.2 | 96.9 |
| 2d quarter | 499.5 | 324.6 | 196.9 | 127.7 | 72.1 | 48.0 | 21.2 | 3.0 | .3 | 2.7 | 3.2 | 26.7 | 23.5 | 99.6 |
| 3d quarter | 508.7 | 330.2 | 199.8 | 130.5 | 73.6 | 48.4 | 21.5 | 3.7 | .4 | 3.3 | 3.0 | 26.8 | 23.8 | 101.9 |
| 4th quarter | 514.1 | 335.1 | 202.0 | 133.1 | 74.0 | 48.8 | 21.9 | 3.2 | .3 | 2.9 | 3.4 | 27.6 | 24.2 | 101.6 |
| 1961—1st quarter | 521.2 | 337.5 | 202.9 | 134.6 | 75.6 | 49.4 | 22.0 | 4.3 | .3 | 4.0 | 3.1 | 27.6 | 24.5 | 105.0 |
| 2d quarter | 524.7 | 341.1 | 204.5 | 136.6 | 74.9 | 50.0 | 22.2 | 2.8 | .4 | 2.4 | 1.5 | 26.4 | 24.9 | 107.2 |
| 3d quarter | 529.9 | 343.9 | 205.7 | 138.2 | 75.1 | 50.2 | 22.1 | 2.8 | .4 | 2.4 | 1.9 | 27.0 | 25.1 | 109.0 |
| 4th quarter | 537.3 | 347.7 | 207.5 | 140.2 | 75.6 | 50.6 | 22.0 | 3.0 | .4 | 2.6 | 1.9 | 27.3 | 25.4 | 112.1 |
| 1962—1st quarter | 544.6 | 352.1 | 209.6 | 142.5 | 76.8 | 51.1 | 22.3 | 3.4 | .2 | 3.2 | 1.0 | 26.7 | 25.7 | 114.7 |
| 2d quarter | 552.9 | 356.6 | 211.7 | 144.9 | 78.1 | 51.7 | 22.5 | 3.9 | .2 | 3.7 | 1.0 | 27.0 | 26.0 | 117.2 |
| 3d quarter | 559.8 | 360.9 | 213.7 | 147.2 | 79.7 | 52.5 | 22.9 | 4.3 | .2 | 4.1 | 1.0 | 27.4 | 26.4 | 118.2 |
| 4th quarter | 565.9 | 364.6 | 215.4 | 149.2 | 80.7 | 53.0 | 23.2 | 4.5 | .2 | 4.3 | 1.0 | 27.8 | 26.8 | 119.6 |
| 1963—1st quarter | 571.6 | 368.2 | 217.1 | 151.2 | 81.3 | 53.2 | 23.4 | 4.7 | .2 | 4.5 | 1.0 | 28.1 | 27.1 | 121.0 |
| 2d quarter | 577.2 | 371.7 | 218.7 | 153.0 | 82.1 | 53.8 | 23.5 | 4.8 | .2 | 4.6 | 1.0 | 28.4 | 27.4 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–B–5.—*U.S. economy simulations—Inventory and orders fluctuation reduction policy: Relation of GNP and disposable income*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1957—3d quarter[2] | 448.3 | 37.8 | 410.5 | 38.5 | −0.6 | 0.9 | 371.6 | 42.5 | 14.7 | 0.0 | 20.1 | 6.3 | 12.9 | 355.6 | 37.6 | 5.4 | 312.6 |
| 4th quarter | 446.3 | 38.4 | 407.9 | 39.1 | −.3 | .8 | 368.1 | 40.4 | 14.8 | .0 | 21.2 | 6.4 | 13.0 | 355.2 | 37.1 | 5.4 | 312.7 |
| 1958—1st quarter | 446.0 | 38.9 | 407.1 | 39.1 | −1.9 | 1.0 | 369.1 | 39.4 | 14.8 | .6 | 22.2 | 6.5 | 13.0 | 357.6 | 37.2 | 5.5 | 314.9 |
| 2d quarter | 451.6 | 39.4 | 412.2 | 39.3 | −1.0 | 1.2 | 373.3 | 40.1 | 15.1 | .6 | 22.8 | 6.6 | 13.0 | 361.6 | 37.6 | 5.6 | 318.4 |
