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Chapter IV

QUARTERLY ESTIMATES: OUTLAY

LET us turn now to the problem of deriving quarterly estimates from the annual totals presented above. In this chapter the interpolation of the data for outlay will be undertaken. The succeeding chapter will be devoted to a similar treatment of the income estimates; and the results will be summarized and compared in Chapter VI. So far as possible the data have been interpolated before adjustment for seasonal variation, so that many of the series are shown both with and without such adjustment. In the present chapter, for instance, Tables 9 and 10 contain quarterly estimates before adjustment for seasonal variation, while Table 11 reproduces the same data after this adjustment has been made. For a few items, however, it has been possible to present the figures only in seasonally adjusted form.

§1. *Consumers' Outlay: Commodities*

In general the derivation of quarterly estimates resolves itself into the problem of finding suitable interpolating series for each individual component of the annual totals. In the commodity field much of the available material—indexes of production and the like—is physical in character, and has to be placed on a current money value basis before it can be used. Bureau of Labor Statistics and other price indexes have been employed for this purpose in the present study. Sometimes the resultant inter-

polating series are relevant to the flow of goods leaving the manufacturer, i.e. before allowance for transportation costs, distributive margins and changes in distributive inventories. Such series cannot be used directly without adjustment for these factors. The interpolating medium for the food group, obtained by multiplying the Federal Reserve Board index of production by the BLS index of wholesale prices, is an example of such a series. In other cases it has been possible to use series already appropriate for the interpolation of the flow of the commodity as it reaches the final consumer. An example of such treatment is the use of new passenger car registrations for the automobile component of the consumers' durable group.

Experience with data of this kind suggests that in interpolating consumers' outlay the second method—the use of sales data, or of other series which refer to the actual passage of commodities into the hands of the consumer—is greatly to be preferred to the use of production or shipment data, with all the attendant adjustments the latter require. I believe that sales data are superior for this purpose, in spite of the fact that they rarely yield a satisfactory breakdown by commodities. Their principal advantage is that no adjustment for changes in distributive inventories is required. But there are subsidiary advantages as well: no attention need be paid to variation in transportation costs and distributive mark-ups, and for the most part there is no danger of including variations in the output of unfinished as well as of finished commodities. These advantages generally outweigh whatever shortcomings are characteristic of sales data—the uncertainties of coverage, and the fact that they are usually broken down on an industrial rather than a commodity basis.

Unfortunately sales (or similar) series available before

1936 are confined to department store data, automobile registrations, some rather miscellaneous data for variety chains (which it was not found possible to use for this investigation), and scattered material relating to the sales of drug chains. For minor groups not covered by these series I have had to employ production data, making as many of the required adjustments as possible. Since 1936 the Department of Commerce has begun the collection of sales data, monthly and quarterly, on a rather comprehensive basis. This new material covers practically the entire range of consumption goods, and will greatly simplify the construction of short run measures of consumers' outlay in the future. It has been used in the present study for the years 1937 and 1938.

It is appropriate at this point to discuss further the methods followed for the period 1921-36. Each minor commodity group distinguished by Kuznets in *Commodity Flow and Capital Formation* is treated separately, so far as possible. The actual series used in the process of interpolation are listed in the notes accompanying the various tables. In the choice of series to serve as a basis for the interpolation of individual minor groups, considerable weight has been attached to the closeness of the agreement between the series in question and the annual totals. Although a consistent bias has not led to the rejection of the series, suitable allowance has of course been made for it. In such cases, and in instances of chance disagreement (though not on a scale sufficient to lead to the rejection of the series), I have been careful to secure comparability over year ends. This problem, common to all such interpolations, has already been discussed in Chapter I, §3; its solution, through the graduation of raising factors, precludes perfect agreement between the annual totals and the sum, year by year, of the quarterly estimates derived from them.

All the minor groups which constitute a major commodity group (perishable, semidurable and durable) have been interpolated at the same stage in their flow. Thus consumers' perishable commodities, which (for 1921-36) rest largely upon output data, have been placed upon a quarterly basis at manufacturers' values (see Kuznets, *Commodity Flow and Capital Formation*, Volume I, Table II-5), and then carried through the subsequent adjustments with such allowance as was possible for quarterly variation in transportation costs and distributive margins. Consumers' semidurable and durable commodities on the other hand, for which sales data are generally available throughout the entire period, have been interpolated at the final stage as they reach the consumer.¹

It follows that the semidurable and durable groups require no further adjustment for changes in distributive inventories. By contrast the derivation of the series for perishables requires (for years prior to 1937) that the net change in wholesale and retail inventories be deducted quarter by quarter. Unfortunately I have been quite unable to find any satisfactory quarterly material in the field of wholesale inventories; while for retail inventories the principal series available—that for department store stocks prepared by the Federal Reserve Board—clearly is heavily weighted with durable commodities. Consequently it has not been possible to adjust the series for perishables in the required manner, and as a result the quarterly consumption data for years prior to 1937 suffer from a rather serious weakness.² The data shown

¹ Although quarterly data are not shown separately for these two groups, they were interpolated separately for 1921-36. The segregation is precarious, however, and for 1937-38 could not be made at all, owing to the use of sales data.

² Some idea of the magnitude of the required adjustment, which it is impossible to make, may be gained from Kuznets' *Commodity Flow and Capital Formation*, Vol. I (National Bureau of Economic Research, 1938), Table V-6, where for 1919-33 the

here for 1937 and 1938, and materials now becoming available for the future extension of the series for consumers' outlay, are free from this difficulty; but on the other hand such series, constructed from sales data, at present allow no satisfactory breakdown between the semidurable and durable groups.

The quarterly estimates for consumers' outlay on commodities are shown in the first three columns of Table 9, and the source material is indicated in detail in notes to that table.

§2. *Consumers' Outlay: Services*

In the interpolation of the annual estimates (Table 1) for services rendered directly to consumers, a different set of difficulties is encountered. For many individual items in this group (see Appendix A) the annual estimates already suffer from a wider margin of error than is the case with the commodity figures, all of which are subject to biennial census inquiry. For this reason the quarterly estimates for services may be less reliable than for commodities. Of the totals for consumer services shown in Table 1 and itemized in Table 22 (including rentals, paid and imputed), about one fourth is composed of items (e.g. electric current, gas, telephones, railroads, hotels) which are immediately available on a quarterly basis. We might handle the remaining three fourths on the basis of the portion for which we already have quarterly data, or of the remainder of consumption. Since, however, the items for which we do not possess quarterly material

annual inventory change for perishables sometimes runs as high as a billion dollars (current prices). According to these data, perishable inventories in the hands of distributors declined sharply in 1921, 1930, 1931 and 1932, and for these years the data for outlay on perishables in Table 9 therefore represent an understatement. For other years the errors appear to be less important.

TABLE 9

CONSUMERS' OUTLAY, QUARTERLY 1921-38^a
 Columns 1 to 5 before Adjustment for Seasonal Variation

Billions of current dollars

Year and Quarter	Perishable Commodities ^b	Semidurable and Durable Commodities ^c	Total Commodities ^d	Services ^e	Total Consumption ^f	Total Consumption, Seasonally Adjusted ^g
	(1)	(2)	(3)	(4)	(5)	(6)
1921						
i	5,442	3,438	8,880	4,882	13,762	14,381
ii	5,016	4,160	9,176	4,864	14,040	14,040
iii	5,179	3,396	8,575	4,854	13,429	13,886
iv	5,204	4,454	9,658	4,932	14,590	13,583
1922						
i	4,926	3,179	8,105	4,962	13,067	13,655
ii	5,076	4,220	9,296	5,044	14,340	14,340
iii	5,335	3,567	8,902	5,109	14,011	14,487
iv	6,028	5,308	11,336	5,285	16,621	15,474
1923						
i	5,746	3,753	9,499	5,400	14,899	15,569
ii	5,584	5,049	10,633	5,500	16,133	16,133
iii	5,514	4,336	9,850	5,600	15,450	15,975
iv	6,125	6,124	12,249	5,736	17,985	16,744
1924						
i	5,948	4,559	10,507	5,805	16,312	17,046
ii	5,475	4,883	10,358	5,839	16,197	16,197
iii	5,909	4,137	10,046	5,877	15,923	16,464
iv	6,578	5,804	12,382	5,960	18,342	17,076
1925						
i	6,455	4,220	10,675	6,033	16,708	17,460
ii	5,947	5,461	11,408	6,031	17,439	17,439
iii	6,348	4,452	10,800	6,109	16,909	17,484
iv	6,934	6,397	13,331	6,205	19,536	18,188
1926						
i	6,634	4,484	11,118	6,243	17,361	18,142
ii	6,503	5,657	12,160	6,250	18,410	18,410
iii	6,836	4,885	11,721	6,290	18,011	18,623
iv	7,049	6,343	13,392	6,374	19,766	18,402
1927						
i	6,509	4,538	11,047	6,420	17,467	18,253
ii	6,497	5,499	11,996	6,421	18,417	18,417
iii	6,414	4,567	10,981	6,462	17,443	18,036
iv	6,888	6,187	13,075	6,510	19,585	18,234

