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APPENDIX A

The National Economy

THIS appendix contains a description of the sources and methods used in estimating the real-output and -input components of the productivity estimates for the national economy and major sectors. Conceptual problems are alluded to where pertinent; they are treated more fully in Part I of the text. The estimates of the chief components and the summary index numbers of the output-input ratios are presented in the tables at the end of this appendix. To some extent, the general methodological description in this appendix is applicable to the industry estimates of productivity as well as to the national estimates and will not be repeated in the subsquent appendixes.

The estimates of aggregate national output and of aggregate capital stocks have been made independently of the corresponding estimates for the several industrial divisions of the economy described in succeeding appendixes because industry estimates are lacking in certain areas. We do, however, compare the aggregate output and capital estimates with the sum of the available industry estimates in order to obtain some idea of their consistency by making explicit the implications for the residual, uncovered area.

In the case of manhours worked, the national estimates were obtained by aggregating the estimates for all the various industry groups of the economy. Here, the question of consistency does not arise. Aggregate manhours do not show the same movement as total "labor input" in the nation, however, since manhours worked in the several industry groups were weighted in accordance with average hourly compensation. A system of occasionally changing weights was consistently applied to both labor and capital inputs and to the real national product estimates before computation of productivity ratios.

Output

Estimates of the national product, adjusted to eliminate the effect of price changes, provide the broadest available measure of the real final output of the national economy. It is this measure, in several variant forms, that we employ as the numerator of the ratios of productivity in the total economy. A weighted average of output index numbers for the several industrial divisions of the economy, as described in succeeding appendixes, is used

for comparison; but it cannot suitably serve as the primary measure Reliable direct estimates for the broad area of finance and services, as well as for several lesser industries, are not available. Moreover, the industry output estimates are generally gross of products purchased from other industries, and therefore do not add up to the national product, except on certain assumptions. Hence, we must rely on the sum-of-final-products approach to the estimation of aggregate national product.

The conceptual differences among the several available sets of product estimates, as prepared by Kuznets and by the Department of Commerce,[1] were discussed in Chapter 2.[2] These differences will be reviewed briefly in subsequent sections as they bear on the methodology of estimation. It may be noted here that we use a recent "statistical variant" of the Kuznets estimates identical with the Commerce estimates for the common components. Thus, the differences among the several versions of the two sets of estimates are wholly due to the somewhat different concepts or the sectoring underlying each.

Before summarizing the methods used to estimate the several versions of national product, the system of weights will be described. The same weighting system has been used for all versions in computing the productivity ratios.

WEIGHTING SYSTEM

Deflation of the national product, by type of expenditure, by index numbers of the market prices of the various final goods and services is, in effect, the same as weighting physical units of the products by base-period market prices. Theoretically, we should prefer factor-cost weights for reasons developed in Chapter 2, but it is unlikely that real product at factor cost would move very differently from real product at market price in the United States economy.[3] In combining industry output indexes, as noted later, we have used the more appropriate value-added or gross factor-cost weights.

Although the comparison base of our constant-dollar estimates and output index numbers is 1929, we have used changing weight bases, as

[1] The Department of Commerce series are described in *National Income Supplement, 1954, Survey of Current Business*; and the recent estimates by Simon Kuznets are described, and references to his earlier works provided, in *Capital in the American Economy: Its Formation and Financing*, in press.

[2] For further literature on concepts, see the references in Chapter 2, note 1.

[3] This judgment is supported by the opinion of two national income specialists, who write: "Although this measure is perhaps conceptually superior as a gauge of the productivity of resources, we believe the practical difficulties associated with a strict application of the factor cost method are so serious that a market price measure is a better 'all purpose' valuation scheme" [Everett E. Hagen and Edward C. Budd, "The Product Side: Some Theoretical Aspects," *A Critique of the United States Income and Product Accounts*, Studies in Income and Wealth, Volume 22, Princeton University Press (for NBER), 1958, p. 243, n. 24].

indicated in Chapters 1 and 2. The price index numbers for the terminal years of each subperiod were averaged and set equal to 100 before deflating values for all years in the subperiods; then the deflated values were chained to the 1929 values to form a continuous series.

It was on this principle that most of the National Bureau estimates of physical volumes of output by industry were prepared (see succeeding appendixes), and the principle is also used in the Federal Reserve index of industrial production. To provide significant comparisons for trend analysis, key years were selected from periods of relatively high business activity. In the case of manufacturing, the years selected by Fabricant were 1899, 1909, 1919, 1929, and 1937; to these we added the business cycle peaks 1948, 1953, and 1957. The index numbers for successive pairs of these key years were cross-weighted by the average unit value added in successive pairs of years, and these were chained to form a continuous series on a 1929 comparison base. Index numbers for intervening census years were weighted by the average unit value of the given year and the succeeding key year. The output indexes for other industries were prepared in similar fashion, although the key years vary slightly depending on the dates of the pertinent industrial censuses.

Since we use the estimates of real private product on the Commerce basis for comparisons with the industry output estimates, and over the subperiods as defined above, we first reweighted the product detail of this series by the average prices in the terminal years of the various subperiods from 1889 to 1953. Since product detail is slender prior to 1889, we have used average prices for 1889 and 1899. For the years since 1953, we have used the 1954 weight-base incorporated in the most recent Commerce estimates.[4]

The reweighting from 1929 forward was carried out on the basis of worksheet detail provided by the National Income Division of the Department of Commerce, which covers several hundred product-classes together with the corresponding price deflators. Prior to 1929, we used the commodity detail given by William H. Shaw,[5] to derive the adjustments necessary to convert the deflators for these segments to a 1929 base,

[4] *U.S. Income and Output, 1958 Supplement, Survey of Current Business.*

Our real-product estimates for 1929–53 are based on the Commerce series published in the *National Income Supplement, 1954*, as revised in subsequent July numbers of the *Survey* through 1957. *U.S. Income and Output, 1958 Supplement* contained further revisions of the national product numbers and associated estimates of persons engaged from 1946 forward, but it was not feasible for us to incorporate the revisions into our basic series through 1953. Fortunately, the revisions were less than 1 per cent in the upward direction for both product and persons engaged; so the derived productivity estimates would not be significantly affected. Our estimates for 1953–57, however, are based on the estimates contained in *U.S. Income and Output, 1958 Supplement.*

[5] *Value of Commodity Output since 1869*, New York (NBER), 1947.

plus a direct conversion of the real-product estimates in the other categories, in order to arrive at aggregate real product on the desired basis of changing weights.

Table A-1 shows changes in the Commerce national product estimates

TABLE A-1

Effect of Alternative Weighting Systems on Subperiod Movements of Real Gross National Product, Commerce Concept, 1889–1953
(per cent)

	Change in Real GNP Weighted by			
	1929 Prices	Changing Prices	1947 Prices	1954 Prices
1889–99	52.4	54.8		
1899–1909	50.4	50.9		
1909–19	32.7	38.2		
1919–29	40.8	40.3		
1929–37	4.5	3.3	2.8	0.9
1937–48	58.6	60.8	58.9	59.7
1948–53	23.7	25.5	25.2	25.9

converted to constant dollars by the single (1929)-base and changing-base weighting schemes just discussed, as well as in 1947 and 1954 dollars as estimated by Commerce for the recent period. Presumably, much the same differences would characterize the Kuznets estimates if they were reweighted correspondingly; and for consistency, we have applied the same reweighting factors to index numbers of the Kuznets estimates in 1929 dollars.

NATIONAL PRODUCT AS ESTIMATED BY KUZNETS

We are fortunate in having the revised estimates of national product by Kuznets on an annual basis back to 1869.[6] These are largely the result of previous work in the field at the National Bureau of Economic Research, summarized by Kuznets in an earlier volume.[7] The new series also draws heavily on the estimates of national product by the Commerce Department for the period since 1929, although the degree of reliability differs in the three statistical variants presented by Kuznets.

The peacetime version: statistical variants. Variant I represents the original estimates presented by Kuznets[8] as later revised to incorporate more recently available data and estimates. These estimates are based on the

[6] *Capital in the American Economy.*
[7] *National Product since 1869*, New York (NBER), 1946.
[8] *National Income and Its Composition, 1919–1938*, New York (NBER), 1941.

income payments approach, with consumer expenditures for services derived as a residual. The various components of product were extrapolated from the late 1930's by Commerce estimates of the corresponding components. The estimates under Variant II are the same as those under Variant I, except that direct estimates of service expenditures are substituted for those obtained as a residual, thus introducing a "statistical discrepancy" between the Kuznets income and product estimates (which are equal in the first variant). In Variant III, Kuznets uses the Department's estimates, adapted to his conceptual framework, for the years since 1929, and extrapolates back the various components by the corresponding components of Variant I, except for services, which are extrapolated by the direct estimates used in Variant II.

It should be emphasized that the three recent variants prepared by Kuznets are purely *statistical* variants and that they all embody the same basic concept of national product. In each, national product is taken as the flow of goods to consumers and into capital formation; government purchases are included only to the extent that they are interpreted as falling into one or the other of these categories of final product. In this study, we make use of Kuznets' Variant III only (see Table A-I). Statistically, this variant is practically identical with the common components of the Commerce series. We can thus focus attention on the conceptual basis of different trends in output and productivity using the two basic alternative series. Kuznets has stated that "there are no compelling reasons for preferring any one of the three variants in the study of long-term trends: they yield almost identical results."[9] In view of this fact, there is no reason to complicate the picture by dealing with more than one of the Kuznets sets of national product estimates, although we do present several *conceptual* variants of both the Kuznets and the Commerce product series.

The national security version. In his book, *National Product in Wartime*,[10] Kuznets developed supplementary estimates of the national product for the years of the two world wars, based on the assumption of two end purposes of a nation's economic life. In addition to the peacetime goal of satisfaction of the wants of individual consumers, he maintained that in wartime the preservation of the nation also becomes a prime purpose of economic activity, ". . . and war output is properly treated as a final product." In *National Product since 1869*, he presented revised annual estimates of national product from 1919 through 1943 on the basis of both the "peacetime" and "wartime" concepts. His most recent estimates, however, are presented only in terms of the peacetime concept, which he has consistently maintained is appropriate for long-term comparisons.

[9] *Capital in the American Economy*, Vol. II, p. B-18.
[10] New York (NBER), 1945.

As an alternative basis for productivity comparisons, in Table A-I we reintroduce estimates that are basically adjustments of the recent Kuznets product estimates to the wartime concept. In this, we follow Frederick C. Mills.[11] As developed earlier, the rationale for this procedure lies in the argument that in a world of national states, national security is *at all times* a prime social objective. On these grounds, we have shifted from the term "wartime" to the more general term "national security," which accords with the designation by Commerce of the relevant government outlays.

In order to estimate the national security version, one must first deduct outlays for durable war goods from the Kuznets peacetime estimates and then add total national security outlays, which include durable war equipment and new construction. Estimates of government purchases of durable war goods—munitions and new construction—consistent with the revised aggregates are contained in Kuznets' *Capital in the American Economy*.[12]

Kuznets also presents a supplemental series showing "gross war output," 1914–53.[13] In assembling this series, he uses the Commerce estimates of national security purchases for the years available—1939 forward. The estimates for earlier years are derived as described in *National Product since 1869*, Table I-9. We have likewise used the Commerce estimates of national security purchases from 1939 on. We have made several adjustments, based on his worksheet detail, to the Kuznets estimates in order to achieve more precise comparability with the Commerce estimates of total federal government purchases and the national security component for later years. Specifically, we have deducted foreign loans and added back payments of principal and interest on such loans. These adjustments are of some importance from 1917 to 1933. We have also added back sales of war supplies, since the Commerce procedure is to deduct total government sales of goods from total purchases rather than to allocate this item by type of purchase. We thus have a series that may be related to the government-purchases component of the Commerce national product estimates as well as used to build up the national security variant of the Kuznets product estimates. For the years before 1914, we have based our estimates of federal military (War and Navy Departments) expenditures on those presented by M. Slade Kendrick.[14] These estimates have been converted from fiscal years to calendar years by use of the factors described below in the explanation of the total federal-purchases estimates.

[11] *Productivity and Economic Progress*, Occasional Paper 38, New York (NBER), 1952, Note 1.

[12] Vol. II, Table 7.

[13] *Ibid.*, Table 6.

[14] *A Century and a Half of Federal Expenditures*, Occasional Paper 48, New York (NBER), 1955, Table B-1.

Deflation of national security purchases was accomplished with a view to maintaining consistency with the relevant constant-price estimates of both Kuznets and Commerce. The current-dollar estimates were first broken down into four components: government purchases of durable war goods, as estimated by Kuznets; pay of the armed forces (including value of subsistence and clothing provision), estimated as described in Appendix K; pay of civilian employees of the Defense Department (formerly War and Navy Departments), estimated as the product of the number employed[15] and the average annual compensation of federal civilian general-government employees, as described in Appendix K; and an "all other" residual, which includes nondurable munitions. The fact that the "all other" estimates are low and relatively stable in peacetime years gives some support to the validity of the total security estimates and their breakdown, although the detail is used primarily for deflation purposes.

The constant-dollar estimates for the first three components were derived as described in the sources cited for the current value series. Thus, we use the Kuznets figures for munitions and war construction in real terms; and the base-period pay of the armed forces and of civilian employees of the Defense Department is extrapolated by employment, consistent with the Commerce estimates of real government purchases. The deflator for all other purchases is the same general price index used for total "all other" federal-government purchases, as described below, through 1940. From 1941 to date, however, with a much more substantial volume of other purchases due to the increased amount of nondurable munitions procurement, we have combined the "all other" price deflator with the price deflator used by the Commerce Department for munitions. Kuznets also used the Commerce munitions deflator for durable munitions outlays since 1939. But since the deflator is composed of price series for both durable and nondurable munitions, by weighting it into the deflator for residual purchases including nondurable munitions we obtain constant-dollar totals for the broader category of munitions plus other war purchases that are similar to those contained in the Commerce figures.

Capital consumption and net product. The recent estimates by Kuznets of capital consumption and net national product in 1929 dollars, adjusted to eliminate his allowance for real depreciation on munitions, are shown in Table A-I. The adjustment was made for the sake of consistency with our input estimates since we do not include durable munitions as part of the stock and input of productive capital.