| 3d quarter | 460.3 | 39.8 | 420.5 | 40.0 | −1.9 | 1.2 | 384.9 | 41.6 | 15.6 | −1.3 | 23.2 | 6.8 | 13.0 | 370.7 | 39.2 | 5.8 | 325.7 |
| 4th quarter | 469.4 | 40.3 | 429.1 | 40.9 | −1.4 | 1.2 | 389.0 | 43.1 | 16.1 | .0 | 23.5 | 7.0 | 13.1 | 375.1 | 39.7 | 5.9 | 329.5 |
| 1959—1st quarter | 472.8 | 40.8 | 431.9 | 41.7 | −.9 | .7 | 390.1 | 42.9 | 16.7 | .0 | 24.0 | 7.1 | 13.2 | 376.7 | 39.6 | 6.0 | 331.1 |
| 2d quarter | 476.7 | 41.4 | 435.3 | 42.1 | −.9 | .5 | 392.9 | 42.8 | 16.9 | .0 | 24.7 | 7.3 | 13.3 | 380.2 | 39.9 | 6.1 | 334.2 |
| 3d quarter | 483.0 | 41.9 | 441.1 | 42.6 | −2.8 | .3 | 399.8 | 43.4 | 17.3 | .0 | 25.2 | 7.5 | 13.4 | 387.0 | 41.0 | 6.2 | 339.8 |
| 4th quarter | 485.8 | 42.5 | 443.3 | 43.1 | −1.8 | .3 | 400.5 | 43.0 | 17.4 | .0 | 25.9 | 7.7 | 13.5 | 388.9 | 40.9 | 6.3 | 341.7 |
| 1960—1st quarter | 492.5 | 43.1 | 449.4 | 43.6 | −1.1 | .5 | 405.6 | 43.7 | 19.5 | .0 | 26.4 | 7.9 | 13.6 | 392.1 | 40.7 | 6.4 | 345.0 |
| 2d quarter | 499.5 | 43.7 | 455.9 | 44.4 | −2.9 | .6 | 413.2 | 44.3 | 19.9 | .0 | 26.9 | 8.1 | 13.6 | 399.4 | 42.0 | 6.6 | 350.8 |
| 3d quarter | 508.7 | 44.3 | 464.4 | 45.2 | −4.0 | .5 | 421.9 | 45.7 | 20.4 | .0 | 27.2 | 8.3 | 13.7 | 406.9 | 43.3 | 6.7 | 356.8 |
| 4th quarter | 514.1 | 44.8 | 469.2 | 46.1 | −2.9 | .5 | 424.8 | 45.7 | 20.1 | .0 | 27.7 | 8.6 | 13.8 | 410.4 | 43.7 | 6.8 | 359.9 |
| 1961—1st quarter | 521.2 | 45.4 | 475.8 | 46.7 | −2.6 | .6 | 430.3 | 46.7 | 21.2 | .0 | 28.2 | 8.8 | 13.9 | 415.4 | 44.4 | 6.9 | 364.1 |
| 2d quarter | 524.7 | 46.0 | 478.7 | 47.3 | −1.7 | .6 | 431.7 | 45.7 | 21.3 | .0 | 28.9 | 9.1 | 14.0 | 418.7 | 44.7 | 7.1 | 366.9 |
| 3d quarter | 529.9 | 46.6 | 483.3 | 47.8 | −1.7 | .6 | 435.9 | 45.8 | 21.6 | .0 | 29.6 | 9.4 | 14.1 | 423.5 | 45.4 | 7.2 | 370.9 |
| 4th quarter | 537.3 | 47.2 | 490.2 | 48.5 | −1.7 | .6 | 442.1 | 46.5 | 22.0 | .0 | 30.1 | 9.7 | 14.2 | 429.6 | 46.4 | 7.3 | 375.8 |
| 1962—1st quarter | 544.6 | 47.7 | 496.9 | 49.3 | −2.5 | .6 | 448.8 | 47.2 | 22.4 | .0 | 30.6 | 10.0 | 14.3 | 436.1 | 47.6 | 7.4 | 381.1 |
| 2d quarter | 552.9 | 48.3 | 504.6 | 50.2 | −2.5 | .6 | 455.7 | 48.2 | 22.8 | .0 | 31.1 | 10.4 | 14.5 | 442.5 | 48.7 | 7.6 | 386.2 |
| 3d quarter | 559.8 | 48.9 | 510.9 | 51.0 | −2.5 | .6 | 461.1 | 48.8 | 23.2 | .0 | 31.6 | 10.7 | 14.6 | 447.9 | 49.6 | 7.7 | 390.7 |