TABLE 9 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
1928						
i	7,104	4,483	11,587	6,562	18,149	18,966
ii	6,621	5,552	12,173	6,560	18,733	18,733
iii	6,796	4,984	11,780	6,609	18,389	19,014
iv	7,346	6,570	13,916	6,689	20,605	19,183
1929						
i	7,001	4,957	11,958	6,776	18,734	19,577
ii	6,719	6,010	12,729	6,734	19,463	19,463
iii	7,154	5,189	12,343	6,791	19,134	19,785
iv	7,144	6,360	13,504	6,763	20,267	18,869
1930						
i	6,568	4,322	10,890	6,680	17,570	18,361
ii	6,424	5,121	11,545	6,481	18,026	18,026
iii	6,203	3,886	10,089	6,432	16,521	17,083
iv	6,067	5,076	11,143	6,292	17,435	16,232
1931						
i	5,560	3,530	9,090	6,131	15,221	15,906
ii	5,133	4,204	9,337	5,893	15,230	15,230
iii	5,186	3,136	8,322	5,724	14,046	14,524
iv	5,182	4,105	9,287	5,533	14,820	13,797
1932						
i	4,666	2,542	7,208	5,290	12,498	13,060
ii	4,279	2,866	7,145	4,981	12,126	12,126
iii	4,353	2,164	6,517	4,818	11,335	11,720
iv	4,278	2,983	7,261	4,704	11,965	11,139
1933						
i	3,882	1,884	5,766	4,542	10,308	10,772
ii	4,743	2,679	7,422	4,409	11,831	11,831
iii	5,247	2,528	7,775	4,400	12,175	12,589
iv	4,884	3,299	8,183	4,441	12,624	11,753
1934						
i	5,160	2,464	7,624	4,490	12,114	12,659
ii	5,309	3,203	8,512	4,485	12,997	12,997
iii	6,210	2,765	8,975	4,561	13,536	13,996
iv	6,242	3,786	10,028	4,649	14,677	13,664
1935						
i	5,526	2,831	8,357	4,721	13,078	13,667
ii	5,429	3,659	9,088	4,743	13,831	13,831
iii	5,558	3,127	8,685	4,862	13,547	14,008
iv	6,010	4,490	10,500	4,982	15,482	14,414

TABLE 9 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
1936						
i	5,918	3,230	9,148	5,111	14,259	14,901
ii	5,857	4,385	10,242	5,136	15,378	15,378
iii	6,345	3,676	10,021	5,292	15,313	15,834
iv	6,928	5,292	12,220	5,428	17,648	16,430
1937						
i	6,072	3,673	9,745	5,520	15,265	15,952
ii	6,223	4,362	10,585	5,539	16,124	16,124
iii	6,878	4,164	11,042	5,654	16,696	17,264
iv	7,355	5,357	12,712	5,620	18,332	17,067
1938						
i	5,829	2,905	8,734	5,618	14,352	14,998
ii	5,873	3,344	9,217	5,532	14,749	14,749
iii	6,326	3,112	9,438	5,569	15,007	15,517
iv	7,187	5,193	12,380	5,588	17,968	16,728

^a As explained in the text, the methods of interpolation adopted do not allow the quarterly estimates always to add up exactly to the annual figures from which they are derived. In consequence discrepancies—for the most part unimportant—will be observable between this table and Table 1. The only serious disagreement will be found in the data for perishables (column 1 of this table, line 1 of Table 1); this disagreement is discussed briefly in footnote b below.

In the notes to this table, the classification of commodities by "minor groups" follows the scheme adopted by Kuznets in *Commodity Flow and Capital Formation*.

^b The figures for consumers' perishable include an estimate for the imputed value of commodities produced and consumed on farms.

For 1921-36 the principal data used in the interpolation are as follows: Minor Group 1, Food products—Federal Reserve Board index of food production; Bureau of Labor Statistics wholesale food prices. Minor Group 2, Tobacco products—consumption and wholesale prices of cigars and cigarettes, *Survey of Current Business*. Minor Group 3, Drugs—1921-29, drugs, wholesale distribution, Federal Reserve Board; 1930-38, specially computed index derived from chain drug store sales (data taken from the *Commercial and Financial Chronicle*). Minor Group 4, Paper products—paper shipments, *Survey of Current Business*; Bureau of Labor Statistics wholesale prices of pulp and paper. Minor Group 5a, Petroleum products—domestic consumption and retail prices of gasoline, *Survey of Current Business*. Minor Group 5b, Coal—coal output and consumption data from *Survey of Current Business and Mineral Resources*.

For 1936-38 retail sales data published by the Department of Commerce were available.

The quarterly estimates for consumers' perishable shown in column 1 of Table 9 run as much as \$1 billion below Kuznets' estimates (shown in Table 1) for 1921 and 1930, and over \$2 billion (or about 10 percent) above Kuznets' estimates for 1934. Most of the discrepancies in question, up to and including the year 1932, are accounted for by the fact that the quarterly estimates for perishables (unlike those for durable and semidurable commodities) are based on production data, and are not adjusted to allow for changes in distributive inventories. The reasons for this omission are explained in the text. On the other hand the large excess in the quarterly data for 1934 can hardly be explained by our failure to correct for changes in distributive inventories. Unfortunately no detailed allocation of the difference between the quarterly and annual estimates for that year is possible, since no breakdown of Kuznets' data as between output and inventory change, and as between minor commodity groups, is available after 1933. However, for 1933, the last year for which the breakdown is available,

Footnotes to Table 9 continued on next page.

Footnotes to Table 9, continued.

an excess of \$600 million in the quarterly data—a much smaller excess than in 1934—is attributable almost entirely to disagreement between the annual and quarterly series for paper products. It may well be that the annual data for 1933–35, which Kuznets derives from retail sales, more nearly represent the truth, and that our quarterly series, based (except in the case of drugs) on output data, are out of line. Especially is this possible since the interpolating media for paper products and for gasoline relate to total production, rather than production for ultimate consumption, while the coverage of the Federal Reserve Board index for food products relates only to manufactured foodstuffs. In the absence of any breakdown of the annual totals by commodity groups after 1933, no adjustment of the quarterly to the annual totals was attempted for these years.

^c For 1921–36 the principal data used in the interpolation of consumers' semidurable and durable commodities are as follows: Minor Groups 7 to 13, Dry goods, Clothing, Shoes, Furnishings, etc.—Federal Reserve Board index of department store sales. Minor Group 14, Tires and tubes—domestic shipments of inner tubes and of pneumatic casings, *Survey of Current Business*; Bureau of Labor Statistics wholesale price of tires. Minor Groups 15 to 25, Furniture, Household utensils, Radios, etc.—Federal Reserve Board index of department store sales. Minor Groups 26 to 28, Automobiles, etc.—new passenger car registrations, *Survey of Current Business*; Bureau of Labor Statistics wholesale prices of passenger cars.

For 1936–38 Department of Commerce retail sales data were available.

^d This column corresponds to line B of Table 1.

^e This column corresponds to line A of Table 1. The following items (references to Appendix A, Table 22) were interpolated with the help of material readily accessible in the *Survey of Current Business*: 2 (e) Electric current; 2 (f) Gas, natural and manufactured; 2 (i) Telephones; 5 (a) Bus and street railway fares; 5 (f) Railroad and Pullman fares; 5 (h) Hotels (percentage of rooms occupied together with receipts per occupied room); 5 (i) Foreign travel (United States citizens leaving this country); 6 (a) Postage; 6 (d) Immigrant remittances (foreign money orders issued). The remaining items were graduated by moving cubic.

^f This column corresponds to line C of Table 1.

^g Column 5 adjusted for seasonal variation by mean ratio of moving average to data. Adjustment: 1.045, 1.000, 1.034, .931.

consist largely of rentals, medical expenses and other objects of expenditure which are not, one supposes, subject to violent fluctuation, it seems better to apply a graduation. Accordingly a moving cubic is used in the interpolation of the remaining items.³ The resulting data appear in Table 9; together with the commodity items, they yield quarterly estimates for total consumption. The totals in Table 9 are shown both before and after seasonal adjustment.⁴

³ This method of graduation, which has been adopted as standard in the present study, is described in Appendix G.

⁴ Strictly speaking the consumption totals in Table 9 correspond to the annual data in line A of Table 3. Since it has not been considered worth while to place the adjustment for foreign tourist expenditure in the United States upon a quarterly basis, line A and line C in Table 3 are treated as identical for purposes of interpolation.