Kuznets' capital consumption figures were generally derived from his estimates of fixed capital formation in constant dollars, depreciated in

[15] Solomon Fabricant, *The Trend of Government Activity in the United States since 1900*, New York (NBER), 1952, Tables B-6 and B-7.

accordance with estimated life spans of major classes of producer goods. Possible errors of estimate can arise as a result of errors in the capital formation estimates, the lengths of economic life employed, the assumption of a constant length of life, and the time-shape of the depreciation charge. It is Kuznets' judgment, however, that the deduction of capital consumption as estimated from gross national product for the purpose of trend analysis "yields a smaller error than no adjustment."[16] Between the years 1880 and 1922, Kuznets finds considerable agreement between the sum of his real net capital formation estimates and the change in real wealth, estimated independently.[17]

It is important to understand that the real capital consumption estimates do not purport to measure the volume of capital goods production necessary to maintain intact the productive capacity of the economy. Rather, they should be interpreted as measuring the resources required to maintain the income-producing ability of the capital stock in terms of base-period prices. A given amount of capital goods in constant prices, whether for expansion or for replacement, would be expected to have a greater output capacity in one period than in another as a result of technological advance. It is this concept of capital that accords with the requirements of productivity analysis.

NATIONAL PRODUCT ON THE COMMERCE BASIS

The Commerce Department has published estimates of the gross national product in constant dollars as well as at current market prices for the years since 1929. We converted these estimates through 1953 to a 1929 base (accepting the Kuznets estimates in 1929 dollars that were based on the Commerce estimates and shifting the deflator for the remaining components) before reweighting as described earlier. In order to obtain estimates on the Commerce conceptual basis prior to 1929, the Kuznets Variant III estimates of the components that were consistent with the Commerce framework were used, independent estimates being made of the components that had to be added to the adjusted Kuznets figures to arrive at totals on the Commerce basis.

Specifically, this means that implicit government services to consumers had to be estimated and subtracted from Kuznets' flow of goods to consumers, and "services furnished without payment by financial intermediaries other than life insurance companies" added; public capital formation and the net change in stocks of monetary metals had to be subtracted from Kuznets' total capital formation; and, most important, total government purchases of goods and services had to be estimated and added to the estimates of private purchases of goods and services.

[16] *National Product in Wartime*, p. 20.
[17] See *Capital in the American Economy*.

The following sections describe the methods used to estimate the reconciliation items in current and 1929 dollars prior to 1929. Table A-IIa contains estimates in 1929 dollars for the entire period through 1957, since the Commerce estimates on a 1929 price base are not published elsewhere. In presenting these figures we accept the conversion by Kuznets of the Commerce estimates from a 1947 to a 1929 price base, although it should be noted that the conversion was done on the basis of broad product groupings rather than in the full product detail in which the Commerce current value estimates were made. Table A-IIb contains annual estimates in current values for 1929 and earlier years only, as the estimates for later years are readily available from Department of Commerce publications—although estimates for selected key years of more recent periods are provided as a further guide to those who wish to make their own reconciliation between the Kuznets and Commerce series.

Private purchases of goods and services. Two adjustments are necessary to go from Kuznets' "flow of goods to consumers" to the Commerce "consumption expenditures" estimates. The first is the deduction of government direct services to consumers, which Kuznets roughly approximated in current values by the use of estimates of personal tax and nontax payments for the years through 1940; for 1941 and subsequent years, because of the effect of war and national security requirements on personal taxes, he applied the 1929–40 ratio (0.036) of personal taxes to consumption expenditures (excluding unpaid financial services) to these expenditures in the later years. The price index applied is the implicit deflator for total consumer expenditures for services.

For 1929 to 1890, we have estimated personal tax and nontax payments independently since they are not shown explicitly in Kuznets' series. Federal income tax liabilities of individuals for the calendar years 1913–29 were estimated from the *Annual Report of the Commissioner of Internal Revenue.* Fiscal-year totals for the estate and gift taxes were taken from the *Annual Report of the Secretary of the Treasury* and were averaged to obtain calendar-year receipts. The sum of these two series was used to extrapolate back the 1929 Commerce estimate of federal personal tax payments. The relatively small amount of nontax payments was extrapolated by civilian population figures.

State personal tax receipts back to 1915 were estimated annually on the basis of data collected by the Governments Division of the Bureau of the Census. Certain categories were split between personal taxes and indirect business taxes on the same basis as that used by the National Income Division. Census figures were also available for 1890, 1902, and 1913. Estimates for intervening years were obtained by straight-line interpolation, and the entire series was adjusted to the Commerce level in 1929. Personal tax receipts of local government units were extrapolated by property tax

revenues for 1927, 1922, 1913, 1902, and 1890, as reported in the Census Bureau special studies of state and local government finances (see note 25.) Annual interpolations to 1902 were made on the basis of property tax revenues in cities of over 30,000 population; from 1902 to 1890 the interpolation was on a straight-line basis. The special-assessment portion of nontax payments was also estimated on the basis of reports on this item by cities of over 30,000 population. The residual nontax payments were handled in the same manner as federal nontax payments.

Because of the lack prior to 1890 of aggregate data on state and local tax receipts, which loomed much larger than federal at that time, we have resorted to the device used by Kuznets after 1940. For 1889 and earlier years, the value of imputed direct services by governments to consumers was held at a constant ratio to the value of the flow of other consumer goods. The ratio used was 0.015, slightly below the 1890 ratio of personal tax and nontax payments to consumer outlays. This ratio was used in preference to a ratio based on several years of experience, since there was some upward drift after 1890.

Our estimates of personal tax and nontax payments are the same as those included in the Kuznets aggregate estimates from 1929 forward, since both are based on the Commerce series. From 1919 to 1929, our estimates differ slightly from those shown by Kuznets,[18] but our figures are consistent with both the later and the earlier estimates. It should be noted that the consistency of our series with the Kuznets estimates of the flow of goods to consumers cannot be precisely determined. They are consistent to the extent that the ratios of services to commodities, by which Kuznets built up his totals, take account of the trend in tax receipts revealed by direct estimate.[19]

Kuznets is aware that his method of imputing a value to the direct services to individuals by governments is a rough convention, tolerable only because the magnitudes involved have been small until recent years. His preferred method, given sufficient resources, would be to make a functional classification of all government outlays and segregate the magnitudes representing final services, such as health, education, recreation, and the like. Judging from the occasional attempts at a specific approach, with due allowance for interpretation of the dividing line between direct and cost services, Kuznets does not consider the results of his convention to be unreasonable for the 1929–38 decade. Furthermore, as Table A-2 shows, the portion of government purchases (excluding war output and new construction) assumed to represent final purchases has fluctuated between the 0.3 and 0.5 ratios indicated for 1939 and 1929, respectively. The ratio of final government services to national product

[18] *National Product since 1869*, Table 1 4B.
[19] Cf. *ibid.*, Part III.

has tended to rise over the long run, but this is a reflection of the expanding role of government in the economy rather than the result of an assumption that government has devoted an increasing share of its services to the ultimate consumer.

The other item necessary to reconcile the Kuznets and Commerce consumption expenditure estimates is "services furnished without payment by financial intermediaries except insurance companies." This item, not included by Kuznets, represents the imputed value of banking services furnished to individuals without charge. The current values are approximated by the operating expense of banks, which is equivalent to their property income less interest payments to customers by type. In translating this item into real terms, we have used the Commerce procedure and assumed that the flow of real services is proportionate to the dollar volume of deposits of individuals, adjusted for changes in the purchasing power of the dollar by the consumer price index.

TABLE A-2

Government Services to Consumers in Relation to Net National Product and Total Government Outlays, Key Years, 1870–1953

	NET NATIONAL PRODUCT, KUZNETS	GOVERNMENT OUTLAYS[a]	IMPUTED DIRECT GOVERNMENT SERVICES		
			Value	*Proportion of*	
				Net National Product	Government Outlays
	(billions of dollars)			(per cent)	
1870	5.49	0.23	0.07	1.3	30
1890	11.45	0.48	0.15	1.3	31
1910	28.97	1.3	0.44	1.5	34
1929	90.3	5.2	2.6	2.9	50
1939	73.8	8.4	2.4	3.3	29
1948	192.8	15.9	6.3	3.3	40
1953	258.8	23.1	8.2	3.2	35

[a] Exclusive of outlays for national security and new construction.

We have also used the Commerce approach in extending the estimates to earlier years. The current value estimate in 1929 was extrapolated by the estimated gross earnings of all banks in the United States. This was obtained by blowing up the gross earnings of national banks by the ratio of total deposits in all banks to those in national banks.[20] The constant-dollar estimates were extrapolated by the total deposits of all banks, which were deflated by the consumer price index of the Bureau of Labor Statistics (shifted to a 1929 base and extrapolated for years prior to 1913

[20] *Historical Statistics of the United States, 1789–1945*, Dept. of Commerce, 1949, Series N 61, N 26, and N 34.

by the index prepared by the Federal Reserve Bank of New York).[21] It should be noted that this procedure involves the assumption that the portion of bank deposits held by individuals as consumers did not change significantly prior to 1929.

Despite the roughness of the estimating procedure, the results seem reasonable. The imputed services of financial intermediaries rise from about 0.5 per cent of consumption expenditures in 1870 to 1.5 per cent in 1929. Because the value of these services is consistently below the imputed value of direct government services, the Kuznets estimates of consumer goods are slightly higher than those on the Commerce basis. Since the absolute increases (but not the percentage increases) in government services exceed those in financial services, the Kuznets estimates of consumer goods show a slightly higher rate of growth over the period as a whole than those based on the Commerce concept.

In the field of fixed investments, the necessary adjustments are simple. As we later add total government purchases, here we deduct public purchases of durable equipment (including munitions) and new public construction from the Kuznets estimates. Because of his estimating procedure, Kuznets' estimates of the flow of durable equipment include not only government purchases, but also a small statistical discrepancy as compared with the Commerce estimates. Since we extrapolate the latter estimates back of 1929 by the Kuznets estimates exclusive of munitions, we are in effect holding the small amount of nonwar equipment purchased by the government plus whatever statistical discrepancy remains at its 1929 ratio to the total Kuznets estimates of nonwar equipment purchases.

The only difference between the Kuznets and Commerce estimates of the change in business inventories is that the former include the net change in inventories of monetary metals. The figures shown in Table A-II are the Kuznets estimates exclusive of his explicit estimates of the value of the change in monetary metal stocks from 1919 forward. The latter series is not shown here, but can be obtained as the difference between these figures and those published by Kuznets. The monetary metal item is generally quite small. Prior to 1919, Kuznets did not explicitly estimate this item; indeed, his estimates of the change in business inventories were based on an extrapolation of the regression of total inventories on commodity flow since 1919. We have taken his estimates of inventory change prior to 1919 without adjustment as being essentially comparable with the later Commerce figures. Because of the large margins of error attaching to the inventory change estimates in the early period, a minor adjustment would be meaningless.

Kuznets' estimates of "net changes in claims against foreign countries" in current values are identical with the Commerce estimates of "net

[21] *Ibid.*, Series L 36.

foreign investment" since 1929 and are conceptually comparable with the latter in the earlier years. A difference exists, however, between the two sets of estimates in constant dollars. Commerce deflated exports and imports of goods and services (receipts and payments) separately by the price indexes applicable to each. Kuznets, on the other hand, deflated the *net* balance by a general price index (the implicit deflator for the rest of national product). The Commerce method can be justified from a production standpoint, while the Kuznets method conforms to a welfare approach, since changes in the terms of trade between the United States and the rest of the world affect the real income of the nation.[22] The results of the two methodologies can be significantly different, particularly from year to year, as a result of divergent movements between export and import prices and shifts in the composition of trade.

In view of the generally small magnitude of the balance and the deterioration of the quantity and quality of data necessary to implement the Commerce approach in the earlier period, we have used the Kuznets constant-dollar estimates for the years prior to 1929.

Federal government purchases. Having derived estimates of private purchases of final goods and services on the Commerce basis, the remaining task was to estimate total government purchases of goods and services. This was a major endeavor, and we will describe the sources and methods separately for federal and for state and local government purchases.

It was possible to estimate total federal purchases annually from 1869 to 1929 by essentially the same methods as those used by the Commerce Department for more recent years. The basic source was the *Annual Report of the Secretary of the Treasury*, supplemented for 1921–29 by Budget documents. The point of departure was the series on total ordinary administrative budget expenditures. These data were adjusted to a "purchases" basis by deduction or addition of the various items described generally in the *National Income Supplement, 1954*, pp. 146–47. The resulting estimates, which relate to fiscal years, were than converted to a calendar-year basis.

The expenditures data, as transcribed, were already net of debt retirement and premiums. The major nonpurchase items deducted were, in the earlier years, pensions and interest on the public debt. Of much smaller magnitude were District of Columbia expenditures, grants-in-aid, tax refunds, budgetary expenditures relating to government enterprises, and purchases of existing assets. Grants-in-aid to state and local governments were not a significant deduction until World War I. The government-enterprise item was confined to the Post Office in the nineteenth century;

[22] A discussion of this point is contained in a paper by Solomon Fabricant, "Capital Consumption and Net Capital Formation," *A Critique of the United States Income and Product Accounts*, Studies in Income and Wealth, Volume 22, p. 440.

but various other enterprises growing out of the war and its aftermath required substantial adjustments from 1917 on—as did loans and purchases of foreign obligations, and capital formation of government enterprises. The deduction for government sales, necessary to arrive at net purchases, was of some consequence throughout the period.

Adjustment of the estimates from a fiscal- to a calendar-year basis was somewhat rough because only gross-expenditure data were available by months in the *Annual Report of the Secretary of the Treasury*. The proportions of fiscal-year expenditures falling in each half-year period were computed, and these proportions applied to the fiscal-year purchases estimates. Somewhat more than half the expenditures tended to fall in the first six months of the fiscal year. The half-year purchases figures were recombined to yield calendar-year totals.

For purposes of deflating the current value estimates, federal government purchases were split into three broad categories: labor compensation, new construction, and other purchases of goods and services. The method of estimating compensation of general-government employees is described in Appendix K. Since the compensation in constant dollars was extrapolated by the employment estimates, the implicit deflator was the average annual compensation per employee.

The estimates of federal government new construction from 1929 to 1915 are those published by the Department of Commerce.[23] The deflator was derived from the same source by allocating the constant-dollar estimates for the various types of public construction between federal and state and local governments by the same proportions as those applied to the current values, and then dividing the constant into the current values. The current-dollar values, by major types, were extrapolated back to 1869 on the basis of the estimates reproduced in *Historical Statistics*, Series H 27–32. The deflator was extrapolated from 1915 back by that used by Kuznets for total new public construction.