| 4th quarter | 565.9 | 49.5 | 516.4 | 51.7 | −2.5 | .6 | 465.9 | 49.1 | 23.6 | .0 | 32.2 | 11.1 | 14.7 | 453.1 | 50.4 | 7.8 | 394.9 |
| 1963—1st quarter | 571.6 | 50.1 | 521.5 | 52.4 | −1.7 | .6 | 469.5 | 49.3 | 23.9 | .0 | 32.8 | 11.5 | 14.9 | 457.4 | 51.0 | 7.9 | 398.5 |
| 2d quarter | 577.2 | 50.7 | 526.5 | 53.0 | −1.7 | .6 | 473.9 | 49.4 | 24.2 | .0 | 33.5 | 11.9 | 15.0 | 462.6 | 51.8 | 8.0 | 402.7 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–A–6.—*U.S. economy simulations—Alteration in Government expenditures policy: Gross national product demands*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1957—3d quarter [1] | 448.3 | 288.7 | 180.7 | 108.0 | 67.7 | 48.2 | 17.0 | 2.5 | 0.9 | 1.5 | 5.1 | 26.6 | 21.5 | 86.9 |
| 4th quarter | 446.0 | 288.6 | 178.9 | 109.7 | 65.7 | 47.5 | 18.8 | −.6 | 1.1 | −1.7 | 3.3 | 24.9 | 21.6 | 88.4 |
| 1958—1st quarter | 444.2 | 289.8 | 179.4 | 110.3 | 63.4 | 46.4 | 18.7 | −1.8 | 1.0 | −2.8 | 1.0 | 22.5 | 21.5 | 90.0 |
| 2d quarter | 449.4 | 293.3 | 181.4 | 111.9 | 63.2 | 45.1 | 18.3 | −.2 | 1.0 | −1.2 | 1.4 | 22.7 | 21.3 | 91.5 |
| 3d quarter | 457.7 | 297.6 | 183.8 | 113.8 | 65.5 | 44.4 | 19.1 | 2.0 | .9 | 1.1 | 1.5 | 22.9 | 21.4 | 93.1 |
| 4th quarter | 467.8 | 304.0 | 187.2 | 116.7 | 68.3 | 44.6 | 19.5 | 4.2 | .7 | 3.5 | 1.0 | 22.7 | 21.7 | 94.6 |
| 1959—1st quarter | 473.6 | 307.5 | 188.8 | 118.6 | 70.0 | 45.6 | 20.0 | 4.4 | .2 | 4.2 | −.1 | 22.1 | 22.2 | 96.2 |
| 2d quarter | 480.1 | 310.4 | 190.2 | 120.2 | 72.3 | 46.6 | 20.5 | 5.2 | .1 | 5.1 | −.3 | 22.3 | 22.6 | 97.7 |
| 3d quarter | 488.6 | 314.2 | 192.0 | 122.2 | 74.1 | 47.6 | 20.7 | 5.8 | .0 | 5.8 | 1.1 | 24.0 | 22.9 | 99.2 |
| 4th quarter | 495.3 | 319.2 | 194.4 | 124.9 | 75.1 | 48.4 | 21.1 | 5.7 | .1 | 5.6 | .1 | 23.5 | 23.4 | 100.8 |
| 1960—1st quarter | 504.4 | 323.1 | 196.2 | 127.0 | 77.1 | 49.0 | 21.9 | 6.2 | .1 | 6.1 | 1.9 | 25.6 | 23.7 | 102.3 |
| 2d quarter | 509.4 | 325.9 | 197.4 | 128.5 | 77.0 | 49.8 | 22.0 | 5.2 | .3 | 4.9 | 2.5 | 26.7 | 24.2 | 103.9 |
| 3d quarter | 515.9 | 330.6 | 199.7 | 130.9 | 77.5 | 50.3 | 22.0 | 5.3 | .4 | 4.9 | 2.3 | 26.8 | 24.5 | 105.4 |
| 4th quarter | 521.5 | 334.9 | 201.7 | 133.2 | 76.8 | 50.4 | 22.0 | 4.4 | .3 | 4.1 | 2.8 | 27.6 | 24.8 | 107.0 |