§3. *Producers' Durable Goods*

We come now to the components of investment presented in Table 3 above. The interpolation of the annual figures for producers' durable goods rests upon a wide variety of data, some of it for "production," some for "shipments," and some for "new orders." Only the motor vehicle series—based on new commercial registrations—is strictly applicable to the flow of these commodities at the final stage. Investigation of the relationship between these various types of data in different lines of production is sorely needed, and since alternative series are now frequently available in more than one form on what is apparently a comparable basis for the same item, such an inquiry would add considerably to our knowledge. Whether the series presented here for the output of producers' durable goods would show markedly different results if based wholly on shipments data, or wholly on data for new orders, it is impossible to say. For many minor commodity groups there was no choice in the matter, or at best a choice only for recent years. Where an alternative was offered, shipments were preferred to new orders. For we may assume that, while new orders reflect investment decisions, they lack the definiteness of money flows; whereas shipments are presumably related more directly to actual investment outlays, which are what mainly interest us. Such a conclusion might of course be modified after an investigation of the kind suggested.

Appropriate adjustments for transportation charges and distributive margins are not difficult to make. As for changes in distributive inventories, they are not important in this field, as far as one can judge. For this reason they were disregarded, except for motor vehicles in the years before registration data became available, for which years output series had to be used and an inventory correction attempted.

§4. *Construction*

Two methods are available for interpolating the annual estimates of private construction. We may rely on contracts data, or else on data covering the absorption of construction materials. The latter would appear to coincide more closely in point of time with the actual work in progress on a given structure, and with the payments made to contractors in respect of such work. For our purpose, however, data on construction materials suffer from three defects. First, although the output of such materials can be estimated without great difficulty, little if any data are available on the inventory position either of distributors, or of the actual contractors. Second, materials are widely used in maintenance work as well as in new construction, and no segregation seems possible between these two uses. Third, and this is important for the years since 1933, much material is used for public construction, a field with which we are not immediately concerned. While contracts data are by no means all-inclusive, and fail to cover work carried out by firms on their own account, they not only permit a distinction between private and public construction in 1933 and later years, but also exclude maintenance work. These advantages appear to outweigh the disadvantages of contracts data, and our interpolation is accordingly based upon the latter.

The difficulty about the timing of contracts data has been overcome, partially at any rate, by the introduction of a two-month time lag. Thus the contracts reported as let during November, December and January are regarded as relevant to construction during the first quarter of the year, and similarly with succeeding quarters. A lag of this duration was chosen after a careful comparison, month by month, of the timing of contracts let with

the timing of the absorption of construction materials. While such an arrangement is far from perfect, it seems to offer the best procedure available under the circumstances.

§5. *Inventories*

The problem of measuring changes in distributive inventories was mentioned earlier in this chapter. The annual figures in Table 3 and the quarterly series in Tables 10 and 11, are intended, however, to cover not only wholesale and retail distribution but all business enterprises. As such they constitute an important, if not always a deliberate, element in gross and net capital formation.

In deriving the estimates, annual in Table 3 (above) and quarterly in Tables 10 and 11, I have used the same general method and assumptions as are followed in Part VII of *Commodity Flow and Capital Formation*, and most of the basic data have been taken from the same source, or from recent revisions carried out by Moses Abramovitz of the National Bureau of Economic Research. I have to thank both Kuznets and Abramovitz for the use of much unpublished material. The calculations upon which the inventory items in this volume are based will be found in Appendix C, together with a more detailed appraisal of the data than is possible at this point. The measurement of the net change in inventories shown here, and of the inventory profits shown in Chapter V, is probably the most difficult territory in the entire field of estimates, annual or quarterly, treated in this study.

We may recall briefly the methods used by Kuznets for computing the current value of the net change in business inventories. Corporate inventories at year ends are obtained (except for Distribution) from balance sheet material, and raised to account for inventories held by

unincorporated enterprises. Distributive inventories are derived from inventory-sales ratios. The year-end inventories so obtained are converted to 1929 prices by deflation, and the change in constant prices obtained by differencing is revalued group by group on the basis of the average prices prevailing during the year.

The main weakness in this procedure is its initial step, i.e. the deflation of inventories as reported for accounting purposes in order to obtain a measure of their magnitude in 1929 prices. The valuation basis on which inventories are reported in accounting records is known to be somewhat more "conservative" than that of current value; the usual assumption is that the "lower of cost or market" principle affords an appropriate interpretation of accounting practice. Even if we assume that this principle is of sufficiently widespread application for us safely to neglect other methods of inventory valuation, we have still to decide upon the average age of the inventory to be deflated. Moreover, inventories reported for accounting purposes allow of an industrial, but not of a commodity, breakdown: we can know little as to what fraction of the inventory is in a raw state, and what fraction is partly or wholly manufactured.⁵ In addition, the industrial breakdown is somewhat defective. As a result the precise composition of the appropriate price index is subject to doubt. That a considerable margin of uncertainty surrounds inventory calculations, particularly in years of rapid price change, and of rapid inventory accumulation or decumulation, is suggested by the wide variation in results which can be obtained from the use of slightly differing assumptions,⁶ and especially by the difficulty of reconciling physical data for commodity stocks with

⁵ It is understood that a new inquiry, now in progress at the Department of Commerce, will furnish information on this topic.

⁶ See *Commodity Flow and Capital Formation*; also Appendix C to this volume.

estimates of inventories in 1929 prices derived from accounting measures.⁷ Since the inventory change, and not the inventory itself, is the quaesitum, and since it has to be obtained as a residual, one can see quite easily how uncertain these calculations must be. For example, an error as low as 1 percent in an inventory of \$14 billion (manufacturing inventories in 1929 were of this order) leads to an error of \$140 million in the estimated inventory change.

In spite of the gloomy picture unfolded in the above critique, there does not appear at present any way, or even any early hope, of effecting a radical improvement in the procedures outlined. The methods used here for evaluating inventory changes quarter by quarter are therefore substantially the same as those employed by Kuznets in *Commodity Flow and Capital Formation*, Volume I, Part VII. Because of limitations of data, moreover, the quarterly estimates for net changes in inventories, measured in current prices, have been confined to Manufacturing and Distribution. Fortunately these two groups normally account for well over half the inventory change for business as a whole: in only one year of the period (1930) did the annual inventory change for the remaining groups, for which we have no quarterly data, amount to as much as \$1 billion; this figure was actually exceeded in ten years out of eighteen for the two groups mentioned.⁸

The derivation of the quarterly inventory change in current prices, shown in Tables 10 and 11, falls into three parts. For Manufacturing, from 1929 through 1938 the accounting measures of monthly inventories published in index form by the National Industrial Conference

⁷ See Appendix C, §2.

⁸ Data for other groups have been obtained from Kuznets; see below, Appendix C, Table 35.

Board were used to interpolate year-end inventory data due to Moses Abramovitz, and the end-of-quarter inventories so obtained were deflated with the help of price indexes specially constructed by him for the purpose. The quarterly change in 1929 prices was then revalued in current prices by means of the same price series. For 1921 through 1928 year-end inventories in 1929 prices taken from Kuznets were interpolated with data for commodity stocks, and the change was revalued in current prices with the use of appropriate BLS series. For retail distribution year-end inventories on an accounting basis (due to Kuznets) were interpolated with the Federal Reserve Board index of department store stocks, and converted to 1929 prices with the aid of a price index constructed for the purpose. For wholesale distribution the annual change was apportioned quarterly on a rather arbitrary basis.

The calculations and assumptions involved are too complicated to describe in greater detail here, but readers who are interested will find a discussion of them in Appendix C. The annual sums of the quarterly inventory changes shown for Manufacturing and Distribution in Table 10 may be compared with corresponding estimates derived by Kuznets on an annual basis by reference to Table 35 in that Appendix. The agreement is fairly close except for 1930, in which year our data show a large net accumulation of inventories not to be found in the Kuznets figures. The discrepancy in this year is due partly to accumulation in the spring, followed by decumulation later in the year at lower prices, a course of affairs which naturally leads to different results when computation is made quarterly. The best means of obtaining an annual series for all kinds of business appeared to be to combine our own series for Manufacturing and Distribution with Kuznets' annual series for remaining groups; as already

mentioned, the net annual change in inventories in current prices shown in Table 3 has been derived in this way.

The reliability of the quarterly change in inventories in Manufacturing and Distribution, as depicted in Table 10, is somewhat uncertain. It is perhaps interesting nonetheless to observe its behavior in the light of history.⁹ Inventory accumulation during the first half of 1921 was apparently followed by some decumulation, and then by sporadic further accumulation until 1928. From the last quarter of 1928 to the third quarter of 1930 accumulation appears to have been continuous. The data suggest that from the last quarter of 1930 to the middle of 1935 inventories declined almost without interruption, while from the middle of 1935 to the third quarter of 1937 there was again a rapid accumulation, followed by a decline through 1938. Two comments on these movements are pertinent. During recent years the movements seem to have been more sustained, and less frequently reversed, than during the nineteen-twenties; it is possible, however, that this result is due merely to random errors of estimation in early years, errors which disappear through improvement in the data as the period advances. Secondly, while there is considerable evidence of positive correlation with general movements in business, this correlation appears to be subject to a lag several quarters in length. The upward turn in 1921, the downward turn in 1930 and the upward turn in 1935 all took place after—in 1935 two years after—the associated turn in general business. In 1937 on the other hand, the reversal seems to have occurred much more promptly.