Other federal government purchases in current dollars were derived as a residual. The deflator for this component, used by the Commerce Department since 1929, consists broadly of components of the Bureau of Labor Statistics wholesale price index, reweighted in accordance with the relative importance of the various types of purchases in 1938 as revealed by detailed estimates assembled by the Temporary National Economic Committee. Since federal agencies purchase such a wide variety of goods, the implicit deflator so derived moves closely with the composite wholesale price index excluding agricultural products, and with the food component reduced in weight to 2 per cent of the total, in line with its relatively small importance in federal agency procurement. This somewhat modified

[23] *Construction Volume and Costs, 1915–52*, May 1953 Statistical Supplement, *Construction and Building Materials*.

composite wholesale price index was used to extend the Commerce deflator from 1929 back. Prior to 1890, the BLS wholesale price composite was extrapolated to 1869 by a weighted average of wholesale prices for the various product groups contained in the Aldrich Report, including farm products.[24] The weights were those underlying the BLS index for 1909, except for the smaller weight assigned the food group.

State and local government purchases. The estimates of purchases of state and local governments are not quite so reliable as those of the federal government, particularly with regard to annual changes; but the indicated trends should be relatively accurate at least as far back as 1890. Estimates of state and local government expenditures have been prepared by the Governments Division of the Bureau of the Census for 1890, 1902, 1913, 1922, 1927, 1932, and thereafter biennially.[25]

The census estimates represent direct general expenditures on a consolidated basis net of most intergovernmental transactions. To convert these to a purchases basis, it was necessary to deduct interest on general debt and purchases of existing assets, and to add capital outlays of state and local government enterprises (utilities and liquor stores). The interest item is shown in the cited studies. Purchases of land and existing assets were estimated to be one-third of the estimate shown for these items plus new equipment, the proportion being based on that in later years when separate estimates were available for existing and new assets. Enterprise capital outlays were estimated by applying to total capital outlays the ratios of enterprise expenditures to total expenditures.

The Census Bureau estimates relate to fiscal years ending in the calendar years indicated, except for 1913 when all data were adjusted to a fiscal year ending June 30. Apparently, in the years with which we are concerned, most local governments (nonschool) and many state governments operated on a calendar-year basis. Accordingly, in the years other than 1913 we have adjusted only the estimates of school expenditures by adding one-half the difference between expenditures for the school year ending in the given calendar year and those in the succeeding school year to the former. In 1913, the same type of adjustment was made to total state and local expenditures. Even in 1913, the adjustment amounted to only about 3 per cent of the fiscal-year purchases.

Annual interpolations of state and local government purchases were made between the benchmark years from 1902 to 1927, and between the

[24] *Wholesale Prices, Wages, and Transportation*, Committee on Finance, Senate Report No. 1394, 52d Cong., 2d sess., 1893.

[25] *Historical Review of State and Local Government Finances*, Special Studies No. 25, 1948; and *Historical Statistics on State and Local Government Finances, 1902–1953*, Special Studies No. 38, 1955. The estimates for 1922 and 1927 were based on less-than-complete coverage of all government units, but the available data were blown up to approximately full coverage by the Census Bureau.

adjusted Census estimate for 1927 and the Commerce estimate for 1929 on the basis of partial annual data collected by the Census Bureau. From 1915 to 1929, the data relate to expenditures of state governments and of cities of over 30,000 population. Prior to 1915, only municipal government data were available for annual interpolations. For a few scattered years, data were not collected; these cases were handled by straight-line interpolation in constant dollars, with reflation of the interpolated estimates. The derivation of annual estimates prior to 1902 will be described following a summary description of the deflation procedures.

Deflation was carried out in terms of three major components. Estimates of the compensation of state and local school and nonschool employees, the first component, were available in current and constant dollars annually back to 1869, based on methods described in Appendix K. Estimates of new construction, the second component, were obtained by subtracting federal government new construction (see preceding section) from the estimates of total new public construction prepared by Kuznets, in both current and constant dollars. The residual "other" purchases by state and local governments in current dollars for 1890, 1902, and subsequent years were than deflated. The deflator was the Commerce series extrapolated by the wholesale price index excluding food and farm products (described in the preceding section), weighted 0.82, and the index of wholesale food prices, weighted 0.18. The relative weights are those employed in the Commerce deflator.

Annual estimates of other purchases prior to 1902 were prepared in the following way. A straight-line interpolation between the 1890 and 1902 constant-dollar residual purchases was made; the resulting annual estimates were then reflated by the price deflator in order to obtain current-dollar figures. The estimates for residual purchases, in current and constant dollars, were then added to the corresponding estimates of employee compensation and new construction in order to obtain total state and local purchases for the intervening years. Estimates of other purchases for the years prior to 1890 were obtained first in constant dollars by extrapolating the 1890–1953 trend in this item on a per capita basis, and applying the extrapolated figures to population estimates for the earlier years. The constant-dollar estimates so derived were then reflated by the price index to obtain current-dollar figures. Total state and local purchases were then obtained as the sum of the three components, in current and in constant dollars.

Since one of the components was derived by extrapolation prior to the 1890 benchmark, the earlier estimates are clearly less reliable than those for 1890 and subsequent years. Other purchases, in real terms per capita, have shown a remarkably steady growth since 1890, however; and it does not seem unreasonable to assume a similar trend in earlier decades, since forces such as urbanization were at play throughout the entire period.

VARIANT FORMS OF THE COMMERCE ESTIMATES

Table A-III contains several variant forms of real product on the Commerce basis. Only one of these, the gross "domestic product," represents a competing aggregate concept, covering as it does the product of factors located in the national geographical area as contrasted with the "national product" of factor services provided by residents of the area. The net national product estimates are designed to portray final product after allowance for capital consumption as defined by Commerce. The estimates of gross private domestic product represent a different level of aggregation with respect to industry coverage—the product of government factors is excluded in order to give a better basis for productivity comparisons in view of the Commerce method of estimating real government product. This variant is shown on a domestic basis, gross of capital consumption, for greater comparability with the output of the various private-industry groups.

Net national product. The Commerce estimates of capital consumption have a somewhat narrower coverage than those of Kuznets described earlier. They do not include depletion "since the value of the corresponding discoveries of natural resources is not an element of capital formation or profits."[26] Neither do they include depreciation on publicly owned capital goods, presumably because this procedure is not followed in public accounting.

In order to obtain estimates of capital consumption in constant dollars on the Commerce basis, we have subtracted the depletion and public depreciation components from the Kuznets totals in 1929 dollars. This was done for the years after 1929 as well as for prior years, since Commerce has not yet published estimates of capital consumption in constant dollars. The resulting aggregates comprise depreciation on private stocks of fixed capital (including owner-occupied residences), capital outlays charged to current expense, and accidental damage to fixed capital. While having the same coverage as the Commerce estimates, the constant-dollar aggregates do not necessarily embody the same accounting conventions pertaining to lengths of life and methods of charging depreciation as those underlying the Commerce estimates unadjusted for price changes. The nonfarm depreciation portions of the latter estimates are in terms of original cost, as contrasted with the Kuznets estimates in current, replacement values. This does not concern us in general, since our focus is on physical-volume series; it does explain, however, why the estimate of capital consumption for 1929 in Table A-III deviates somewhat from the one published by Commerce.

[26] *National Income Supplement, 1954*, p. 42.

As a rough check on the comparability of the capital consumption estimates on the Commerce basis derived from Kuznets, and the Commerce estimates since 1929, we have deflated the latter by appropriate price indexes drawn largely from the work of Raymond Goldsmith. Although the movements of the two series are quite close, we have used the adjusted Kuznets estimates of capital consumption in deriving net national product on the Commerce basis. This not only provides consistency throughout the long period, but also conforms to our objective of minimizing the purely statistical differences between the Kuznets and Commerce series.

Domestic product. Both Commerce and Kuznets define national product in terms of the output attributable to the factors of production supplied by residents of the continental United States. Thus, the income from capital invested in foreign countries by United States residents is added to income and product, while the income accruing to residents of foreign countries from their capital investment here is deducted. Kuznets deflates the current-dollar "net payments of factor income from abroad"[27] by the general national product deflator, and an analogous general price index is used by Commerce.

If the net payments are deducted from national product, or not included to begin with, the corresponding aggregate is called the "domestic product." By this concept, the criterion for inclusion in income or product becomes the physical location of the factors themselves. Thus, the return to capital owned abroad but located in this country is included, while the income from capital located abroad but owned by United States residents is not added. From a strict welfare viewpoint, the national concept seems appropriate, since we are concerned with the real income that the residents of a nation derive from productive activity. Real national income or product differs from the output of goods and services within the country (deducting purchases from abroad) to the extent of net factor payments from abroad.

As indicated in Table A-III, net factor income from abroad is a small item, fluctuating between −0.5 per cent of national product in the late nineteenth century and +0.5 per cent in recent years. Yet, for purposes of productivity comparisons, except when these are related to real-income comparisons with welfare connotations, as in Chapter 4, there are advantages in using the domestic product concept. Estimates of net investments abroad, which must be included in input on a nationality basis, are subject to greater margins of error than domestic capital stock estimates. Furthermore, the flow of real income from foreign-owned capital bears an erratic

[27] The estimates from 1929 forward are given in *National Income Supplement, 1954*, Table 11, p. 174; those for earlier years are described in Kuznets, *Capital in the American Economy*, Vol. II, pp. A-41 and B-30 to B-32.

relationship to the output of the industries concerned and to the capital stock itself; this association tends to distort the capital and total factor output-input ratios. Finally, if aggregate productivity is to be compared with productivity in various industries, the aggregate should be on a domestic basis, since the industry input estimates are available only on this basis.

Private domestic product. Because of the difficulties of measuring real government product, it is desirable to exclude the government sector and study productivity movements in the private domestic sector. National income and product originating in general government is defined by Commerce as the compensation of the productive factors employed by government units. In practice, Commerce counts only the compensation of general-government employees, although it can be argued that an imputed return to publicly owned capital stocks should also be included (see Appendix K). But in either case, the product of the private domestic economy (which includes government enterprise) is obtained by deducting government product from total domestic product. In Table A-III, estimates of private product are shown gross of capital consumption, since we later compare them with industry output estimates that are on a gross basis; but net private product can easily be computed from the information provided.

COMPARISON OF REAL PRODUCT WITH AN AGGREGATE OF INDUSTRY OUTPUT

The comparisons in this section are intended primarily to give some indication of the consistency, since 1889, between total real gross product originating and the output measures for the several industrial divisions of the private domestic economy. The comparison is also a rough external check on the reliability of the real-product estimates, subject to qualifications noted below.

There is actually no objective way of assessing the margins of error in the real-product estimates. On the basis of a critical examination of source materials, the Commerce Department technicians tentatively concluded "that the estimated annual totals of gross national product, national income, and personal income are subject to only a small percentage of error."[28] This statement applies only to the estimates since 1929, and it is generally accepted that the quality deteriorates as the estimates are extended backward. The product estimates for 1869–79 are notably weak because of deficiencies in the Census of 1870, a fact that is confirmed by the analysis of this section. It is for this reason that we begin our annual real-product estimates with 1889 and have recourse to annual averages for the two earlier decades.

[28] *National Income Supplement, 1954*, p. 66.

The process of price deflation was carried out in terms of more than 200 product classes after 1929, using the wide variety of sources available. For the earlier period, fewer price series were available, and the deflation was done on a more aggregate basis. Thus, the real-product as well as the current value estimates are presumably less accurate in the early period, although the "physical-volume" figures are subject to various qualifications throughout, as noted in Chapter 2. Nevertheless, the fact that the productivity estimates from 1889 on show a comparatively regular movement over the subperiods and appear generally plausible is some indication of the broad reliability or at least the consistency of both the real-product and the input estimates.

It is only for the period since 1929 that an appraisal of the real-product estimates could be made on the basis of an aggregate of output measures for all industry segments. Even for this period, the industry aggregate is not perfectly adapted for our purposes. Only in the farm, construction, and finance and services areas are the measures true net output or "real product originating" measures. The other industry estimates are gross of intermediate products consumed in the production process and therefore are fully comparable conceptually with aggregate real product only on the assumption that the real gross and net output measures have moved proportionately. In a number of segments, it was necessary to apply "coverage adjustments" to the extent that the value of the physical units underlying the industry composite fell short of the total value of production.[29] The coverage adjustments are not generally large; but, insofar as the underlying assumption that either unit value or productivity in the uncovered areas moved with the like variable in the covered industries is not valid, some distortion may be introduced. Further, in the construction and the finance and services areas, current-dollar gross national product originating was deflated directly by product price indexes. This procedure introduces possible distortions in the results, apart from shortcomings in the deflators (see Appendixes E and J). It is implicitly assumed that average prices of intermediate products move with average prices of gross output. Since the intermediate-product ratio is not large in the finance and service areas, distortions from this source should be minor.

To obtain the aggregate industry output index, gross national income originating in the various segments in 1929 was extrapolated by the output indexes shown in Table A-IV. Correspondingly, the real gross product index was based on the fixed-weight 1929-dollar estimates of Table A-III. From the comparison of aggregate industry output with real product (Table A-IV) for the years since 1929, it is apparent that real product rose somewhat more over the period as a whole, and in two of the three subperiods. The evidence is summarized in Table A-3.

[29] See Appendix D for discussion of coverage adjustments.

The divergence between the two measures over the whole period is not unreasonable in view of differences in their construction. In the first place, the ratio of net to gross output has probably increased over the period under review, except in the extractive industries. A larger increase in real product than in gross output results from savings in materials and greater processing per unit. This was true in manufacturing since 1939,[30] and in the earlier decade it was probably also the case in electric and gas utilities with respect to the major intermediate input, coal.[31]

TABLE A-3

Private Domestic Economy: Comparison of Movements in Real Gross Product and Aggregate Industry Output, Subperiods, 1929–53
(link relatives)

	Aggregate Industry Output	Real Gross Product	Ratio: Gross Product to Industry Output
1929–37	97.8	102.5	104.8
1937–48	164.7	159.8	97.0
1948–53	121.8	122.5	100.6
1929–53	196.3	200.7	102.2

Secondly, insofar as there is a trend towards higher-priced grades of products as real income grows secularly, physical-volume indexes tend to have a downward bias. That is, if the basic units used for composite physical-volume measures are heterogeneous, the indexes do not show shifts among grades as changes in volume. Deflated value estimates do, of course, reflect such shifts. Finally, the coverage adjustments may not adequately reflect the growing output of new products whose prices are falling relative to average prices.