| 1961—1st quarter | 525.5 | 338.0 | 203.1 | 134.9 | 76.4 | 50.6 | 21.8 | 4.0 | .3 | 3.7 | 2.5 | 27.6 | 25.1 | 108.5 |
| 2d quarter | 528.0 | 341.4 | 204.8 | 136.6 | 75.4 | 50.7 | 21.6 | 3.1 | .4 | 2.7 | 1.1 | 26.4 | 25.3 | 110.1 |
| 3d quarter | 533.1 | 344.5 | 206.4 | 138.2 | 75.4 | 50.6 | 21.4 | 3.4 | .4 | 3.0 | 1.6 | 27.0 | 25.4 | 111.6 |
| 4th quarter | 539.8 | 348.9 | 208.6 | 140.3 | 76.2 | 50.8 | 21.5 | 3.9 | .4 | 3.5 | 1.7 | 27.3 | 25.6 | 113.1 |
| 1962—1st quarter | 546.8 | 353.5 | 210.9 | 142.6 | 77.6 | 51.2 | 21.9 | 4.5 | .2 | 4.3 | 1.0 | 26.9 | 25.9 | 114.7 |
| 2d quarter | 554.7 | 358.2 | 213.2 | 145.0 | 79.3 | 51.8 | 22.3 | 5.2 | .2 | 5.0 | 1.0 | 27.2 | 26.2 | 116.2 |
| 3d quarter | 562.5 | 362.5 | 215.2 | 147.3 | 81.2 | 52.5 | 22.9 | 5.8 | .2 | 5.6 | 1.0 | 27.6 | 26.6 | 117.8 |
| 4th quarter | 569.3 | 366.6 | 217.1 | 149.5 | 82.4 | 53.1 | 23.4 | 5.9 | .2 | 5.7 | 1.0 | 28.0 | 27.0 | 119.3 |
| 1963—1st quarter | 575.2 | 370.4 | 218.8 | 151.6 | 83.0 | 53.4 | 23.7 | 5.9 | .2 | 5.7 | 1.0 | 28.4 | 27.4 | 120.9 |
| 2d quarter | 580.7 | 373.7 | 220.3 | 153.4 | 83.6 | 54.0 | 23.8 | 5.9 | .2 | 5.7 | 1.0 | 28.7 | 27.7 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE III–B–6.—*U.S. economy simulations—Alteration in Government expenditures policy: Gross national product and disposable income*

RECESSION OF 1957–58 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1957—3d quarter[2] | 448.3 | 37.8 | 410.5 | 38.5 | −0.6 | 0.9 | 371.6 | 42.5 | 14.7 | 0.0 | 20.1 | 6.3 | 12.9 | 355.6 | 37.6 | 5.4 | 312.6 |
| 4th quarter | 446.0 | 38.4 | 407.7 | 39.1 | −.3 | .8 | 367.9 | 39.9 | 14.8 | .0 | 21.2 | 6.4 | 12.9 | 355.5 | 37.2 | 5.4 | 312.9 |
| 1958—1st quarter | 444.2 | 38.9 | 405.3 | 39.0 | −1.9 | 1.0 | 367.4 | 38.0 | 14.7 | .6 | 22.3 | 6.5 | 12.9 | 357.5 | 37.2 | 5.5 | 314.8 |
| 2d quarter | 449.4 | 39.3 | 410.1 | 39.2 | −1.0 | 1.2 | 371.2 | 39.1 | 15.0 | .6 | 23.0 | 6.6 | 12.9 | 360.8 | 37.4 | 5.6 | 317.8 |
| 3d quarter | 457.7 | 39.8 | 417.9 | 39.7 | −1.9 | 1.2 | 379.5 | 41.2 | 15.5 | −1.3 | 23.4 | 6.8 | 12.9 | 369.0 | 38.8 | 5.8 | 324.4 |
| 4th quarter | 467.8 | 40.2 | 427.6 | 40.7 | −1.4 | 1.2 | 387.7 | 43.7 | 16.0 | .0 | 23.6 | 6.9 | 13.1 | 373.4 | 39.3 | 5.9 | 328.2 |
| 1959—1st quarter | 473.6 | 40.7 | 432.9 | 41.6 | −.9 | .7 | 391.1 | 44.2 | 16.8 | .0 | 24.0 | 7.1 | 13.2 | 376.3 | 39.5 | 6.0 | 330.8 |