⁹ The inventory series, unlike most of the other material in Table 10, has already been adjusted to exclude seasonal variation.

TABLE 10

COMPONENTS OF OUTLAY, BEFORE ADJUSTMENT FOR SEASONAL VARIATION,
QUARTERLY 1921-38^a*Millions of current dollars*

<i>Year and Quarter</i>	<i>Private Outlay</i>						
	Consumers' Outlay (Table 9 column 5) ^b	Producers' Durable Goods ^c	Private Construction ^d	Inventory Change (Table 34) ^e	Foreign balance ^f	Gross Private Investment (2 to 5) ^g	Gross Private Outlay (1 + 6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1921							
i	13,762	1,086	650	1,548	736	4,020	17,782
ii	14,040	859	922	702	210	2,693	16,733
iii	13,429	632	1,224	344	327	2,527	15,955
iv	14,590	675	1,205	-1,126	159	913	15,501
1922							
i	13,067	766	941	922	94	2,723	15,793
ii	14,340	748	1,354	-323	145	1,924	16,264
iii	14,011	926	1,769	-344	54	2,405	16,411
iv	16,621	1,087	1,493	393	216	3,189	19,819
1923							
i	14,899	1,140	1,262	560	-34	2,928	17,825
ii	16,133	1,336	1,829	988	-112	4,041	20,174
iii	15,450	1,283	1,971	1,113	137	4,504	19,958
iv	17,985	1,201	1,659	41	332	3,233	21,211
1924							
i	16,312	1,192	1,600	0	143	2,935	19,242
ii	16,197	1,155	2,107	772	59	4,093	20,298
iii	15,923	1,143	1,955	-62	153	3,189	19,116
iv	18,342	1,182	1,811	-695	512	2,810	21,150
1925							
i	16,708	1,166	1,587	370	181	3,304	20,016
ii	17,439	1,258	2,012	-50	52	3,272	20,711
iii	16,909	1,293	2,315	68	20	3,696	20,601
iv	19,536	1,293	2,422	271	213	4,199	23,734
1926							
i	17,361	1,298	2,052	761	-162	3,949	21,313
ii	18,410	1,378	2,231	105	-21	3,693	22,105
iii	18,011	1,347	2,226	-32	110	3,651	21,663
iv	19,766	1,386	2,307	345	283	4,321	24,082
1927							
i	17,467	1,313	1,915	-254	157	3,131	20,552
ii	18,417	1,379	2,184	-63	61	3,561	21,979
iii	17,443	1,258	2,285	700	27	4,270	21,713
iv	19,585	1,238	2,128	-219	320	3,467	23,001

Public Outlay

Federal Deficit ^b	State and Local Deficit ^c	Increase in Gold Stock ^d	Increase in Silver Stock ^e	Total Public Outlay (8 to 11)	<i>Total Outlay before Depreciation (7 + 12)</i>
(8)	(9)	(10)	(11)	(12)	(13)
-111	331	3	19	242	18,024
63	126	17	19	225	16,958
-261	282	21	15	57	16,013
-215	153	13	13	-36	15,467
-178	317	5	13	157	15,947
-82	106	7	13	44	16,308
-136	253	5	13	135	16,551
-107	116	18	15	42	19,852
-256	275	2	21	42	17,869
-214	65	6	21	-122	20,052
-276	229	3	9	-35	19,919
-114	122	10	4	22	21,240
-410	312	9	3	-86	19,161
-164	127	13	2	-22	20,268
-174	292	10	1	129	19,241
-192	164	8	1	-19	21,133
-208	326	-4	1	115	20,127
-143	112	0	1	-30	20,681
-212	262	1	1	52	20,657
-167	132	5	1	-29	23,706
-324	297	5	1	-21	21,289
-162	90	2	1	-69	22,034
-372	249	8	1	-114	21,548
-213	129	6	1	-77	24,010
-263	304	8	1	50	20,648
-307	106	7	1	-193	21,785
-291	266	14	1	-10	21,703
-223	140	11	1	-71	22,981

TABLE 10 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1928							
i	18,149	1,178	1,743	474	113	3,508	21,657
ii	18,733	1,381	2,112	-817	100	2,776	21,509
iii	18,389	1,467	2,355	-56	65	3,831	22,220
iv	20,605	1,454	2,143	517	511	4,625	25,230
1929							
i	18,734	1,460	1,688	17	252	3,417	22,151
ii	19,463	1,715	1,954	243	-12	3,900	23,363
iii	19,134	1,679	2,329	561	-23	4,546	23,680
iv	20,267	1,599	1,791	682	331	4,403	24,670
1930							
i	17,570	1,457	1,322	750	240	3,769	21,339
ii	18,026	1,440	1,589	812	127	3,968	21,994
iii	16,521	1,250	1,766	715	100	3,831	20,352
iv	17,435	1,008	1,225	-355	257	2,135	19,570
1931							
i	15,221	924	857	-507	146	1,420	16,641
ii	15,230	922	1,073	-2	69	2,062	17,292
iii	14,046	758	1,031	78	-77	1,790	15,836
iv	14,820	682	843	-519	79	1,085	15,905
1932							
i	12,498	553	522	-599	61	537	13,035
ii	12,126	505	481	-242	45	789	12,915
iii	11,335	389	370	-1,194	14	-421	10,914
iv	11,965	385	349	-630	116	220	12,185
1933							
i	10,308	323	234	-191	95	461	10,769
ii	11,831	431	207	-189	40	489	12,320
iii	12,175	569	381	-103	-24	823	12,998
iv	12,624	621	310	-689	182	424	13,048
1934							
i	12,114	643	240	-123	138	898	13,012
ii	12,997	707	286	290	96	1,379	14,376
iii	13,536	710	386	-418	72	750	14,286
iv	14,677	727	312	-392	135	782	15,459
1935							
i	13,078	761	240	2	-1	1,002	14,080
ii	13,831	910	342	-141	-17	1,094	14,923
iii	13,547	959	535	15	-137	1,372	14,919
iv	15,482	1,038	484	343	0	1,865	17,347

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(8)	(9)	(10)	(11)	(12)	(13)
-272	309	1	1	39	21,696
-153	104	8	1	-40	21,469
-181	264	13	0	96	22,316
-117	146	13	0	42	25,272
-231	208	6	0	-17	22,134
-204	206	2	0	4	23,367
-292	296	6	0	10	23,690
-184	187	8	0	11	24,681
-107	290	4	0	187	21,526
-154	164	4	0	14	22,008
-117	267	12	0	162	20,514
-30	123	11	0	104	19,674
321	291	10	0	622	17,263
289	68	7	0	364	17,656
388	237	12	0	637	16,473
633	1	13	0	647	16,552
509	187	8	0	704	13,739
943	8	8	0	959	13,874
682	123	15	0	820	11,734
502	35	11	0	548	12,733
616	104	15	0	735	11,504
802	-132	10	0	680	13,000
238	-9	14	6	249	13,247
888	-301	2	6	595	13,643
1,365	209	86	3	1,663	14,675
1,140	-117	10	3	1,036	15,412
525	115	49	59	748	15,034
919	-28	36	97	1,024	16,483
457	167	43	38	705	14,785
579	-120	32	39	530	15,455
990	86	31	83	1,190	16,109
916	20	41	185	1,162	18,509

TABLE 10 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1936							
i	14,259	1,090	422	139	-95	1,556	15,815
ii	15,378	1,310	605	393	-56	2,252	17,630
iii	15,313	1,425	768	433	-164	2,462	17,775
iv	17,648	1,581	722	937	-13	3,227	20,875
1937							
i	15,265	1,813	706	306	-175	2,650	17,915
ii	16,124	2,165	898	787	-85	3,765	19,889
iii	16,696	1,946	977	1,487	-76	4,334	21,030
iv	18,332	1,453	820	-176	241	2,338	20,670
1938							
i	14,352	1,132	535	-360	241	1,548	15,900
ii	14,749	957	642	-533	245	1,311	16,060
iii	15,007	1,125	853	-555	92	1,515	16,522
iv	17,968	1,106	878	-178	199	2,005	19,973

^a The methods of interpolation adopted (see text) do not allow the quarterly estimates always add up exactly to the annual figures from which they are derived. In consequence slight discrepancies will be observable between this table and Table 3.

In the remaining footnotes to this table, the classification by "Minor Groups" of commodities refers to the scheme adopted in Simon Kuznets, *Commodity Flow and Capital Formation*, Vol. I.

^b This corresponds to line C of Table 1 and line A of Table 3, of which it forms an interpolation. The distinction between total and domestic consumption, made in Table 3, is here disregarded: deduction for foreign tourist expenditure in the United States, as in line B of Table 3, has been considered worth while in the computation of quarterly consumption.