Thus, it seems reasonable that the gross output aggregate should rise less than real product. The reversal of this tendency in the 1937–48 subperiod may well be associated with the effects of postwar reconversion, which were still in evidence in 1948. The results of this comparison are, of course, no proof of the accuracy of the real-product estimates. Possibly the divergence between the two aggegates should be greater. And since the series in question are based on many of the same sources, they may have either errors in common or errors peculiar to each that work in the

[30] See *Trends in Output per Man-hour and Man-hours per Unit of Output—Manufacturing, 1939–53*, BLS Report No. 100, 1955.

[31] See Jacob M. Gould, *Output and Productivity in the Electric and Gas Utilities, 1899–1942*, New York (NBER), 1946, pp. 172–83.

same direction. But, at least, the two series appear to be relatively consistent, when account is taken of the conceptual and methodological differences between them.

The appraisal of the real-product estimates prior to 1929 must be made on a different basis. Estimates of national income or product originating in finance and services are not available for the earlier period; neither are estimates of physical output. Real gross income originating in the finance and services segment can be derived as a residual, however, by the subtraction of covered real gross income from total real gross income of the private domestic economy. The relevant indexes are shown in Table A-IV. The same qualifications apply to this comparison as were mentioned in connection with the post-1929 comparisons. For example, insofar as the ratio of nonfarm net to gross output has increased, the growth of real product in the finance and services segment would tend to be overstated in the residual measure.

The implied growth of output in the finance and services areas prior to 1929 was much greater than that shown by the direct measure after that date. But when compared with labor input, the average annual rate of increase in the partial productivity ratio was 1.5 per cent for 1889–1929 compared with 1.6 per cent for 1929–53. Although somewhat irregular over the subperiods, the indicated trends in finance and services output per unit of labor input do not appear to be prima facie evidence of distortion in the trend of the total real-output measure.

Prior to 1889, the movement of output per unit of labor input for finance and services throws considerable doubt on the validity of the aggregate measure. A large increase between 1869 and 1879 is followed by a decline between 1879 and 1889. These gyrations certainly confirm Kuznets' opinion that real product in 1869 is understated, possibly by 10 per cent or so, partly because of the well-known undercoverage of the Census of 1870. The 1879 aggregate, on the other hand, may possibly be overstated. It was partly because of the behavior of the residual real-product estimates that we decided not to show annual estimates for the aggregates prior to 1889. The decade averages do, however, yield productivity results that are more in line with later experience.

Labor Input

Based on the concepts developed in Chapter 2, labor input has been estimated by weighting manhours worked in the various industrial divisions of the economy by average hourly compensation in each. All classes of workers are included in the estimates of persons engaged, manhours, and labor input: proprietors and the self-employed, unpaid family workers, and employees of all categories including nonproduction as well as production workers. The labor variables were estimated by industrial

segment and then aggregated to obtain economy totals. Thus, the problem of consistency between the aggregates and the industry components does not arise as it does in the cases of output and capital. We shall, however, compare our aggregates with estimates based on other sources.

The sources and methods used in deriving the labor series for the various industry segments are described fully in succeeding appendixes; only a summary description is given in this section. Weighting procedures, however, are fully explained. Annual estimates of employment and manhours are presented for broad sectors. The distribution by industry is shown only for key years; but the reader can compute the numbers in greater detail for all years from the industry appendix tables. Annual index numbers of labor input are shown in the productivity summary tables for the national economy and the private domestic sector at the end of this Appendix.

EMPLOYMENT

Our chief interest in employment is as a means of obtaining estimates of manhours and labor input for the productivity ratios. Where direct manhour data are available, employment figures are used to derive estimates of average hours worked. They are also of interest as a measure of resource allocation as analyzed in Chapter 7. Consequently, estimates of employment as well as of manhours and labor input are presented in the appendix tables.

Employment concepts. The employment estimates used in this study are based on establishment reports, or they represent extrapolations of establishment-based employment estimates. Establishment reports are collected in connection with industrial censuses or Census surveys, social security and similar administrative programs, and Labor Department and trade-association reporting programs. In this type of report, all workers employed in a given time period are counted, including part-time workers whose primary employment is in another establishment in the same or a different industry, and workers who have shifted jobs during the period. In contrast, in reports prepared by the Census Bureau from decennial population censuses or current population surveys of the labor force, each worker is counted only once, in the industry in which he is primarily employed. This is the major difference between the two estimates. However, the Census estimates also tend to be lower, since a minimum age limit is invoked (fourteen years since 1930; ten years before then). Even today, particularly in agriculture, many children under fourteen and even under ten years of age are employed (usually as unpaid family workers) for parts of the year.

A substantial portion of the difference between establishment and labor-force reporting disappears when numbers of employees are

converted to a "full-time equivalent" basis. The distribution of employment among industries differs, however, to the extent that part-time work performed elsewhere by primary workers of a given industry is not precisely offset by part-time work performed in the given industry by outside workers. The employment estimates shown in this report are generally approximations to full-time equivalents, since this provides a better basis for analyzing the industrial distribution of manpower by giving a more comparable content to the average job in each industry. Manhours actually worked is, of course, an even better basis for such an investigation.

As will be seen from the comparison in Table A-VIII, estimates of employment on a labor-force basis and of persons engaged on an establishment basis (which comprise full-time equivalent employees plus proprietors and unpaid family workers) do not precisely coincide as to level and and movement. This is largely because proprietors and unpaid family workers have not been reduced to a full-time equivalent basis. About 5 per cent of this class of worker are multiple job-holders. To the extent that they are employees in a secondary activity, they serve to swell the establishment employee count but not the labor force enumeration. However, the estimates of establishment employment even on a full-time equivalent basis are swollen relative to Census employment estimates to the extent that outside employment lifts a person's workweek above the prevailing average.

The labor force estimates suffer from the disadvantage that population censuses are taken less frequently than industrial censuses and surveys. Also, prior to the 1950 Census, the labor force estimates were not broken down by industrial attachment. Although industry estimates have been built up from occupational detail, a considerable margin of error is involved because of the problem of allocating "repeater" occupations. Further, derivation of employment estimates from the labor force figures by deducting unemployment estimates is somewhat hazardous, particularly on an industry basis. Since 1940, we have had monthly Census population surveys of both the labor force and employment; but since these are based on a small sample they are subject to considerable sampling variability, particularly with respect to the unpublished industry detail.

For the purpose of combining employment with average hours estimates in order to obtain manhours, full- and part-time employment estimates are frequently appropriate. Much of the material on hours relates to averages based on both full-time and part-time employees of establishments; therefore, our worksheets contain industrial employment estimates on both bases. Estimates of full- and part-time employment for the aggregate are shown in Table A-V.

Finally, something should be said as to the temporal dimensions of employment averages. Employment is usually reported as the total number

of persons on the payroll during a specified period of time—frequently, one week in each month. Annual averages are thus averages of temporal samples. To the extent that these samples are not representative of the whole period under review, the annual average is not entirely "true." The same observation holds for average hours estimates. Some of the estimates of persons engaged, particularly proprietors, relate to even fewer periods in the year, or possibly to only one date. In such cases, it is evident that seasonal and cyclical fluctuations affect the adequacy of the estimates as annual averages. This is more serious with respect to annual changes than to trends.

Ideally, we should like to have a daily count of all persons at work in establishments or self-employed for days in which operations are conducted. Then the tally could be averaged for all operational days per year to arrive at average annual employment. If daily hours actually worked by the persons engaged were also tabulated, then average hours worked per day, or per year, could be computed. Even such an "ideal" setup would have its problems. Days when operations were significantly below normal would pull down the averages, which would then not reflect average employment under full operating conditions. Similarly, average annual hours would not reflect the average work-year of fully employed workers to the extent that layoffs occur. Total manhours worked would, however, be obtained; and this is the prime desideratum for productivity estimates. Averages of employment and hours are inevitably subject to problems of interpretation of the sort indicated. Manhours, which refer to totals rather than averages, are less ambiguous, although the problem of errors resulting from temporal sampling remains. The statistical problem of measuring manhours worked as distinct from manhours paid for will be treated later.

Sources and methods. The estimates of persons engaged used in this study are drawn for the most part from secondary sources. For 1929 and subsequent years we have used, with a few exceptions, the estimates of the National Income Division of the Department of Commerce, which have been carefully prepared and are consistent with the estimates of national income and product.[32] The Commerce estimates for agriculture, mining, manufacturing, much of transportation, communications and public utilities, and government, have been extrapolated back by estimates based on establishment reports in census years, and by other government surveys or trade-association data. Many of these estimates are contained in previous National Bureau studies of output and employment, extended for the present study by the use of parallel sources and methods. Employment

[32] *National Income Supplement, 1954*, and *Technical Notes, Sources and Methods Used in the Derivation of National Income Statistics*, National Income Divsion, Office of Business Economics, mimeo, 1948. See Chapter 2 for discussion of the importance of consistency with national product.

in the other areas of the economy was extrapolated back of 1929 largely by Daniel Carson's estimates [33] of gainful workers in the various industry divisions, based on *Census of Population* occupational data; Carson's figures were adjusted for changes in the ratio of employment to the labor force as estimated for the total economy by Clarence D. Long. [34] In a few service segments, employment estimates made by Stanley Lebergott for the years back to 1900 were used, since his series appeared to be the most carefully prepared of those that were available.[35] Lebergott also made heavy use of the census data on gainful workers by occupation.

The estimates for 1929 and subsequent years, and particularly those since 1939, are considerably more reliable than the earlier figures. This statement is more applicable to the industry distribution than to the aggregate, and to year-to-year changes than to trends.

Since 1939, the Commerce employment estimates have been based on Social Security and Railroad Retirement data, which cover almost four-fifths of all workers. Another 15 per cent or so of the workers are government employees, for whom relatively reliable estimates are made, based on data gathered by the Civil Service Commission and the State and Local Government Division of the Census Bureau. Since complete coverage is thus obtained for almost 95 per cent of employees, and estimates for many of the uncovered industries derive from relatively reliable sources, the quality of the employment estimates is very good. The quality of the estimates for persons engaged, which include proprietors and the self-employed, is not so good, because before and after 1950 interpolations and extrapolations for nonfarm proprietors were based largely on estimates of numbers of firms derived from sample surveys. Also, we added the estimates of unpaid nonfarm family workers, based on the Census Bureau's current population survey, back to 1941. These are subject to considerable sampling variability at the half-million level involved in this category in 1941.

From 1929 to 1939, the estimates are also quite firmly based. Occasional censuses were taken, beginning in 1929, of most major industrial divisions. Annual movements, frequently based on the BLS employment estimates derived from establishment surveys, are less reliable than the indicated longer-term trends.

Prior to 1929, industrial censuses were not taken for trade, services, and construction. In these areas, chief reliance has been placed on the decennial occupation data. In order to obtain annual estimates for the

[33] "Changes in the Industrial Composition of Manpower since the Civil War," *Studies in Income and Wealth, Volume 11*, New York (NBER), 1949.

[34] *The Labor Force under Changing Income and Employment*, Princeton University Press (for NBER), 1958.

[35] *Estimates of the Labor Force, Employment, and Unemployment, 1900–1950*, Office of Statistical Standards Bureau of the Budget.

economy, employment in a few industrial divisions has been interpolated between census years on the basis of the relationship to output. Clearly, annual productivity comparisons are meaningless for an industry for which the estimates are thus derived. In such cases, comparisons have been confined to decennial years or averages.

Even in the areas in which industrial censuses were taken periodically, annual interpolations were generally based on samples or partial state data; so the year-to-year movements are less significant than changes between census years.

Characteristics of the estimates. Since the estimates for earlier years have been used to extrapolate the worker estimates of the Commerce Department, they are thereby adjusted to establishment-count levels, even when the extrapolator is an adjusted population-count series. The Commerce Department publishes two different sets of employee estimates: full-time equivalents and full- and part-time employment. The full-time equivalent employee is not defined in terms of a set number of hours per week, but rather in the approximate terms of the prevailing workweek. In practice, Commerce has made the conversion by dividing payrolls of part-time employees by the average pay of full-time employees on the basis of segregated payroll data that were available from some of the industry censuses and from Social Security data. Therefore, short-period changes in the relationship between the two series prior to 1940 are not significant since the ratio of one to another was determined by the benchmark information for selected years. Even with constant industry ratios, however, the ratio of full- and part-time employees to full-time equivalents in the economy as a whole is affected by interindustry shifts of employment. Part-time employment is significantly large only in certain industrial segments, such as trade and services. In other segments, such as manufacturing, it is so small a portion of the total that actual employment is used to approximate full-time equivalent employment.

In estimating employment prior to 1929, we have extended both full-time equivalent and full- and part-time employment by the same series in each of the industries. This implies that the proportion between the two in each of the segments remained constant at the 1929 ratio. Thus, changes in the ratios at the national level prior to 1929 reflect only interindustry employment shifts. Table A-V shows the two series for selected years throughout the period.

Numbers of proprietors (including self-employed) have generally been estimated directly, as indicated in the succeeding appendixes. Estimates of nonfarm unpaid family workers, however, were available only for 1941 and subsequent years. These estimates, based on the Current Population Surveys, cover the nonfarm economy as a whole and were distributed by industry in proportion to the number of proprietors. Prior to 1941, unpaid

family workers were extrapolated back by the numbers of proprietors, using the 1941 proportion. This is obviously a crude expedient, but as of 1941 only 0.5 million persons were involved, and total employment including even these rough estimates should be better than estimates not allowing for the unpaid. Numbers of unpaid family workers are greater in agriculture than in the rest of the economy; and the farm employment estimates of the Department of Agriculture include this class of worker, although they are not separated from proprietors.

Table A-V also shows the numbers of proprietors and unpaid family workers and their importance relative to total persons engaged. The total from 1929 forward differs from the Commerce Department estimates in two respects: (1) the Department of Agriculture series on farm employment has been substituted for that used by the Commerce Department (the former includes unpaid family workers and is estimated somewhat differently); (2) we have added estimates of unpaid nonfarm family workers not covered by Commerce.