| 2d quarter | 480.1 | 41.3 | 438.8 | 42.3 | −.9 | .5 | 396.1 | 45.0 | 17.1 | .0 | 24.5 | 7.3 | 13.4 | 380.9 | 40.1 | 6.1 | 334.7 |
| 3d quarter | 488.6 | 41.9 | 446.6 | 43.1 | −2.8 | .3 | 404.8 | 46.2 | 17.6 | .0 | 24.8 | 7.5 | 13.5 | 388.7 | 41.4 | 6.2 | 341.1 |
| 4th quarter | 495.3 | 42.6 | 452.7 | 43.9 | −1.8 | .3 | 409.1 | 46.6 | 18.0 | .0 | 25.2 | 7.7 | 13.7 | 392.9 | 41.9 | 6.4 | 344.7 |
| 1960—1st quarter | 504.4 | 43.2 | 461.1 | 44.8 | −1.1 | .5 | 416.2 | 47.8 | 20.1 | .0 | 25.5 | 7.9 | 13.9 | 397.4 | 42.0 | 6.5 | 348.9 |
| 2d quarter | 509.4 | 43.9 | 465.5 | 45.6 | −2.9 | .6 | 421.6 | 47.3 | 20.4 | .0 | 26.1 | 8.1 | 14.1 | 403.9 | 43.1 | 6.6 | 354.2 |
| 3d quarter | 515.9 | 44.6 | 471.3 | 46.2 | −4.0 | .5 | 427.8 | 47.7 | 20.8 | .0 | 26.6 | 8.4 | 14.2 | 410.3 | 44.2 | 6.7 | 359.3 |
| 4th quarter | 521.5 | 45.2 | 476.3 | 46.9 | −2.9 | .5 | 431.1 | 47.3 | 21.1 | .0 | 27.2 | 8.6 | 14.3 | 414.5 | 44.7 | 6.8 | 362.9 |
| 1961—1st quarter | 525.5 | 45.7 | 479.7 | 47.4 | −2.6 | .6 | 433.6 | 46.9 | 21.3 | .0 | 27.9 | 8.9 | 14.3 | 418.4 | 45.2 | 7.0 | 366.3 |
| 2d quarter | 528.0 | 46.2 | 481.7 | 47.8 | −1.7 | .6 | 434.4 | 45.9 | 21.4 | .0 | 28.7 | 9.1 | 14.4 | 421.1 | 45.3 | 7.1 | 368.7 |
| 3d quarter | 533.1 | 46.7 | 486.4 | 48.2 | −1.7 | .6 | 438.6 | 46.1 | 21.7 | .0 | 29.4 | 9.4 | 14.5 | 425.9 | 46.0 | 7.2 | 372.7 |
| 4th quarter | 539.8 | 47.2 | 492.6 | 48.8 | −1.7 | .6 | 444.2 | 46.8 | 22.1 | .0 | 30.1 | 9.7 | 14.5 | 431.5 | 46.9 | 7.3 | 377.3 |
| 1962—1st quarter | 546.8 | 47.8 | 499.0 | 49.6 | −2.5 | .6 | 450.7 | 47.6 | 22.5 | .0 | 30.6 | 10.0 | 14.7 | 437.8 | 48.0 | 7.4 | 382.4 |
| 2d quarter | 554.7 | 48.3 | 506.4 | 50.4 | −2.5 | .6 | 457.2 | 48.5 | 22.9 | .0 | 31.1 | 10.4 | 14.8 | 443.9 | 49.1 | 7.6 | 387.3 |
| 3d quarter | 562.5 | 48.9 | 513.6 | 51.2 | −2.5 | .6 | 463.6 | 49.4 | 23.4 | .0 | 31.6 | 10.7 | 14.9 | 450.0 | 50.1 | 7.7 | 392.2 |
| 4th quarter | 569.3 | 49.5 | 519.8 | 52.0 | −2.5 | .6 | 469.0 | 49.9 | 23.8 | .0 | 32.2 | 11.1 | 15.0 | 455.6 | 51.1 | 7.8 | 396.7 |
| 1963—1st quarter | 575.2 | 50.1 | 525.1 | 52.7 | −1.7 | .6 | 472.8 | 50.0 | 24.1 | .0 | 32.8 | 11.5 | 15.2 | 460.1 | 51.7 | 7.9 | 400.4 |