^c This corresponds to line D.1 of Table 3. As in Table 3, output has already been adjusted changes in distributive inventories, so that the figures given here represent as nearly as may be flow of producers' goods to their final purchasers at cost to the latter. The following are the principal data used in the interpolation: Minor Group 32, Industrial machinery and equipment—1921–pumps, steam power and centrifugal, machine tools and woodworking machinery (shipments), *Survey of Current Business*; for construction machinery and mining machinery, the Federal Reserve Board indexes of building contracts and of mineral production were used with what appeared to be appropriate lags; 1934–38, pumps, steam power and centrifugal, machine tools, and air conditioning equipment (new orders), *SCB*; woodworking machinery and foundry equipment (shipments), *SCB*; mechanical stokers (sales), *SCB*. Minor Group 33, Electrical apparatus—1921–27, quarterly output of electrical goods, Bureau of the Census; 1928–38, power switching equipment (new orders), electric motors (shipments), electric furnaces (new orders), power cables (shipments), all *SCB*. Minor Group 34, Farm machinery—1921–33, a graduation was adopted; 1934–38, covered by raising other groups. Minor Groups 35 and 36, Office machinery, etc.—1921–29, same as Minor Group 32; 1934–38, Office furniture, shipments, *SCB*. Minor Group 37, Locomotives and railroad cars—(new orders), *SCB*. Minor Group 38, Ships and boats—ships completed, *SCB*. Minor Group 39, Business motor vehicles—truck production, less exports, corrected for change in dealer stocks (1921–33); new commercial registrations (1934–38), *SCB*; truck prices, Bureau of Labor Statistics. Minor Group 40, Aircraft—aircraft licensed for commercial use, *SCB*. Minor Group 41, Professional and scientific equipment—1921–33, by graduation; 1934–38, by raising other groups. Minor Group 42, Carpenter

(8)	(9)	(10)	(11)	(12)	(13)
340	120	35	89	584	16,399
2,547	-60	-23	38	2,502	20,132
579	43	20	39	681	18,456
860	12	70	38	980	21,855
311	123	-23	25	436	18,351
869	-36	94	23	950	20,839
-171	-19	29	60	-101	20,929
12	-100	18	51	-19	20,651
-119	374	-8	52	299	16,199
412	-191	60	39	320	16,380
228	130	109	32	499	17,021
753	-48	-49	66	722	20,695

d mechanics' tools—same as Minor Group 32. Minor Group 43, Durable containers—steel barrels (shipments), *SCB*. Minor Group 44, Miscellaneous subsidiary equipment—included by appropriate using of the remaining groups.

The quarterly estimates for producers' durable commodities, shown in column 2 of this table, agree very closely with the annual data presented in Table 3, except for the last three years of the period. For 1936 the quarterly estimates run around \$300 million, and for 1937 around \$800 million, above the annual estimates obtained from Kuznets and shown in Table 3. For 1938 the quarterly estimates run about \$500 million below the annual estimates. These discrepancies are distributed fairly uniformly over the minor groups mentioned above, and can be explained either by undercoverage in the 1937 Census of Manufactures (which is unlikely), or on the ground that the cyclical peak in 1937 had for some reason a much greater effect upon our interpolating series than upon the output of equipment as a whole. In view of the uncertainty of its origin, no attempt has been made to eliminate the discrepancy.

^d Residential and business, including farm and privately owned public utility construction. This corresponds to lines D.2 and D.3 of Table 3. Basis of interpolation: 1921-32, Dodge construction contracts, lagged two months; 1933-38, Dodge construction contracts, privately financed, lagged two months. Contracts data are broken down between privately and publicly financed construction only since 1932. Throughout the period, however, the annual data interpolated, though not the interpolating medium, relate to private as distinct from public construction (see note c to Table 3). The lag was adopted in order to show actual expenditure in a given quarter rather than the ultimate result of the investment decisions made in that quarter. As explained in the text, a lag of two months was chosen after comparison of the timing of the contracts data with the timing of the absorption of construction materials. This doubtless seems a rough and ready method of achieving the desired result, but there is no other available at present.

^e Net physical addition to business inventories, valued at current prices. The item corresponds to line D.4 of Table 3, but is unavoidably less comprehensive than, line D.4 of Table 3. Data cover manufacturing and distribution only, and are already adjusted for seasonal variation, being unavailable in unadjusted form. Methods and assumptions involved in the derivation of the series are indicated in the text, and more fully explained in Appendix C.

Footnotes to Table 10, continued.

^f An interpolation of line D.5 of Table 3, by means of export and import statistics, together with quarterly series already developed (see note e to Table 9) for tourist expenditures and noncommercial remittances.

^g This column is an interpolation of line D of Table 3.

^h See line H.1 of Table 3 and note g to that table. Data on an unrevised daily statement basis are available monthly in the *Annual Reports* of the Secretary of the Treasury.

ⁱ For 1929-38, Henry H. Villard, *Deficit Spending and the National Income* (Farrar and Rinehart, 1941), Table 15, p. 293. For 1921-28, a moving cubic graduation of the annual data in line H.2 of Table 3, with seasonal from the Villard data superimposed. See note h to Table 3 and note k to Table 11.

^j *Annual Reports* of the Board of Governors of the Federal Reserve System; see also note i to Table 3.

^k Mint purchases at actual cost: cf. note j to Table 3. From the *Annual Reports* of the Director of the Mint both fiscal and calendar-year data are available for this item, so that approximate half-yearly figures may be obtained without difficulty. From 1921 through the second quarter of 1934 these were graduated, while for the remainder of the period interpolation of the annual data was carried out on the basis of seigniorage reported in the monthly summaries of daily Treasury statements.

§6. *Other Items*

Foreign Balance. To quarterly figures on the value of United States imports (including silver) we added our own data for expenditure abroad by American tourists, and noncommercial remittances to foreign countries, already estimated by quarters in computing column 4 of Table 9. From this total we deducted the value of exports (also including silver) quarter by quarter. The result so obtained differed from the annual data given in Table 3 because of the omission of the balance of ocean freights and other minor current items. The adjustment required on this account was a simple matter, however, and was quite small in size.

Public Outlay. The excess of expenditure over receipts of the Federal government is available monthly on the same basis as that on which it is shown for calendar years in Table 3. The corresponding item for State and local governments has been estimated monthly by Villard for 1929 and later years, but for 1921-28 it was necessary to resort to graduation. As has already been indicated, the absence of quarterly and even of calendar-year data

for the financial operations of political subdivisions of the United States is responsible for one of the most serious gaps in our knowledge. For gold and silver purchases by governmental agencies figures were easily obtained from official sources.

Depreciation. There is no way of placing estimates for depreciation (including depletion of minerals and fire losses) upon a quarterly basis except by resort to graduation. On the other hand there is also no reason to suppose that the short run movements in this item are violent or sporadic, and no serious distortion is likely to result from this procedure. The components of outlay in Table 10 are shown (with one or two exceptions) before adjustment for seasonal variation. Since the quarterly series for depreciation is obtained by graduation, and is therefore free of seasonal movement, it seemed best to reserve this series for insertion in Table 11, where seasonally adjusted data are presented. In order to obtain a figure for net private investment which should be subject to a minimum of weaknesses, the depreciation data have been computed, as in Table 3, upon a current cost rather than an accounting basis.

§7. *Seasonal Variation*

The seasonal movement observable in Tables 9 and 10 is marked, but its significance is somewhat doubtful. Wherever possible seasonally unadjusted data have been used for interpolation. The inventory change shown in column 4 of Table 10 is not available on a seasonally unadjusted basis. Moreover quarterly data for a number of other constituents of the totals in Table 10—for example a major portion of consumers' services—have necessarily been obtained by graduation. Unfortunately it can never be certain whether the seasonal movement,

could we observe it, in items which have been graduated, would accentuate or mitigate the seasonal movement which we actually do observe, for example in Table 10. It is possible that the more or less regular peaks in consumption in the second and fourth quarters of the year, and of construction in the third quarter, are offset as far as concerns total outlay by corresponding declines of a seasonal character in inventories. Nor can we know how the seasonal pattern of consumption itself would be modified, had we been able to include the whole, instead of only a part, of the seasonal variation attributable to services rendered to consumers.

Although the seasonally unadjusted data were thought to be of sufficient interest to be presented separately, their significance is limited. They are in fact, so far as the main object of this study is concerned, merely a step toward seasonally adjusted data, such as are shown in Table 11.

For the most part the seasonal adjustments made in that last column of Table 9 and in the transition from Table 10 to Table 11 are conventional in character, as indeed they are in other parts of this study. The method followed and the adjustment made have frequently been indicated in footnotes. A brief discussion of the general problem of seasonal adjustment, as it affects this investigation, will be found in Appendix G.