Annual estimates of employment in the national economy by major sector are given in Table A-VI. The industrial distribution of the estimates of total persons engaged is shown for key years in Table A-VII. As indicated earlier, employees are on a full-time equivalent basis, family workers are not. Proprietors are included if they work more than half-time in their establishments, and unpaid family workers, if they work fifteen hours or more. Since 5 per cent of family workers on farms and almost 4 per cent of nonfarm family workers have secondary jobs (in 1950),[36] there obviously could be some distortion in the industrial distribution presented.

Comparison with the Census estimates. In Table A-VIII, our estimates of total persons engaged are compared with estimates based on population census data, prepared by Long[37] for census years 1890–1950, extrapolated to 1870. Although estimates based on establishment reports can be expected to differ from those based on the population censuses for reasons cited earlier, it would be disturbing if the movements of the two series were widely different. The labor-force estimates are tied into relatively reliable population figures, and the levels and movements of labor-force participation ratios by age-sex classes have been relatively persistent. Considerable confidence can therefore be placed in the trends revealed by the labor-force estimates, despite the need for assorted adjustments at various dates, as described in some detail by Long. The adjustment necessary to derive an employment figure is subject to a considerable margin of error, but the unemployment ratio is generally so small that

[36] "Multiple Employment and Pay Status of Persons with Job but not at Work, July 1950," *Current Population Reports*, Series P-50, No. 30., Dept. of Commerce, 1951.
[37] *Op. cit.*, Table C-1.

inaccuracy here should not seriously affect the indicated employment trends.

The comparison indicates that the broad movements of the two sets of estimates are reasonably consonant. The series used in this study, however, is largely independent of the labor-force estimates only since 1929. In earlier years, estimates for industries accounting for more than half the total number of persons engaged have been tied into the Census figures. Despite this fact, the ratios of our estimates to those of Long show a small upward drift, amounting to about 4 per cent over the eighty-year span.

This could be due to the fact that prior to 1929 we assumed that full-time equivalent employment moved with full- and part-time employment within the industrial segments for which independent data were available. Part-time work may well have increased over the period as a result of the declining length of the workweek, which permitted more secondary (part-time) job-holding, and the increasing labor-force participation of women, to some degree on a part-time basis. The rise in the ratio of the industry employment aggregate to the census-based estimate in 1940 may be due to an inadequate adjustment of full- and part-time employment to a full-time equivalent basis, but between 1930 and 1950 the two series show almost precisely the same changes.

The long-term difference between the two series is not large enough to warrant adjustment of the industry aggregate, even if the census-based employment series could be taken as perfectly accurate. Apart from the adjustments required in the labor-force data, there are possibilities of error in the employment ratios.

AVERAGE HOURS AND MANHOURS WORKED

In general, estimates of manhours worked in the economy were obtained by multiplying employment by average hours worked per year in the various industrial groupings.[38] Various sources of data and types of average hours series were used for the several industries. These are described in some detail in the succeeding industry appendixes. Here we shall summarize briefly the chief sources used and the major qualifications attaching to the aggregate average hours and manhour estimates.

It has only been since 1940 that comprehensive average hours estimates for the economy have been collected in the current population surveys of the Census Bureau (*Monthly Report on the Labor Force*), and these have been based on a relatively small sample of households.[39] Because we were

[38] In steam railroads back to 1916 and farming back to 1910, direct estimates of manhours were available. In these cases, average hours worked were obtained as the quotient of manhours and employment.

[39] For 1940, an industrial distribution of employment by average hours classes for the week of March 24–30 is available in the *Census of Population, 1940.*

interested in average hours and manhours by industry group consistent with total economy estimates, as well as in continuity, we continued to build up economy manhours estimates by industry despite the availability of a comprehensive series after 1940. Census Bureau average hours estimates (provided from unpublished tabulations) were useful, however, in filling gaps in the finance and services areas.

Sources and methods. For federal government classified and "blue collar" civilian employees, information concerning the standard workday, workweek, and holiday and leave provisions was contained in records of the Civil Service Commission. Special studies gave some indication of leave actually taken so average hours worked per year could be estimated. No similar information was available for the armed services; indeed, the meaningfulness of an hours measure of input is questionable for this category. But to maintain consistency in the measure of labor input throughout the economy, average hours worked by federal civilian employees were imputed to members of the armed services. At the state and local level, information concerning the average workday of persons engaged in public education was obtained and multiplied by the average number of days worked per year; the latter is available annually from the Office of Education. There is no central source of information on average hours worked by nonschool employees, but the occupations included in this category are so diverse that average hours worked in the rest of the nonfarm economy were used. This was the broadest imputation required in the manhour estimates.

For the private farm economy, direct estimates of average hours worked are available from the *Monthly Report on the Labor Force*, and these were used beginning with 1950. The Department of Agriculture has made annual estimates of farm manhour requirements back to 1910, based on periodic technical studies. With minor adjustments, these seemed appropriate to our purposes. When divided by the farm employment estimates, the implicit average hours worked per year showed little trend. This relative stability can be rationalized (see Appendix B), and we assumed a constant average in years prior to 1910.

It is in the private nonfarm sector that the widest variety of sources was used. The broadest coverage of average hours is provided by the BLS, which has published estimates over a varying number of years for manufacturing, mining, contract construction, trade, communications and public utilities, and a few service industries. The manufacturing series begins in 1909, but most of the others begin in the 1930's.

The BLS bases its average hours estimates on data, collected from a sample of establishments in each industry, relating to average full- and part-time employment and the corresponding manhours paid for. The manhours estimates cannot be used as such since they are based on a sample;

but the average hours estimates derived therefrom may be multiplied by full- and part-time employment estimates for the several industries as a whole in order to obtain total manhours. The use of sample information implies that both the level and the movement of the average hours series is subject to some error. Because the BLS employs a "cutoff" sample and not a probability design, the sampling variability of the estimates cannot be calculated. The samples used are relatively large, however, particularly for manufacturing, and have been broadened on several occasions. The BLS schedules cover production and related workers in the manufacturing and mining segments, and nonsupervisory workers in the other industries. Hours paid for but not worked are carried at the level prevailing for employees actually at work in the reporting establishments.

The average hours estimates based on BLS or other establishment reports,[40] and extrapolations of these series, have been multiplied by the average number of full- and part-time employees in the several industries, and then by 52 to obtain manhours per year. To the extent that average hours of salaried or supervisory employees were not covered, it was assumed that they were the same as the average hours of the covered workers—an assumption which is probably more valid with regard to trends than to short-term fluctuations. In those industries in which proprietors and unpaid family workers were an insignificant proportion of persons engaged, the same imputation was made.

The most serious limitation of the BLS estimates in recent years, from the standpoint of our concept, is that they relate to average hours paid for rather than worked. This limitation is probably not important prior to World War II,[41] although the derived level of manhours may be a little higher than one representing hours actually worked. But during and since the war, labor has obtained a gradual increase in paid leave. Thus, over the last decade, our average hours and manhour estimates have some upward bias as a measure of time actually worked. This bias has been mitigated, however, because beginning in 1947 average hours worked in manufacturing were derived from the Census Bureau's *Annual Survey of Manufactures*, in which manhours relate to time actually worked. Also, in the general-government and the finance and services segments, the estimates are for hours actually worked.

For finance and services, we employed unpublished estimates based on tabulations made by the Bureau of the Census from the Current Population Survey data beginning with 1944. These estimates are based on averages

[40] Some of the hours series formerly compiled by the National Industrial Conference Board have also been employed.

[41] See, for example, "Holiday Provisions in Union Agreements in 1952–53," *Monthly Labor Review*, Bureau of Labor Statistics, February 1954: "Prior to World War II, paid holidays for wage earners in manufacturing, construction, and mining industries were found in few agreements" (p. 128).

that exclude the influence of zero-hour workers and thus represent hours actually worked. Since by the labor-force concept the average hours estimates refer to workers whose main job is in the primary industry, we assumed that the hours of part-time primary workers were offset by hours worked in other industries by other primary employees. The Census average hours estimates were therefore multiplied by full-time equivalent employees in order to arrive at manhours. An average hours figure for this segment for 1940 was computed from the *Census of Population*. Estimates were available for 1920–22 from the National Bureau study by Willford I. King,[42] which was also used for some other industries. Prior to 1920, it was necessary to do what Harold Barger[43] did in trade—to estimate average hours worked from state data. The data were fragmentary and, therefore, not too reliable, but the indicated trends appear to be reasonable.

In manufacturing, construction, steam railroads, and gas utilities, the average hours estimates were pushed back to earlier decades by means of available estimates of the standard, or full-time, workweek. The latter were adjusted to represent average hours actually worked by means of a regression between the ratios of actual to full-time average hours and the ratios of employment to the labor force in the industry, calculated from estimates for years in which actual average hours estimates were available.[44] Although the coefficients of correlation are high, it is clear that the average hours series are better indicators of trend than of annual movement, in the earlier decades.[45]

In the several nonagricultural industries in which proprietors and unpaid family workers were a significant portion of the total working force, an adjustment in the level of average hours was made. Estimates made by the Census Bureau in connection with the *Monthly Report on the Labor Force* reveal that since 1944, when separate data became available, this class of worker has persistently worked substantially longer hours per week than employees. The Census Bureau prepared, on request, a tabulation showing average hours worked by proprietors and unpaid family workers in 1954 for all the industry segments in which they were a factor: contract construction, trade, finance, and services. These industry estimates were extrapolated back to 1946 by the average hours worked by all proprietors and family workers, and to years before 1946, by the average hours worked

[42] *Employment, Hours and Earnings in Prosperity and Depression, United States, 1920–1922*, 2nd ed., New York (NBER), 1923.

[43] *Distribution's Place in the American Economy since 1869*, Princeton University Press (for NBER), 1955.

[44] See Leo Wolman, *Hours of Work in American Industry*, Bulletin 71, New York (NBER), 1938: "In the long run, actual hours will, in all probability, have the same general trend as full-time hours, but deviations of one from the other will occasionally be more or less sharp, depending on the state of business and employment" (p. 5).

[45] As Wolman points out: "Comparing similar periods of business activity, percentages of time lost appear remarkably steady" (*ibid.*, p. 18).

by employees. A somewhat different procedure was used by Barger, whose figures on average hours worked by all persons engaged in trade were used prior to 1919 (see Appendix F).

For key years, a summary of the industry and sector average hours worked per week is shown in Table A-IX. In interpreting this table, it must be remembered that the weekly averages represent the quotient of average annual hours per person and 52. Thus, slack time in the farm sector pulls down the average weekly hours per year as compared with hours worked during full-time weeks. Average hours worked by government employees are low due to generous leave provisions for federal employees throughout the period and to the summer holidays of public school teachers. In the latter case, an increasing number of school days per year increased the average hours worked per year up to 1909 and thus the average hours per week as we compute it, although the length of the weeks actually worked presumably did not change significantly. Total manhours worked in major sectors of the economy are shown annually in Table A-X. A distribution of manhours by industrial segments is shown for key years in Table A-XI.

Comparison with the Census survey estimates. For the period since 1940, it is possible to compare our estimates of average hours, manhours, and persons engaged in civilian industry with like estimates contained in the Census Bureau's *Monthly Report on the Labor Force* (MRLF); we do so in Table A-XII. The MRLF average hours estimates are based on a weighted distribution of persons engaged classified by single hours-of-work classes exclusive of zero hours. To obtain manhours, the average hours so computed (adjusted to eliminate the effect of holidays falling in the survey week) were multiplied by the average number of all workers, excluding persons with a job but not at work.

The derivation of the total manhours estimates used in this study was as outlined above and described in more detail in the following appendixes. Average annual hours estimates are the quotient of manhours and persons engaged (which includes employees in terms of full-time equivalents as estimated by the Department of Commerce). It should be remembered, however, that except in the farm sector, no attempt was made to reduce proprietors and unpaid family workers to full-time equivalents. Average annual hours were divided by 52 to convert them to a weekly basis.

With respect to the average hours comparison, it will first be noted that the MRLF series averages about 2.5 per cent higher than our series. This is partly because our employment estimates for some industries (other than general government, farming, manufacturing since 1947, and finance and services) include persons who are on paid leave. Based on a special Census survey which revealed that 67 per cent of the persons with a job but not at work in the week of July 2–8, 1950 were on paid leave, we have

estimated that this factor accounts for almost half the discrepancy in 1950. It could, however, be more important in helping explain why the MRLF series shows a somewhat greater decline in the postwar period than the industry composite. The MRLF figures in Table A-4 show that an increasing proportion of persons with a job are not at work, a development which is undoubtedly due primarily to the increasing trend towards paid leave.

TABLE A-4

Civilian Economy: Persons with a Job but Not at Work in Relation to Total with a Job, 1940–57

	Total with Job (000)	*With Job but Not at Work* Number (000)	Per Cent of Total
1940	47,520	1,190	2.5
1941	50,350	980	1.9
1942	53,750	1,100	2.0
1943	54,470	1,220	2.2
1944	53,960	1,760	3.3
1945	52,820	2,010	3.8
1946	55,250	2,260	4.1
1947	58,027	2,474	4.3
1948	59,378	2,751	4.6
1949	58,710	2,530	4.3
1950	59,957	2,648	4.4
1951	61,005	2,680	4.4
1952	61,293	2,814	4.6
1953	62,213	2,798	4.5
1954	61,238	3,036	5.0
1955	63,193	2,932	4.6
1956	64,979	3,160	4.9
1957	65,011	3,017	4.6

Another important reason for the difference in level is that the MRLF shows a higher workweek in agriculture than that implied by our figures. This is due in part to the inclusion in our series of children under fourteen years of age, seasonal immigrants, and certain part-time workers not covered by the Census Bureau (see Appendix B).

A noticeable feature of the average hours comparison is the somewhat greater increase in average hours shown by MRLF than by the industry composite during World War II, especially in 1943. This may be explained by the nature of the Commerce Department's full-time equivalent employment estimates. Standard factors were developed to convert full- and part-time employment to a full-time equivalent basis. During World

War II, the volume of part-time employment increased. A correct year-to-year adjustment to a full-time basis would have yielded a smaller increase in persons engaged and a larger increase in average hours worked during these years. But this bias is partially compensated for in the manhour estimates by the difference in the employment estimates.

The composite-industry employment estimates average 4.3 per cent higher than the MRLF estimates because of the lower age cutoff in the latter, the fact that proprietors and unpaid family workers have generally not been reduced to full-time equivalents in the former, and other factors mentioned earlier. The discrepancy more than offsets the opposite differential in average hours; so the aggregate of industry manhours is larger than the MRLF total. This is to be expected in view of the different concepts underlying the two measures.