| 2d quarter | 580.7 | 50.7 | 530.0 | 53.4 | −1.7 | .6 | 477.0 | 50.0 | 24.4 | .0 | 33.5 | 11.9 | 15.3 | 465.2 | 52.5 | 8.1 | 404.6 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE IV–A–1.—*U.S. economy simulations—Pseudo-realistic situation: Gross national product demands*

RECESSION OF 1960-61 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Personal consumption expenditure | | | Gross private domestic investment | | | | | | Net foreign investment | | | Government purchases of goods and services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Goods | Services | Total | Business construction and equipment investment | Nonfarm residential construction | Inventory investment | | | Total | Exports | Imports | |
| | | | | | | | | Total | Farm | Nonfarm | | | | |
| 1960—2d quarter [1] | 506.4 | 329.9 | 198.7 | 131.2 | 74.6 | 48.0 | 21.2 | 5.4 | 0.3 | 5.1 | 2.3 | 26.7 | 24.4 | 99.6 |
| 3d quarter | 503.9 | 329.0 | 194.9 | 134.2 | 70.7 | 48.3 | 20.7 | 1.7 | .4 | 1.3 | 2.2 | 26.8 | 24.6 | 101.9 |
| 4th quarter | 507.5 | 332.1 | 196.4 | 135.7 | 70.6 | 48.1 | 21.2 | 1.3 | .3 | 1.0 | 3.1 | 27.6 | 24.5 | 101.6 |
| 1961—1st quarter | 516.4 | 335.2 | 198.0 | 137.3 | 73.1 | 48.1 | 21.2 | 3.7 | .3 | 3.4 | 3.1 | 27.6 | 24.5 | 105.0 |
| 2d quarter | 520.4 | 340.0 | 200.4 | 139.5 | 71.6 | 48.6 | 21.6 | 1.4 | .4 | 1.0 | 1.7 | 26.4 | 24.7 | 107.2 |
| 3d quarter | 527.2 | 343.3 | 202.0 | 141.3 | 72.8 | 48.7 | 21.9 | 2.1 | .4 | 1.7 | 2.1 | 27.0 | 24.9 | 109.0 |
| 4th quarter | 536.3 | 347.5 | 204.1 | 143.4 | 74.6 | 49.2 | 22.2 | 3.1 | .4 | 2.7 | 2.1 | 27.3 | 25.2 | 112.1 |
| 1962—1st quarter | 545.0 | 352.1 | 206.4 | 145.7 | 77.3 | 50.2 | 22.8 | 4.3 | .2 | 4.1 | 1.0 | 26.5 | 25.5 | 114.7 |
| 2d quarter | 554.4 | 356.6 | 208.5 | 148.1 | 79.6 | 51.2 | 23.2 | 5.3 | .2 | 5.1 | 1.0 | 27.0 | 26.0 | 117.2 |
| 3d quarter | 561.7 | 360.8 | 210.4 | 150.3 | 81.8 | 52.3 | 23.6 | 5.9 | .2 | 5.7 | 1.0 | 27.4 | 26.4 | 118.2 |
| 4th quarter | 567.6 | 364.3 | 212.1 | 152.2 | 82.7 | 53.1 | 23.7 | 5.9 | .2 | 5.7 | 1.0 | 27.9 | 26.9 | 119.6 |
| 1963—1st quarter | 572.8 | 367.9 | 213.8 | 154.1 | 82.9 | 53.4 | 23.6 | 5.8 | .2 | 5.6 | 1.0 | 28.3 | 27.3 | 121.0 |
| 2d quarter | 577.9 | 371.3 | 215.5 | 155.8 | 83.2 | 53.9 | 23.5 | 5.8 | .2 | 5.6 | 1.0 | 28.6 | 27.6 | 122.4 |

[1] Figures for 1st quarter of recession period are initial starting conditions.