§8. *The Outlay Totals*

The quarterly totals for outlay shown in column 11 of Table 11 differ from the annual figures in line I of Table 3, of which they are intended to serve as an interpolation, by as much as \$1 billion (annual sum) in some years. The reasons for this divergence have been set forth already, particularly in the general discussion of

the subject of interpolation in Chapter I, §3. The interpolation of individual items leads to minor discrepancies between the quarterly and annual figures, and these frequently add up to several hundred million dollars in the totals. In addition it must be remembered that the inventory change in Table 11 covers only Manufacturing and Distribution, whereas the corresponding annual item in Table 3 covers the entire economic system.¹⁰ In one year, 1934, the gap between the quarterly and the annual data exceeds \$2 billion, the sum of the four quarterly totals in Table 11 running \$2,700 million ahead of the figure for that year in Table 3. This difference can be traced to a disagreement between the annual and quarterly figures for consumers' perishable commodities, a disagreement which is discussed (but not resolved) in footnote b to Table 9.

Without indulging in elaborate analysis, we may observe briefly the manner in which the various outlay series in Table 11 conform to general movements in business. (The behavior of the inventory series was referred to in §5 above.) Gross investment and its principal components are shown in Chart I and the composition of the outlay totals is indicated in Chart II. In the trough of 1921, consumption turned upward in the fourth quarter, whereas the output of producers' durable goods had already reached its lowest point in the preceding quarter. Private construction seems to have turned even earlier, but the considerable seasonal and other adjustments to which this series is subject make its turning points rather unreliable. The dip in 1924 in the three series mentioned is noticeable, but perhaps slighter than might have been expected; in 1927 producers' durable is the only one of the three to show any decline. In 1929 all

¹⁰ For the discrepancy between annual and quarterly totals due to this cause, see Appendix C, Table 35.

TABLE 11

DERIVATION OF TOTAL OUTLAY, SEASONALLY ADJUSTED, QUARTERLY 1921-

Millions of current dollars

<i>Year and Quarter</i>	<i>Consumers' Outlay (Table 9, column 6)^b</i>	<i>Producers' Durable Goods^c</i>	<i>Private Construction^d</i>	<i>Inventory Change (Table 34)^e</i>	<i>Foreign Balance^f</i>	<i>Gross Privi Investment (2 through</i>
	(1)	(2)	(3)	(4)	(5)	(6)
1921						
i	14,381	1,125	794	1,548	747	4,214
ii	14,040	832	902	702	253	2,689
iii	13,886	629	1,032	344	400	2,405
iv	13,583	684	1,156	-1,126	33	747
1922						
i	13,655	794	1,149	922	105	2,970
ii	14,340	725	1,324	-323	188	1,914
iii	14,487	922	1,491	-344	127	2,196
iv	15,474	1,101	1,432	393	90	3,016
1923						
i	15,569	1,181	1,541	560	-23	3,259
ii	16,133	1,295	1,789	988	-69	4,003
iii	15,975	1,278	1,662	1,113	210	4,263
iv	16,744	1,217	1,591	41	206	3,055
1924						
i	17,046	1,235	1,954	0	154	3,343
ii	16,197	1,119	2,061	772	102	4,054
iii	16,464	1,138	1,648	-62	226	2,950
iv	17,076	1,197	1,737	-695	386	2,625
1925						
i	17,460	1,208	1,938	370	192	3,708
ii	17,439	1,219	1,968	-50	95	3,232
iii	17,484	1,288	1,952	68	93	3,401
iv	18,188	1,310	2,323	271	87	3,991
1926						
i	18,142	1,345	2,505	761	-151	4,460
ii	18,410	1,335	2,182	105	22	3,644
iii	18,623	1,342	1,877	-32	183	3,370
iv	18,402	1,404	2,212	345	157	4,118
1927						
i	18,253	1,360	2,338	-254	168	3,612
ii	18,417	1,336	2,136	-63	104	3,513
iii	18,036	1,253	1,926	700	100	3,979
iv	18,234	1,254	2,041	-219	194	3,270

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<i>Depreciation^b</i>	<i>Net Private Investment (6 - 7)ⁱ</i>	<i>Net Private Outlay (1 + 8)^j</i>	<i>Public Outlay^k</i>	<i>Total Outlay (9 + 10)^l</i>
(7)	(8)	(9)	(10)	(11)
2,151	2,063	16,444	175	16,619
1,996	693	14,733	295	15,028
1,896	509	14,395	29	14,424
1,859	-1,112	12,471	-9	12,462
1,850	1,120	14,775	90	14,865
1,864	50	14,390	114	14,504
1,901	295	14,782	107	14,889
1,955	1,061	16,535	69	16,604
2,015	1,244	16,813	-25	16,788
2,073	1,930	18,063	-53	18,010
2,103	2,160	18,135	-64	18,071
2,105	950	17,694	49	17,743
2,100	1,243	18,289	-153	18,136
2,092	1,962	18,159	47	18,206
2,087	863	17,327	101	17,428
2,089	536	17,612	7	17,619
2,096	1,612	19,072	48	19,120
2,111	1,121	18,560	39	18,599
2,142	1,259	18,743	24	18,767
2,186	1,805	19,993	-2	19,991
2,233	2,227	20,369	-88	20,281
2,276	1,368	19,778	1	19,779
2,299	1,071	19,694	-142	19,552
2,301	1,817	20,219	-50	20,169
2,298	1,314	19,567	-17	19,550
2,294	1,219	19,636	-123	19,513
2,296	1,683	19,719	-38	19,681
2,306	964	19,198	-44	19,154

TABLE 11 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
1928						
i	18,966	1,220	2,128	474	124	3,946
ii	18,733	1,338	2,066	-817	143	2,730
iii	19,014	1,461	1,985	-56	138	3,528
iv	19,183	1,473	2,055	517	385	4,430
1929						
i	19,577	1,513	2,061	17	263	3,854
ii	19,463	1,662	1,911	243	31	3,847
iii	19,785	1,672	1,963	561	50	4,246
iv	18,869	1,620	1,718	682	205	4,225
1930						
i	18,361	1,509	1,614	750	251	4,124
ii	18,026	1,395	1,554	812	170	3,931
iii	17,083	1,245	1,489	715	173	3,622
iv	16,232	1,021	1,175	-355	131	1,972
1931						
i	15,906	957	1,046	-507	157	1,653
ii	15,230	893	1,049	-2	112	2,052
iii	14,524	755	869	78	-4	1,698
iv	13,797	691	808	-519	-47	933
1932						
i	13,060	573	637	-599	72	683
ii	12,126	489	470	-242	88	805
iii	11,720	387	312	-1,194	87	-408
iv	11,139	390	335	-630	-10	85
1933						
i	10,772	335	286	-191	106	536
ii	11,831	418	202	-189	83	514
iii	12,589	567	321	-103	49	834
iv	11,753	629	297	-689	56	293
1934						
i	12,659	666	293	-123	149	985
ii	12,997	685	280	290	139	1,394
iii	13,996	707	325	-418	145	759
iv	13,664	736	299	-392	9	652
1935						
i	13,667	788	293	2	10	1,093
ii	13,831	882	334	-141	26	1,101
iii	14,008	955	451	15	-64	1,357
iv	14,414	1,051	464	343	-126	1,732

QUARTERLY ESTIMATES: OUTLAY

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(7)	(8)	(9)	(10)	(11)
2,321	1,625	20,591	-28	20,563
2,342	388	19,121	30	19,151
2,375	1,153	20,167	68	20,235
2,417	2,013	21,196	69	21,265
2,458	1,396	20,973	-83	20,890
2,491	1,356	20,819	75	20,894
2,499	1,747	21,532	-17	21,515
2,482	1,743	20,612	38	20,650
2,452	1,672	20,033	120	20,153
2,410	1,521	19,547	85	19,632
2,355	1,267	18,350	134	18,484
2,290	-318	15,914	132	16,046
2,219	-566	15,340	555	15,895
2,145	-93	15,137	435	15,572
2,066	-368	14,156	609	14,765
1,987	-1,054	12,743	674	13,417
1,912	-1,229	11,831	654	12,485
1,845	-1,040	11,086	958	12,044
1,791	-2,199	9,521	806	10,327
1,751	-1,666	9,473	614	10,087
1,723	-1,187	9,585	735	10,320
1,708	-1,194	10,637	579	11,216
1,710	-876	11,713	285	11,998
1,728	-1,435	10,318	660	10,978
1,753	-768	11,891	1,663	13,554
1,781	-387	12,610	935	13,545
1,802	-1,043	12,953	784	13,737
1,815	-1,163	12,501	1,089	13,590
1,827	-734	12,933	705	13,638
1,839	-738	13,093	429	13,522
1,852	-495	13,513	1,227	14,740
1,864	-132	14,282	1,227	15,509

TABLE 11 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
1936						
i	14,901	1,129	515	139	-84	1,699
ii	15,378	1,269	592	393	-13	2,241
iii	15,834	1,419	647	433	-91	2,408
iv	16,430	1,602	692	937	-139	3,092
1937						
i	15,952	1,878	862	306	-164	2,882
ii	16,124	2,098	878	787	-42	3,721
iii	17,264	1,938	824	1,487	-3	4,246
iv	17,067	1,472	786	-176	115	2,197
1938						
i	14,998	1,173	653	-360	252	1,718
ii	14,749	927	628	-533	288	1,310
iii	15,517	1,120	719	-555	165	1,449
iv	16,728	1,120	842	-178	73	1,857

^a All items in this table have been adjusted for seasonal variation where necessary. The method of interpolation adopted (see text) do not allow the quarterly estimates always to add up exactly to the annual figures from which they are derived. In consequence slight discrepancies will be observable between this table and Table 3: cf. note b to Table 9 and note c to Table 10.