A more important consideration is the relative movements of the two manhours series. Over the period 1940–53 as a whole, the MRLF total increased by 21.6 per cent compared with an 18.0 per cent increase in the industry aggregate. Hence, our broad conclusions as to trends in productivity would not be significantly affected by the use of one series rather than the other. Year-to-year changes show considerably less correspondence; this underscores the frequent warning not to place too much stress on the precise magnitude of annual changes. In general, because of the small sample on which the MRLF is based and the greater possibility of household respondent errors, the industry composite should be the more reliable series. Certainly, the industry employment estimates, based largely on Social Security and other comprehensive government reporting systems, are more accurate. The average hours series are less reliable on both bases, but the industry-composite average hours series shows closer agreement with the MRLF averages than do the employment estimates.

LABOR INPUT (WEIGHTED MANHOURS)

In accordance with our basic concepts, manhours worked in the various industry groups or segments were weighted by average hourly earnings in order to obtain aggregate measures of labor input. These indexes, shown in the productivity summary tables, are used in direct comparisons with output and in comparisons in which they are combined with capital input to form measures of total factor input. Since interest also attaches to employment and manhours (unweighted) in relation to output, these ratios are also generally shown in the summaries.

Sources and methods. As described in later appendixes, manhours were weighted by average hourly employee compensation by industry groupings within the segments of mining, manufacturing, transportation, and communications and public utilities. In order to get a measure of real labor input in the economy as a whole, indexes of manhours or of real labor

input in the several industrial divisions were weighted as follows: Average hourly labor compensation was computed from the Commerce estimates of labor compensation and our employee manhours estimates (based on the Commerce employment estimates that are consistent with the compensation figures) for 1929, 1937, 1948, and 1953; similar estimates were made for 1929 and 1919 using the Kuznets compensation and employment series in conjunction with our average hours estimates; these were linked to the Commerce estimates in order to form a continuous series.

In effect, the annual manhours estimates (or base-period 1929 manhours extrapolated by real labor input in the four segments noted above) were weighted in each of the subperiods by the mean of average hourly compensation of the first and last year of each subperiod. In practice, we extrapolated the base-period 1929 compensation (blown up to include compensation for the labor of proprietors and unpaid family workers) by the indexes of average hourly compensation in each segment, the latter being obtained for the four segments by dividing current-dollar compensation by real labor input. From the resulting figures we computed the industry proportions of the aggregate in each key year, and averaged these ratios for the two bounding years of each subperiod to use as weights for the annual indexes of manhours or of real labor input. This gives the same result as weighting manhours directly. The 1919–29 average weights were applied to prior years, since average earnings estimates before 1919 could not readily be made for some of the segments. The relative industry weights for the several subperiods are shown in Table A-5.

Effect of weighting. The weights for most of the industry divisions are so stable over the subperiods that there is little difference between aggregates obtained by using changing weights based on the Marshall-Edgeworth formula and those obtained by using fixed (1929) weights. This comparison is not shown for the economy, but a similar comparison for the manufacturing segment points up the minor effect of alternative weighting schemes (see Table D-11). The persistence of interindustry wage-rate differentials is the result of similar percentage changes in wage rates in the various industry groups over intermediate periods.

However, weighting manhours by industry compensation rates yields a labor input aggregate that moves very differently from an unweighted manhour aggregate. As shown in Table A-XIII, weighted labor input in the economy rose almost 40 per cent more between 1869 and 1953 than manhours worked. This is the result of interindustry differentials in average hourly earnings and of the relative shift of persons and manhours towards the higher-paying industries.

The effect on labor input of the growing relative importance of general government is noticeable, but not very great since the low pay of the armed forces tends to pull average hourly earnings of government employ-

ees down to the level of average pay in the private economy. Almost half of the greater proportionate rise in aggregate labor input than in manhours is due to the relative shift of manhours from the farm sector to the private nonfarm sector (Table A-XIII, column 11). The balance is largely attributable to the relative shift of manhours worked within the private nonfarm sector toward the better-paying industries. If manhours could have been weighted in greater industry detail than the forty-seven groups used for that purpose, labor input might well have risen even more than indicated by our calculations.

Although Table A-XIII shows only key years, annual indexes of manhours and of labor input are shown in Tables A-XIX and A-XXII for the national economy and the private domestic sector. From these tables, the annual effect of interindustry manhour shifts on labor input can be computed.

TABLE A-5

National Economy: Relative Weights of Labor Input, by Sector and by Industrial Division, Subperiods, 1919–53
(per cent)

	1919–29	1929–37	1937–48	1948–53
Total economy	100.0	100.0	100.0	100.0
General government	6.2	6.8	5.7	5.1
Private economy	93.8	93.2	94.3	94.9
Farm	9.9	7.5	11.4	11.9
Nonfarm	83.9	85.7	82.9	83.0
Agricultural services, forestry, fisheries	0.3	0.4	0.4	0.4
Mining	2.8	2.7	2.8	2.9
Construction	6.8	6.5	6.0	6.1
Manufacturing	25.2	25.9	25.0	25.1
Trade	21.0	20.4	20.3	20.0
Finance, insurance, real estate	5.1	5.0	4.1	3.7
Transportation	7.8	8.3	8.3	8.6
Communications and public utilities	2.3	2.7	2.8	2.7
Services, domestic	2.4	2.6	3.4	3.9
Services, other than domestic	9.1	9.9	8.6	8.5
Government enterprise	1.1	1.3	1.2	1.1

Industry distributions. Much of the statistical work relating to labor is summarized for selected years in Table A-XIV. The percentage distributions of employment, manhours, and labor inputs are based on the preceding analyses. The distributions reveal the relative shifts of labor among the major sectors and industries of the economy. They also show the different relative importance of the various industries depending on which labor measure is used.

The distribution of manhours depends not only on the number of persons engaged in the various industries, but also on the average number of hours worked per person. Thus, the relative importance of government is less on a manhours basis than on an employment basis because of the lower average number of hours worked per year by federal employees and public school teachers; the relative importance of the service industries is higher because of the greater-than-average number of hours worked per year. The relative importance of industries by the criterion of real labor input is again different as a result of industrial differences in average hourly earnings. Thus, farming and the service industries have a much lower share of labor input than of manhours because of relatively low earnings, while the converse is true, for example, of construction and manufacturing. The several percentage distributions have also shown somewhat different relative changes over time as a result of differing relative changes in the workweek and in wage rates among industries.

Real Capital Stocks and Services

In Chapter 2, the rationale was developed for the proposition that real capital input tends to parallel the movement of real capital stocks, net of depreciation in the case of reproducible fixed capital assets. Here we describe the sources and methods used in estimating capital stocks in constant dollars and rates of capital compensation by sector. The latter are used to translate the stock figures into real capital services, or input, thus making it possible to combine capital services in the several sectors with each other and with the estimates of labor input.

The real capital stock estimates have been built up by major sectors corresponding to those used for the national product estimates. However, no breakdown by industry segment within the private nonfarm sector was attempted. The wealth estimates of Raymond Goldsmith[46] were used for net foreign assets and, with some modification, for the general-government and private nonfarm nonresidential sectors. The capital stock estimates by Alvin Tostlebe,[47] supplemented by Goldsmith's estimates, were used for the farm sector; and those by Leo Grebler, David M. Blank, and Louis Winnick[48] were used for nonfarm residential property. A summary of annual constant-dollar stock figures by sector is shown in Table A-XV.

The capital estimates for the domestic economy were recombined by major types of tangible assets in order to permit the calculation of ratios

[46] *A Study of Saving in the United States*, Princeton University Press, 1956, Vol. III, Table W-3, p. 20. These data are carried forward in the *Postwar Capital Market Study* (unpublished).

[47] *Capital in Agriculture: Its Formation and Financing since 1870*, Princeton University Press (for NBER), 1957, Table 9, p. 66.

[48] *Capital Formation in Residential Real Estate: Trends and Prospects*, Princeton University Press (for NBER), 1956, Table D-1, p. 360.

of output to capital by type. This could be done for structures, equipment, and inventories. Estimates of agricultural land also seemed sufficiently reliable for this purpose. In the case of nonfarm site land, the Goldsmith convention of assuming proportionality to the real value of structures was followed; so estimates for this class of land could not be meaningfully related to output. The estimates of capital stock by type are presented in Table A-XVI.

NET FOREIGN ASSETS

Since the national income is defined in terms of the income accruing to the labor or capital supplied by the permanent residents of the nation, it is necessary to include in the national capital the value of assets owned by United States residents and located abroad less the value of foreign-owned assets located in the United States. When the role of productivity in increasing real income per capita is being considered, it is necessary to relate real income to population and to input on a national basis, since the real income produced by net asset holdings in foreign countries may be a significant factor in the plane of living of the nation's residents. However, for reasons developed earlier, it is desirable for some purposes to exclude net income from abroad from national income estimates and, correspondingly, to exclude net foreign assets from capital estimates. The income and capital tables have therefore been set up in such a way that productivity comparisons can be made on a domestic as well as on a national basis.

The capital items involved in the computation of net holdings of foreign assets comprise not only direct investments in real productive facilities, but also financial claims. This is in contrast to our treatment of domestic capital, whereby we include only real items, and not the claims thereto, in order to avoid double counting. Underlying financial holdings abroad, however, are real income-producing assets that are not otherwise counted, whereas financial resources of foreigners in this country are offsets against the value of real capital domestically located, since part of the income must go to the foreign holders. For this reason, it was not feasible to break down net foreign assets by type of real capital, as is done in Table A-XVI for domestic capital.

The estimates used are those prepared by Goldsmith as published through 1945, and as revised and extended from 1946, benchmarked on the Treasury Department *Census of Foreign-Owned Assets in the United States* (1945) and *Census of American-Owned Assets in Foreign Countries* (1947). Goldsmith's current value figures from 1929 forward are based on unpublished estimates prepared by Robert Sammons and extrapolated by published and unpublished estimates of the Department of Commerce going back to the 1920's and by capital movement statistics collected

regularly by the Treasury Department. Estimates for earlier years were based on a variety of sources, described in the notes to the relevant tables.

A rough check on the movement of the current value net foreign asset estimates is provided by the net foreign investment component of the national product. Theoretically, this item measures net sales (purchases) to (from) foreigners on capital account. A positive foreign balance, for example, may be associated with a net increase in American capital holdings abroad or a net decrease in foreign investments in the United States. If the basic data underlying the foreign accounts were perfect, the change in net foreign assets should equal net foreign investment.

Goldsmith calculated that over the period 1897–1949 net holdings of assets abroad increased by about $50 billion, as a result of an increase in foreign assets held by Americans of $59 billion offset by total net foreign investments in the United States over the same period of about $9 billion. Net foreign investment, estimated by the balance-of-payments current account approach, shows cumulated net capital exports (for net acquisition of foreign assets) of about $44 billion. "The difference of nearly $6 billion, or about 12 per cent, for the period as a whole appears moderate in view of the nature of the data from which both estimates were derived."[49] It should be noted, however, that the difference was generally in the opposite direction until the mid-1930's.

Deflation of net foreign assets poses difficult conceptual as well as statistical problems. Even for each of the two capital categories—domestic and foreign—there are no specified underlying assets that can be priced, and the difference between the two value aggregates is even further removed from tangible assets. Goldsmith used a generalized purchasing power index for deflation. This is consistent with the deflation procedure for net factor income from abroad. Yet it could be argued that the deflator for domestic investment is more appropriate in the sense that it would roughly indicate what the net foreign capital would purchase, if liquidated, in terms of tangible domestic assets.

GOVERNMENT CAPITAL

The estimates of reproducible civilian capital stocks owned by federal, state, and local governments are those of Raymond Goldsmith. We narrowed somewhat his estimate of public land holdings and extrapolated the base-period value by different methods. For the sake of consistency with national product sectoring, we estimated roughly the capital stocks held by government enterprises for inclusion in the business sector. Similarly, we subtracted these estimates from the adjusted Goldsmith figures to obtain public capital held by civilian general government.

[49] Goldsmith, *op. cit.*, Vol. II, p. 601; cf. Table B-91, p. 602.

For structures, the chief component of general-government capital, we used the 1929-dollar estimates of Goldsmith.[50] These were derived by cumulating net investment in 1929 prices, starting with the estimated value in 1896. The latter was obtained by cumulating gross outlays less depreciation for the number of years preceding 1896 corresponding to the assumed length of life of the category of asset involved. The sources of the outlay estimates, the lengths of life assumed, and the deflators employed are referred to in Goldsmith's Table W-7. We pushed the Goldsmith real-stock estimates back of 1896 by cumulatively subtracting Kuznets' net public nonwar construction expenditure estimates in 1929 prices.[51]

Federal government equipment expenditures were taken from Budget Bureau compilations of obligations by object of expenditure and from other fiscal statements for earlier years.[52] Local government equipment expenditures were estimated roughly as a fixed percentage of total capital outlays less street and highway construction, based on capital expenditure estimates of the Governments Division of the Census Bureau (see notes to Goldsmith's Table G-6). An average life of twelve years was assumed in calculating depreciation—approximately the same average used in business accounting. Deflation was accomplished by the over-all implicit price deflator for nonfarm producer durable equipment.

Goldsmith's estimates of the stock of equipment held by governments seem to be seriously understated. The current value estimates for 1939 are substantially below Reeve's.[53] The depreciated value of all state and local capital assets, excluding roads and streets, is also substantially below the estimate by Fabricant.[54] As Goldsmith points out, the lack of distinction between current and capital outlays in the Treasury accounts raises the danger of missing certain expenditures that would be capitalized by business. This is particularly true of equipment, since independent estimates of government construction outlays are available. Not only are the basic data for state and local governments incomplete, but the segregation of equipment outlays is largely conventional. At any event, no allowance is made in Goldsmith's estimates for equipment expenditures of state governments. Since the estimate by Reeve for 1939 seems more realistic as to level, we raised the Goldsmith estimates of the real stock of public equipment (exclusive of Reconstruction Finance Corporation stocks) throughout by the ratio of his estimate for 1939 to the Reeve calculation.

[50] *Ibid.*, Vol. III, Table W-3 (col. 10).

[51] *Capital in the American Economy.*

[52] See Goldsmith, *op. cit.*, Vol. I, notes to Tables F-2 and F-16.

[53] J. E. Reeve *et al.*, "Government Component in the National Wealth," *Studies in Income and Wealth, Volume 12*, New York (NBER), 1950, Table 5, p. 487.