APPENDIX TABLE IV-B-1.—*U.S. economy simulations—Pseudo-realistic situation: Relation of GNP and disposable income*

RECESSION OF 1960-61 TO 1963, 2D QUARTER

[Billions of current dollars; seasonally adjusted at annual rates]

| Period | GNP | Capital consumption allowance | NNP | Indirect business tax and nontax liability | Statistical discrepancy | Subsidies less current surplus of Government enterprises | National income[1] | Corporate profits and IVA | Contributions for social insurance | Excess of wage accruals over disbursements | Government transfer payments to persons | Net interest paid by Government | Dividends | Personal income[1] | Personal tax and nontax payments | | Personal disposable income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Federal | State and local | |
| 1960—2d quarter[2] | 506.4 | 43.0 | 463.4 | 45.9 | −2.9 | 0.6 | 419.2 | 45.9 | 20.7 | 0.0 | 26.8 | 7.8 | 14.0 | 403.0 | 43.3 | 7.2 | 352.5 |
| 3d quarter | 503.9 | 43.6 | 460.3 | 45.4 | −4.0 | .5 | 417.6 | 43.8 | 20.1 | .0 | 28.0 | 8.0 | 14.0 | 405.5 | 43.0 | 6.7 | 355.8 |
| 4th quarter | 507.5 | 44.2 | 463.3 | 45.6 | −2.9 | .5 | 419.3 | 43.4 | 20.3 | .0 | 28.8 | 8.2 | 14.0 | 408.4 | 43.2 | 6.8 | 358.4 |
| 1961—1st quarter | 516.4 | 44.7 | 471.7 | 46.1 | −2.6 | .6 | 426.9 | 45.6 | 20.8 | .0 | 29.3 | 8.4 | 14.1 | 414.2 | 44.1 | 6.9 | 363.2 |
| 2d quarter | 520.4 | 45.3 | 475.1 | 46.8 | −1.7 | .6 | 428.6 | 44.3 | 21.0 | .0 | 30.0 | 8.7 | 14.1 | 418.0 | 44.5 | 7.0 | 366.4 |
| 3d quarter | 527.2 | 45.9 | 481.3 | 47.4 | −1.7 | .6 | 434.3 | 45.1 | 21.4 | .0 | 30.5 | 8.9 | 14.1 | 423.2 | 45.3 | 7.2 | 370.7 |
| 4th quarter | 536.3 | 46.4 | 489.9 | 48.3 | −1.7 | .6 | 442.0 | 46.6 | 21.9 | .0 | 30.9 | 9.2 | 14.2 | 429.8 | 46.5 | 7.3 | 376.0 |
| 1962—1st quarter | 545.0 | 47.0 | 498.0 | 49.3 | −2.5 | .6 | 450.0 | 48.1 | 22.4 | .0 | 31.3 | 9.5 | 14.4 | 436.6 | 47.7 | 7.4 | 381.5 |
| 2d quarter | 554.4 | 47.7 | 506.8 | 50.3 | −2.5 | .6 | 457.7 | 49.5 | 22.9 | .0 | 31.6 | 9.8 | 14.6 | 443.3 | 48.9 | 7.6 | 386.8 |
| 3d quarter | 561.7 | 48.3 | 513.4 | 51.2 | −2.5 | .6 | 463.4 | 50.3 | 23.3 | .0 | 32.1 | 10.2 | 14.8 | 448.7 | 49.8 | 7.7 | 391.3 |
| 4th quarter | 567.6 | 49.0 | 518.6 | 51.9 | −2.5 | .6 | 467.9 | 50.4 | 23.7 | .0 | 32.7 | 10.5 | 14.9 | 453.8 | 50.6 | 7.8 | 395.4 |
| 1963—1st quarter | 572.8 | 49.6 | 523.2 | 52.5 | −1.7 | .6 | 471.0 | 50.3 | 24.0 | .0 | 33.4 | 10.9 | 15.0 | 458.0 | 51.1 | 7.9 | 398.9 |
| 2d quarter | 577.9 | 50.2 | 527.7 | 53.1 | −1.7 | .6 | 475.0 | 50.2 | 24.2 | .0 | 34.1 | 11.3 | 15.2 | 462.9 | 51.9 | 8.0 | 402.9 |

[1] Includes adjustment for business transfer payments, not shown separately.
[2] Figures for 1st quarter of recession period are initial starting conditions.

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