^b Corresponds to lines C of Table 1 and A of Table 3. See also column 1 of Table 10 from which the figures here given are derived directly. The distinction between total and domestic consumption made in Table 3, is here disregarded; no deduction for foreign tourist expenditure in the United States, as in line B of Table 3, has been considered worth while in the computation of consumer outlay quarterly.

^c Corresponds to line D.1 of Table 3. See also column 2 of Table 10, from which the figures given here are derived directly; the seasonal adjustment is 1.036, .969, .996, 1.013. For data used in the interpolation, see note c to Table 10.

^d Residential and business, including farm and privately owned public utility construction. This corresponds to lines D.2 and D.3 of Table 3. See also column 3 of Table 10, from which the figures given here are derived directly, the seasonal adjustment being 1.221, .978, .843, .959. For method used in the interpolation, see note d to Table 10.

^e Net physical addition to business inventories, valued at current prices. This item, which produces column 4 of Table 10, corresponds to, but is unavoidably less comprehensive than, line I of Table 3. Data cover manufacturing and distribution only. Sources and methods of estimates are discussed in the text, and explained in some detail in Appendix C.

^f Corresponds to line D.5 of Table 3. See also column 5 of Table 10, from which the figures given here are derived directly, the seasonal adjustment being +\$11, +43, +73, -126 million. For methods of interpolation, see note f to Table 10.

(7)	(8)	(9)	(10)	(11)
1,882	-183	14,718	584	15,302
1,906	335	15,713	2,400	18,113
1,945	463	16,297	718	17,015
1,998	1,094	17,524	1,045	18,569
2,053	829	16,781	436	17,217
2,104	1,617	17,741	849	18,590
2,137	2,109	19,373	-65	19,308
2,146	51	17,118	46	17,164
2,148	-430	14,568	299	14,867
2,146	-836	13,913	219	14,132
2,148	-699	14,818	535	15,353
2,157	-300	16,428	787	17,215

^a This series forms an interpolation of line D of Table 3.

^b Includes depreciation on business and residential property; in the case of mining, depletion and development costs charged to current expenses; also marine and fire losses. The item represents depreciation in terms of current prices, rather than as actually charged in terms of book value. It corresponds to line E of Table 3, from which it is derived by moving cubic graduation. Cf. note f Table 3.

^c Net of depreciation. This column corresponds to line F of Table 3, of which it forms an interpolation.

^d Net of depreciation. This column corresponds to line G of Table 3, of which it forms an interpolation.

^e Derived from column 12 of Table 10: for further explanation see notes h, i, j and k to that table, and also accompanying text. Seasonal adjustments were made by mean difference of moving average from data, as follows (references to Table 10):

Column 8: 1921-31, +\$33, -29, +36, -38 million
 1932 +\$50, -100, +50, 0 million
 1933-38, +\$100, -200, +100, 0 million
 Column 9: -\$105, +99, -59, +65 million
 Column 10: +\$5, 0, -5, 0 million
 Column 11: no adjustment necessary

^f Net of depreciation; see column 7. This forms an interpolation of line I of Table 3. The conceptual problems involved in the definition of total outlay are discussed in § 4 of Chapter II.

three series turn down from the third quarter of the year, although it appears that construction may have reached its peak as early as 1926. For total outlay, as for consumption, the third quarter of 1929 represents an all-time high, at any rate in terms of absolute dollar volume. Nor did producers' durable commodities return to the level of that quarter until the first quarter of 1937.

There has been some dispute as to whether the low point of the Great Depression occurred in 1932 or in 1933. It can hardly be hoped that Table 11 will resolve all doubts on this question, although we may note that the three primary series mentioned (consumption, producers' durable goods, and private construction) all turned in 1933—the first two in the first quarter, and the third in the second quarter of that year. On the other hand inventory movements place the low point for investment as a whole in the third quarter of 1932, while the behavior of public outlay fixes the fourth quarter of 1932 as the low point for outlay as a whole.

For the two primary investment series—producers' goods and construction—the downturn in 1937 seems to have occurred during the second quarter of the year, although consumption and inventory accumulation did not begin to decline at least until the third quarter. A marked decline in net public outlay, associated with social security financing, appeared in 1937: we have to go all the way back to 1929 to find a lower level for this series than that which obtained in the third quarter of 1937. The three primary series, and also those for gross and net investment and for total outlay, turned upward one more in the second quarter of 1938. Although the recession of 1937-38 was brief, it was undoubtedly severe—very much more severe, for example, than the recession of 1924 with which it has sometimes been compared. The series most affected was producers' goods, which

from peak to trough—only a year apart—declined 50 percent.¹¹

This brief historical sketch would not be complete without some discussion of the series for net investment which is shown in Table 11 and appears as a constituent of Chart II. These figures have been obtained by deducting depreciation and depletion (in current prices) from gross investment (including allowance for inventory changes), and must be interpreted in the light of the various qualifications mentioned in Chapter II, §4.

No account is taken of investment by governmental agencies. As may be seen from Table 11, the movement of net investment from quarter to quarter is affected considerably by changes in inventories, and may be subject to error on this score. Moreover the general level reported for net investment may well conceal some errors in the data for depreciation as well as for gross investment. For example, net investment as reported was negative from the fourth quarter of 1930 through the first quarter of 1936, and again during the whole of 1938. In other words consumption of capital, so far as concerns the nongovernmental sector of the economy, occurred during 26 of the 36 quarters between the beginning of 1930 and the end of 1938. If depreciation were revised upward by 10 percent, one additional quarter during this period would show negative net investment; an upward revision of 20 percent would yield two additional quarters in which depreciation exceeds gross investment. Downward revisions in the level of depreciation of like amounts would reduce the 26 quarters showing negative net investment to 23 and 20 respectively. As a component of the outlay totals shown in Chart II, net investment can be regarded only as a very

¹¹ There is some reason to believe, however, that the series on which our data for the output of producers' goods are based are unduly sensitive, so that this statement may be an exaggeration. See especially note c to Table 10.

CHART I
GROSS INVESTMENT AND ITS COMPONENTS
 (Seasonally Adjusted)