[54] Goldsmith, *op. cit.*, Vol. II, pp. 578–79.

The Goldsmith estimates of inventories, which we use, cover federal government corporations and credit agencies and state and local governments, based on the sources already described. The price deflator was the wholesale price index, except for federal corporations from 1935 on, for which the index for wholesale prices of farm products was used because of the predominance of Commodity Credit Corporation inventories. Goldsmith did not include federal general-government inventories. These are presumably quite small, since the much larger state and local government inventories were valued at only $60 million in 1929.

The final step in the estimation procedure was to deduct estimates of reproducible assets (by type) held by government enterprises from the Goldsmith totals, as adjusted. This was simple in the case of assets of federal corporations and other enterprises (except the Post Office), since separate estimates are presented by Goldsmith. The case of other enterprise assets was handled by a fixed percentage deduction of one-seventh from assets net of those just mentioned. This percentage was based on a 1939 estimate for state and local enterprises derived from Fabricant[55] plus an estimate for the value of Post Office assets of around half a billion dollars. An examination of functional classifications by Fabricant of state and local capital assets[56] does not indicate any decided trend in the proportion of the total accounted for by enterprises. Similarly, the ratio of public buildings outside the District of Columbia (a substantial part of which is Post Office property) to total federal nondefense assets excluding corporations and credit agencies has been relatively stable in this century. It is clear that a flat deduction to remove government-enterprise assets from the totals for structures and equipment is somewhat arbitrary. However, errors from this source should have little effect on the movement of either general-government reproducible capital or private nonfarm reproducible assets. At the same time, the relative magnitudes of capital assets in the two sectors should be more accurately reflected in the adjusted figures.

The Goldsmith estimates of public lands are tied into the Reeve estimates for 1939 and 1946, with an allowance for the value of land beneath streets and highways. We have accepted the base values, with two exceptions. First, in line with procedure in the private economy, we did not include the value of subsoil assets, primarily because of the conceptual and statistical measurement problems and the relatively small magnitude of the associated net royalty. Second, we excluded the value of land in the public domain not withdrawn for specific use. Although this has been a relatively small item since 1939, it was much larger in earlier times. As there is little connection between this domain and current production, it did not seem appropriate to include it for purposes of productivity comparisons.

[55] *The Trend of Government Activity*, Table C3, p. 209.
[56] *Ibid.*, Tables C5 and C7, pp. 211, 213.

In extrapolating the base-period land values, Goldsmith used the value of tax-exempt land, deflated by the wholesale price index. Since tax-exempt land includes more than public land, and since the unit values of such land may deviate widely from wholesale prices in movement, we used a different procedure. Site land, which comprises the bulk of the value of public land, was extrapolated by the real value of public structures and other improvements, in line with procedure in the private nonfarm economy. The other public land included consists of forest land, and the much less important park areas. Estimates of the constant-dollar value of public forest land are those prepared by Reuss.[57] They have been extrapolated forward, and back to 1920, by estimates of the acreage of public forest and woodland supplemented by estimates of forest acreage under the Forest Service Administration.[58] Allowance was made for the downward trend in lumber stands and thus in real value per acre, which is apparent in the 1929–46 estimates. Prior to 1910, the real value was extrapolated by available estimates of total forest acreage.[59]

Estimates of the acreage of public park lands were made by Reuss for 1929, 1939, and 1944.[60] These estimates were interpolated and extrapolated forward, and back to 1916, by acreage under the National Park Service, which accounts for the bulk of the total.[61] Park areas have grown even faster than urban population since 1916, but we used the latter series to extrapolate earlier years. Since the 1929 dollar value of park areas was only about $25 million in 1916, errors in the extrapolation procedure are unimportant. The base-period value of $52 million was computed as an extrapolation of a 1939 estimate by Reeve.[62]

FARM CAPITAL

The derivation of estimates in this sector is described in Appendix B. Briefly, our series are based on the estimates by Tostlebe, interpolated and supplemented by the estimates of Goldsmith.

NONFARM RESIDENTIAL REAL ESTATE

The estimates of the stock of nonfarm residential structures in 1929 dollars, prepared by Grebler, Blank, and Winnick,[63] are the basis of the capital series for this sector. The Grebler estimates represent a cumulation of

[57] Lawrence A. Reuss, "Land Utilization Data as Background Information for the National Balance Sheet and Approximations of the Value of Forest Lands," *Studies in Income and Wealth, Volume 12*, p. 231.
[58] *Historical Statistics*, Series F 45 and F 70.
[59] *Ibid.*, Series F 35.
[60] *Op. cit.*, Table 3, p. 228.
[61] *Historical Statistics*, Series F 17.
[62] *Op. cit.*, p. 518.
[63] *Op. cit.*, Table D-1, pp. 360–61.

annual net additions in 1929 dollars to the permanent nonfarm housing stock.

The underlying estimates of gross expenditures for new units, additions, and alterations were those of the Commerce Department back to 1921, extended to 1889 by estimates prepared by David M. Blank.[64] The deflator was the construction cost index compiled by E. H. Boeckh and Associates (Cincinnati, Ohio, and Washington, D.C.) extrapolated to 1889 by a weighted average of wage rates and materials prices. Comparison indicates a high degree of conformity over the long period between the Boeckh index and indexes of market prices of standard nonfarm residential structures.[65] The expenditure estimates were tied into an initial wealth estimate based on the number of units in 1890 and the average value per unit derived from the Census *Report on Real Estate Mortgages, 1890.* Although independently derived, the 1890 wealth estimate agrees quite closely with Kuznets' estimate for the same date.[66] In going from 1890 to 1869, we have subtracted Kuznets' annual estimates of net nonfarm residential outlays in 1929 dollars from the Grebler end-of-year stock estimate for 1889.

Depreciation was computed by the declining balance method, a rate of 2 per cent being applied to the cumulated value of structures as of the end of each preceding year, and a half-year's depreciation charged against current-year construction. A relatively small additional allowance for demolition was added to depreciation to obtain total capital consumption. This method differs from Goldsmith's method, which involved straight-line depreciation over sixty years for one- to four-family structures, fifty years for multifamily structures, and thirty years for additions and alterations. The Grebler approach [67] implies a somewhat longer average length of life and produces higher depreciation charges during the first two decades or so, and smaller charges thereafter. Further, some value remains indefinitely in the stock, although it eventually becomes negligible. On the basis of an appraisal by the Federal Housing Administration of a sample of houses during 1939, and other evidence, the Grebler method seems somewhat more realistic than the Goldsmith technique.

In practice, the results obtained in the two investigations do not differ greatly. Starting from approximately the same level at the end of 1896, the Goldsmith estimates of the real stock of structures rise somewhat less rapidly than the Grebler estimates until 1909 but catch up with the latter by 1919. The rates of increase during the twenties are such that the

[64] *The Volume of Residential Construction in 1889–1950,* Technical Paper 9, New York (NBER), 1954.

[65] Grebler, Blank, and Winnick, *op. cit.*, Appendix C.

[66] *Ibid.*, p. 365.

[67] Cf. *ibid.*, p. 379.

Goldsmith estimate is over 10 per cent higher than the Grebler estimate by the end of 1929. Approximately the same differential prevails at the end of 1949. The difference in behavior is presumably due to the different methods of calculating capital consumption, since both investigators used the Commerce Department gross expenditure estimates.

The authors of the estimates used here have compared their stock and net capital formation estimates with several independent sets of wealth estimates for various years from 1890 to 1950. There are, of course, difficulties in such comparisons as a result of certain differences in coverage, valuation, and the treatment of the land factor relative to the stock of structures. In general, over relatively long periods of time, the correspondence between the two types of estimates is fairly close. In terms of net capital formation, between 1890 and 1930 the two sets of estimates differ by less than 1 per cent, since subperiod discrepancies are virtually canceling. From 1930 to 1940, however, cumulated net investment is only slightly negative, compared with a considerably larger decrement indicated by the wealth estimates. Conversely, from 1940 to 1950 the housing censuses indicate a much larger volume of net capital formation than is shown by the estimated capital formation series. The net shortage by 1950 is almost 5 per cent of the stock estimate; which suggests that the postwar stock of nonfarm residential capital may be understated in the estimates used here.

With the Grebler-Blank-Winnick estimates of the real stock of structures accepted, there remained the problem of estimating the real value of the underlying land. On the basis of FHA appraisal and tax assessment data beginning in the 1930's, a benchmark estimate in the 1920's, and an estimate for 1907, the authors conclude that the proportion of land to total nonfarm residential real estate, in current values, fell linearly from 40 per cent in 1890 to about 17 per cent in 1953. The principal force adduced to explain this trend is suburbanization.

The statistical basis for the trend seems quite slender, particularly prior to the 1930's. Goldsmith chose to use a constant land-structure ratio for the period since 1896, although it appears that the basis for this technique is more tenuous than that underlying the Grebler procedure. Even if certain land-structure ratios based on current values are accepted, there is no warrant for applying these to constant value structure estimates (and Grebler explicitly refrains from doing so), since the implication would be that land and building prices move proportionately. This seems unlikely, although data on land prices are sadly lacking.

In view of our ignorance in this area, we chose to assume a constant ratio between real land and structure values over time. It is true that the relationship in real values may deviate from the physical-volume relationship as the average quality of structures changes or as relative shifts occur

in the types of land utilized with respect to price classes.[68] But the proportionality assumption is clear and unambiguous, and makes it possible to interpret the ratios of the real capital involved to the output measures as essentially structure-output ratios. However, a base-period markup of the structures to cover land values is necessary in order to portray more accurately the relative size of capital stocks in the various industries or sectors and to obtain more accurately weighted aggregate capital inputs.

The Grebler ratio of the value of land to structures for 1929 has been chosen in preference to the somewhat lower Goldsmith ratio, since the information used by Goldsmith relates entirely to 1930 or later years, whereas Grebler and his associates had more relevant data, some of it relating to the 1920's.

NONFARM NONRESIDENTIAL CAPITAL

This is the largest portion of the capital estimates, comprising all private industries except farming and residential real estate. The total was estimated by summing Goldsmith's series for the several types of capital goods in constant dollars for the sector, with a few adjustments to his figures such as the inclusion of government-enterprise capital. For weighting, the total was split between manufacturing (derived as indicated in Appendix D) and an "all other" residual. Although we did not attempt a finer breakdown by industry, a comparison was made, in selected years, with the sum of the available industry estimates used in the industry productivity comparisons.

The stock of structures was estimated as the sum of nonfarm nonresidential, underground mining, and institutional structures,[69] plus government-enterprise structures estimated as described above. The sum of these categories was carried back from 1896 to 1869 by cumulatively deducting Kuznets' estimates of net private nonresidential construction in 1929 dollars, less the net change in the real value of farm structures estimated as described in Appendix B. The sources of Goldsmith's gross outlay estimates, deflators, and depreciation rates are described in his Table W-7.[70]

The real value of site land was obtained by applying a constant ratio (0.39) to the estimates of the real value of structures. The ratio was obtained from the 1929 estimates for structures in relation to those for land, as built up by Goldsmith from land-structures ratios for several types of property, but excluding his estimate of the value of vacant lots.[71] To the

[68] The shift of population to the suburbs has increased the proportion of relatively less valuable lands; this has tended to be offset by a concomitant increase in the average size of lots.

[69] Goldsmith, *op. cit.*, Vol. III, Table W-3 (cols. 6, 7, and 9).

[70] *Ibid.*, pp. 32–33.

[71] *Ibid.*, Vol. I, Table B-51; Vol. III, note to Table W-1, p. 12.

estimates for site land were added the Goldsmith estimates for private nonfarm forest land,[72] extrapolated prior to 1900 by the same over-all series used for public forest land.

For the stock of producers durable equipment, we started with the Goldsmith estimates,[73] less his estimates of the real stock of farm equipment.[74] In general, Goldsmith used the gross outlay figures of the Commerce Department, extrapolated by the estimates of William H. Shaw, with lengths of life used for depreciation drawn from those allowed for tax purposes by the Internal Revenue Service as shown in *Bulletin "F"*.[75] Goldsmith's estimates include only 10 per cent of the real value of passenger cars, compared with a 30 per cent allowance for business use in the investment component of the gross national product. For the sake of consistency with national output, we adjusted the Goldsmith business passenger-car stocks upwards accordingly, after taking account of the fact that 10 per cent or so of the stock is already included in the farm-equipment stock estimates. We have also eliminated that part of the equipment stock estimates which represents equipment owned by general government. The end-of-year real-stock estimate for 1896 served as a base from which estimates by Kuznets of annual net expenditures for producers durable equipment in 1929 prices (after deduction of net changes in equipment stocks of farmers and general government) were successively subtracted back to 1869.[76]

Goldsmith's estimates of private nonfarm inventories in 1929 dollars are given in his Volume III, Table W-3 (column 17). The 1896 figure was carried back to 1869 by cumulatively deducting Kuznets' estimates of the real net change in business inventories[77] less our estimates of the net change in farm inventories described in Appendix B. It should be noted that prior to 1919 the inventory estimates are largely based on a relationship to the national product since no adequate benchmarks are available in the early period. To obtain a total for the sector, we have added inventories held by the government corporations, described above, to the estimates by Goldsmith.

Total real capital stocks in the private nonfarm nonresidential sector are the sum of the estimates for structures, land, equipment, and inventories. Since the stock estimates are on a year-end basis, two-year moving averages were taken in order roughly to convert them to a calendar-year basis.

[72] *Ibid.*, Vol. III, Table W-3 (col. 24).
[73] *Ibid.*, Vol. III, Table W-3 (col. 12).
[74] *Ibid.*, Table W-7, p. 35.
[75] *Income Tax Depreciation and Obsolescence, Estimated Useful Lives and Depreciation Rates*, rev. ed., 1942; Goldsmith's lengths of life, *op. cit.*, Table W-7; Shaw's estimates, *Value of Commodity Output since 1869*, New York (NBER), 1947.
[76] *Capital in the American Economy.*
[77] *Ibid.*

Having been built up independently, the capital stock estimates for the sector are not necessarily consistent with those for the several industry segments described in later appendixes: manufacturing, mining, transportation, and communications and public utilities. It is possible, however, to subtract the sum of fixed capital (excluding land) in the covered segments from the private nonfarm, nonresidential aggregate in order to obtain a residual, which may be assessed for reasonableness. This has been done in Table A-6 for the key years of the period, 1899–1953, for which Goldsmith's estimates were used to obtain the aggregate. The stock estimates have been related to manhours in both the covered and uncovered segments.