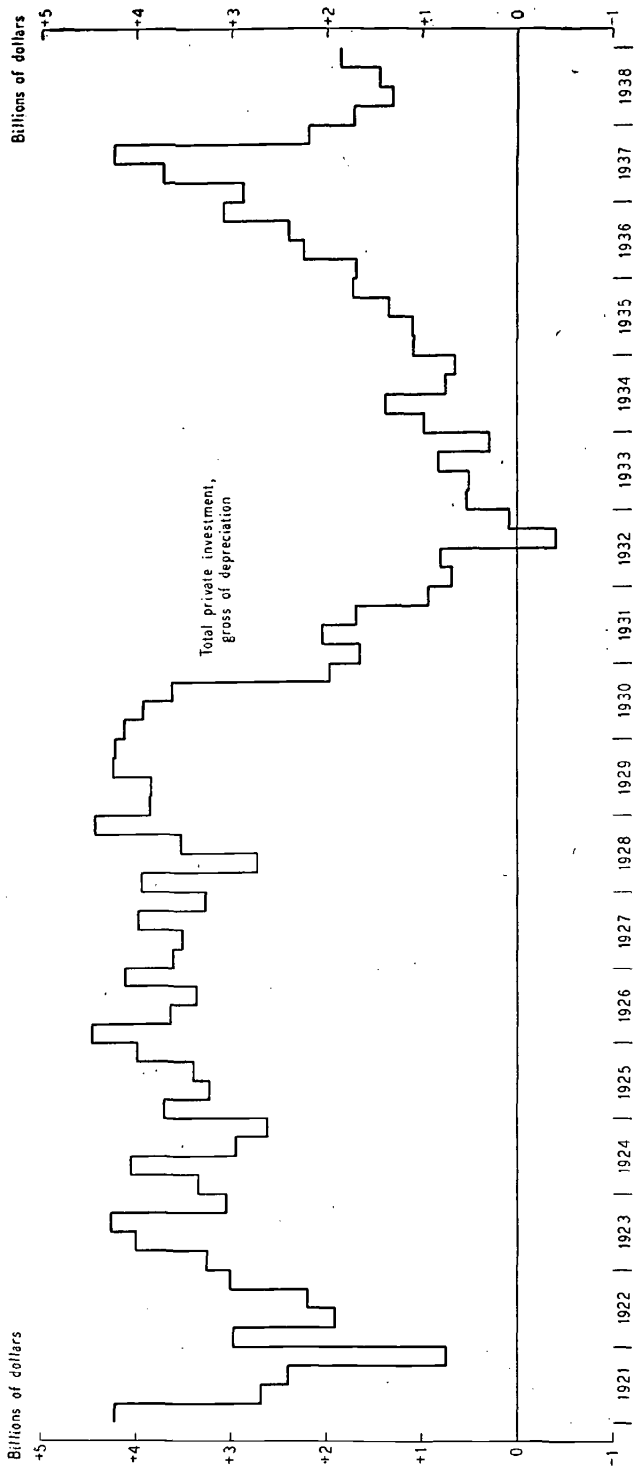
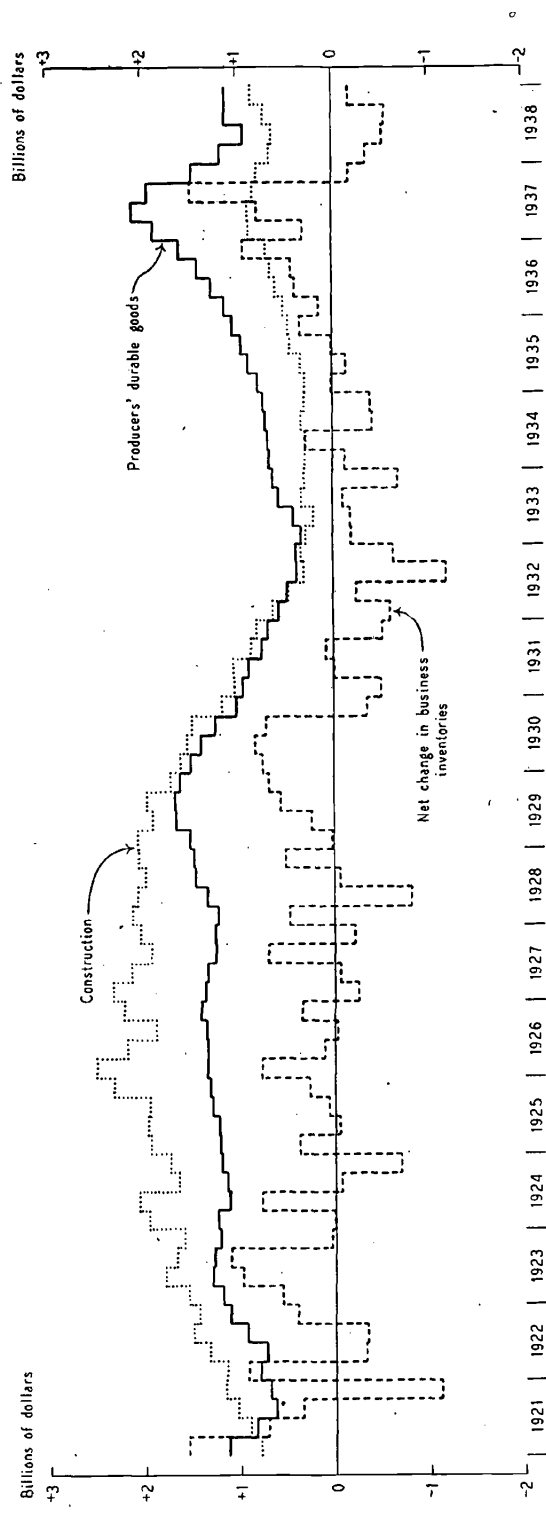
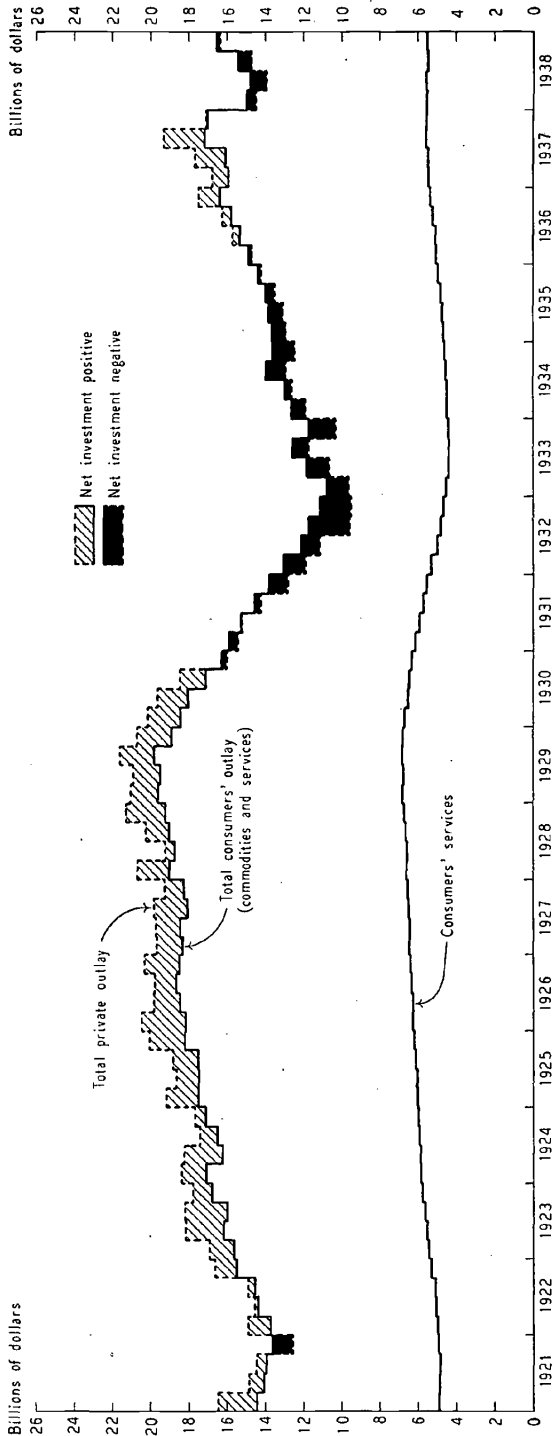


CHART I (continued)
GROSS INVESTMENT AND ITS COMPONENTS
(Seasonally Adjusted)



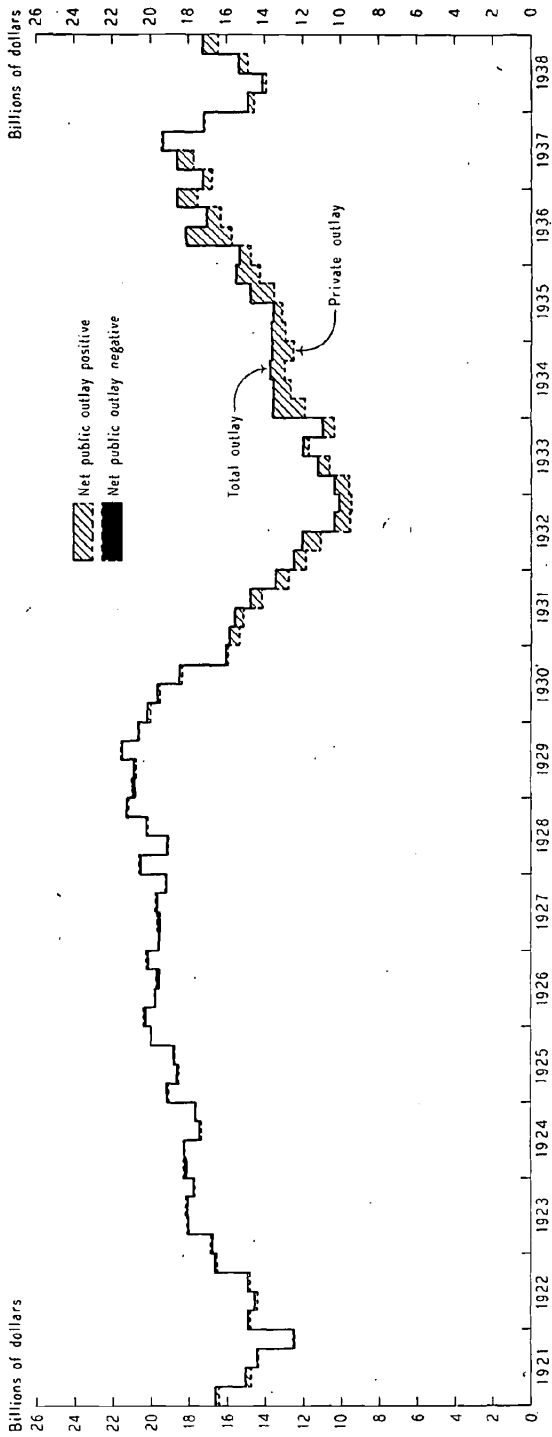
Based on Table 11

CHART II
COMPOSITION OF OUTLAY
(Seasonally Adjusted)



Based on Table 11

CHART II (continued)
COMPOSITION OF OUTLAY
(Seasonally Adjusted)



Based on Table 11

rough measure, in some cases of uncertain sign. The errors introduced into the outlay totals by weaknesses in the series for net investment are, however, relatively much less important.

With this short review we conclude the presentation of the outlay estimates and turn in the next chapter to the derivation of quarterly measures of income.