The level of capital per manhour in the uncovered area is less than half that in the covered segment. This does not seem unreasonable inasmuch as the uncovered area consists chiefly of trade, finance (excluding residential real estate and property rented to the covered segments), and services. Also, the comparison excludes inventories, which account for about half of trade capital, and land, which is the chief factor in the uncovered forestry industry. The movement of capital per manhour in the two areas is broadly similar. The rise between 1899 and 1909 of capital relative to manhours in the uncovered segment appears steep compared with other decade changes in either area—suggesting that the 1899 estimate for total capital may be low or that the aggregate of the covered segments may be high. In general, however, the greater rise of capital stocks in the uncovered sector than in the covered seems plausible.

The aggregate estimates and the estimates for the covered segments were independently prepared. The estimates for manufacturing and mining are deflated Census and Internal Revenue Service asset data, rather than a cumulation of deflated net investment as are Goldsmith's estimates. The estimates by Melville J. Ulmer[78] of capital in the regulated industries were obtained by the same method as that used by Goldsmith but were based on independent capital outlay estimates. Also, Ulmer based his initial 1870 stock estimate on a Census figure, whereas Goldsmith obtained his initial stock estimate by cumulating net investment of previous years. So the levels of the two series are not necessarily consistent.

Goldsmith has compared his wealth estimates based on the "perpetual inventory" approach with Census-type estimates, and found the general correspondence to be good—better for the long trend than for shorter movements. This was also true of a comparison involving the largest component, nonfarm land and structures, except in the census year 1912, when the Goldsmith estimate is significantly lower.[79] In an earlier

[78] *Capital in Transportation, Communications, and Public Utilities: Its Formation and Financing*, Princeton University Press (for NBER), 1960.

[79] Raymond W. Goldsmith, "A Perpetual Inventory of National Wealth," *Studies in Income and Wealth, Volume 14*, New York (NBER), 1952, pp. 46–57.

TABLE A-6

Private Nonfarm, Nonresidential Economy: Fixed Reproducible Capital in Relation to Manhours, Covered Industries, Residual Uncovered Sector, and Total, Key Years, 1899–1953

	Capital			*Manhours*			*Capital per Manhour*		
	Total	Covered Sector (billions of 1929 dollars)	Residual	Total	Covered Sector (billions)	Residual	Total	Covered Sector (1929 dollars)	Residual
1899	37.0	30.1	6.9	49.5	23.0	26.5	0.75	1.31	0.26
1909	60.5	46.4	14.1	66.6	32.5	34.1	0.91	1.43	0.41
1919	79.9	60.9	19.0	75.4	38.6	36.8	1.06	1.58	0.52
1929	104.6	78.7	25.9	89.5	37.1	52.4	1.17	2.12	0.49
1937	97.9	70.1	27.8	77.6	30.8	46.8	1.26	2.28	0.59
1948	114.6	84.7	29.9	101.3	44.5	56.8	1.13	1.90	0.53
1953	145.5	101.8	43.7	108.0	47.5	60.5	1.35	2.14	0.72

NOTE: Covered sector comprises manufacturing, mining, transportation, and communications and public utilities; uncovered sector comprises construction, trade, finance, services, agricultural services, forestry, fisheries, and goverment enterprises.

comparison, Kuznets also found a fair correspondence between his real net capital formation estimates and changes in real wealth estimates based on Census information, a chief exception being the decade 1912–22, when the sum of net capital outlays substantially exceeded the wealth increase.[80]

More pertinent for our purposes is a recent analysis by Kuznets of the difference between his net capital formation estimates and the changes in the aggregate of the industry capital estimates, used in this study, plus Kuznets' own Census-type estimates of stocks in the uncovered segments. Between 1880 and 1900 (for most of these years we pushed back the capital stock estimates by cumulating the Kuznets net capital formation estimates), the sum of Kuznets' net investment almost exactly equals the change in the sum of industry capital stocks, both expressed in 1929 dollars.[81] This correspondence is the result of offsetting discrepancies. During 1880–90, the change in industry stocks exceeded the net investment estimates by about $5 billion, and during 1890–1900 it fell short by about the same amount. During 1900–22, the stock change continued to fall somewhat below the sum of net investment. But for the entire period, 1880–1922, the discrepancy is only about $6 billion out of a total change, based on cumulated net investment, of about $147 billion. It is Kuznets' opinion that the cumulation of net investment yields better real-stock estimates, particularly for purposes of comparing changes over intermediate periods. It is with this in mind that we have used the cumulation method in going back of the Goldsmith estimates, rather than the Census estimates for 1880 and 1890.

CAPITAL WEIGHTING SYSTEM

Index numbers of real capital stocks were weighted in terms of the major sectors or industry groups shown in Table A-7. The sector stocks are unweighted, with the exception of manufacturing, in which the index numbers are a weighted average of index numbers of capital in the twenty component groups (see Appendix D). Current-dollar compensation of capital was obtained by subtracting labor compensation, including an imputed compensation for proprietors as described above, from national income originating in the several sectors in the key years beginning with 1919. Capital compensation was then divided by the index numbers of real capital stocks to get "capital compensation per unit"; these estimates were totaled for successive pairs of key years in order to obtain relative weights in the subperiods for the components of the several sectors.

This procedure parallels that used in weighting the index numbers of labor input described above. It yields the same result as that obtained by applying average rates of return of the beginning and end years of each

[80] Kuznets, *National Product since 1869*, pp. 193–99.
[81] *Capital in the American Economy*, Vol. II, Part D.

TABLE A-7

National Economy: Relative Weight of Real Capital Input, by Major Sector, Subperiods, 1919–53
(per cent)

	1919–29		*1929–37*		*1937–48*		*1948–53*	
	Weight in		*Weight in*		*Weight in*		*Weight in*	
	Sector	Total	Sector	Total	Sector	Total	Sector	Total
Manufacturing	28.2	20.0	32.0	23.8	39.4	30.1	38.3	30.8
Nonmanufacturing, non-residential	54.7	38.6	52.1	38.8	49.8	38.1	49.0	39.3
Residential	17.1	12.1	15.9	11.9	10.8	8.3	12.7	10.2
Private nonfarm	100.0		100.0		100.0		100.0	
Private nonfarm	80.0	70.7	82.9	74.5	83.1	76.5	87.2	80.3
Farm	20.0	17.7	17.1	15.4	16.9	15.6	12.8	11.8
Private domestic	100.0		100.0		100.0		100.0	
Private domestic	93.4	88.4	93.2	89.9	95.5	92.1	95.9	92.1
General government	6.6	6.3	6.8	6.6	4.5	4.3	4.1	3.9
Total domestic	100.0		100.0		100.0		100.0	
Domestic economy	94.7	94.7	96.5	96.5	96.4	96.4	96.0	96.0
Rest-of-world	5.3	5.3	3.5	3.5	3.6	3.6	4.0	4.0
National Economy	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

subperiod to the real-stock estimates themselves and then linking from 1929. Consistent with the labor weighting procedure, the 1919–29 weights were used in earlier years. The use of fixed weights, as compared with changing weights, makes a somewhat greater difference with respect to aggregate capital input measures than it does with respect to aggregate labor input, since relative rates of return on capital have varied more over time than has the wage structure. This can be seen in the Table A-7 summary of weights. The compensation per unit of nonfarm residential capital, total farm capital, and since 1929, of government capital decline relatively, while the compensation of capital in manufacturing rises relatively over the entire period.

The capital compensation estimates from 1929 forward were derived from the national income estimates of the Department of Commerce. The derivation for 1929 is illustrated in Table A-8. All of the underlying estimates are contained in the *National Income Supplement, 1954*, with two exceptions. Net rents of nonfarm residential dwellings were obtained from a special article in the June 1953 *Survey of Current Business*. The return to

TABLE A-8

National Economy: Derivation of Capital Compensation Estimates, by Major Sector, 1929

Line No.		Millions of Dollars
1	National income	87,814
2	Rest-of-world (net capital income)	810
3	Domestic income (1–2)	87,004
4	General government[a]	(5,880)
5	Labor compensation	4,335
6	Capital compensation[a]	(1,545)
7	Private domestic income (3–5)	82,669
8	Farm income[b]	8,569
9	Labor compensation[c]	5,206
10	Capital compensation[b] (8–9)	3,363
11	Private nonfarm domestic income (7–8)	74,100
12	Manufacturing	21,888
13	Labor compensation[c]	16,464
14	Capital compensation (12–13)	5,424
15	Residential (capital compensation)	3,650
16	Nonmanufacturing, nonresidential (11–12–15)	48,562
17	Labor compensation[c]	38,079
18	Capital compensation (16–17)	10,483

[a] Compensation of general-government capital is not included in the Commerce Department national income total shown in line 1.

[b] Includes net rents paid to nonfarm landlords.

[c] Includes an imputed compensation for manhours worked by proprietors and unpaid family workers.

general-government capital, not included in the national accounts, was obtained by applying the average rate of interest paid on the public debt to our estimates of the current-dollar value of the stock of public capital. The average rate was obtained by dividing monetary interest paid by governments (*National Income Supplement, 1954*, Table 37) by the gross interest-bearing debt of federal, state, and local governments (*Survey of Current Business*, September 1953 and May 1956). The labor compensation estimates are higher than the published "employee compensation" estimates by the amount of imputed compensation for the labor of proprietors and their families.

The Commerce estimates for the private nonfarm domestic economy were extrapolated back from 1929 to 1919 by the estimates of Kuznets contained in *National Income and Its Composition, 1919–1938.* Kuznets' wage-salary estimates were adjusted for comparability with our estimates of employment by multiplying them by the ratio of our employment estimates to his. They were further adjusted to include estimated compensation of proprietors and unpaid family workers and then used to extrapolate the 1929 labor compensation estimates. National income in 1919 was obtained by extrapolating the 1929 ratio to labor compensation by similar ratios obtained from the Kuznets estimates for 1919 and 1929. Manufacturing was treated similarly. The return to residential capital was computed by applying the 1929 rate of return to the current-dollar value of residential real estate in 1919. The estimate for the nonmanufacturing, nonresidential sector was obtained as a residual, in line with the procedure for 1929 and subsequent years.

Total national income was built up by adding estimates for the other sectors, derived as follows: Farm national income was estimated from recent Agricultural Department publications (see Appendix B); compensation of general-government employees was estimated as described in Appendix K; government capital compensation, by applying the 1929 rate of return to the current-dollar value of assets in 1919; net property income from abroad in 1919 was available from the Commerce Department.

The real capital input estimates obtained by sector weighting of the capital stocks show a greater increase between 1869 and 1957 than do the unweighted aggregate real-stock figures. Table A-9 indicates that the weighted series rises by almost 10 per cent more than the unweighted over the period as a whole. The result is in the same direction as that shown by weighted labor input in relation to unweighted manhours, but to a lesser degree. This may be due in part to the fact that the labor inputs were weighted in somewhat greater detail than the capital inputs—forty-seven groups compared with twenty-five.

It will be noted from Table A-9 that weighted capital declined relative to unweighted capital between 1869 and 1889. This is due primarily to a

large relative increase in residential real estate, which has the lowest relative rate of return of the various sectors or groups.

TABLE A-9

National Economy: Comparison of Weighted and Unweighted Real Capital Input, Key Years, 1869–1957
(1929 = 100)

	Capital Input		*Ratio of Weighted to Unweighted*
	Weighted by Sector[a]	Unweighted	
1869	11.6	11.8	0.983
1879	17.4	18.0	0.967
1889	25.5	27.4	0.931
1899	38.7	41.6	0.930
1909	55.7	57.9	0.962
1919	76.7	74.8	1.025
1929	100.0	100.0	1.000
1937	95.3	97.9	0.973
1948	115.6	112.3	1.029
1953	141.6	133.6	1.060
1957	160.4	151.0	1.062

[a] Marshall-Edgeworth weights, as described in text.

Total Factor Input

Two approaches to the measurement of total input are possible. First, total capital input may be combined with total labor input. In this case the relative weights are obtained from the quotients of total capital compensation and the index of weighted capital stocks, and of total labor compensation and the index of weighted manhours; estimation of factor compensation has already been described. The results of this method are shown in Table A-10.

Alternatively, total inputs in the various sectors may be combined. In this case relative weights are obtained by dividing total factor compensation in each sector by the index of weighted input. That these two methods result in the same total input indexes is illustrated in Table A-11 for the two subperiods that link automatically on a 1929 basis.

As when combining the various types of each of the inputs, changing weights based on the Marshall-Edgeworth formula were used to combine the input classes for each of the subperiods, and the subperiod relatives were linked forward and backward from the 1929 base. The system of changing weights results in a somewhat larger increase in input for the national economy prior to 1929 than does the use of fixed 1929 weights

(see Table A-XVII). This is the result of the inverse relation between relative factor weights and relative factor inputs. The use of 1929 weights should give a larger increase in total input since 1929 than the use of changing weights; but the tendency is not marked, as the table shows. Between 1937 and 1948 capital input did not grow as rapidly as labor input, while capital compensation per unit temporarily reversed its downward trend in relation to average hourly labor compensation. But after 1948, relative capital inputs increased, and the relative price of capital declined; so recent weights yield a lesser increase in total real input than is obtained using 1929 weights.

TABLE A-10

National Economy: Relative Weights of Labor and Capital Inputs, by Major Sectors, Subperiods, 1899–1953
(per cent)

	NATIONAL ECONOMY		PRIVATE DOMESTIC ECONOMY					
	Labor	*Capital*	*Total*		*Nonfarm*		*Farm*	
			Labor	Capital	Labor	Capital	Labor	Capital
1899–1909	64	36	65	35	63	37	63	37
1909–19	67	33	68	32	71	29	56	44
1919–29	70	30	71	29	74	26	57	43
1929–37	75	25	76	24	78	22	60	40
1937–48	77	23	78	22	78	22	71	29
1948–53	79	21	79	21	79	21	79	21

One cannot speak strictly of an "unweighted input" index, since manhours and capital are not additive without the use of a common denominator. But, the combination of unweighted real capital stocks and unweighted manhours by their relative unit compensation in 1929 represents the minimum weighting possible. This total input measure increases far less than either of the indexes using internal weights for each of the factor classes (see Table A-XVII, columns 3 and 5). The ratios of weighted to unweighted indexes reflect the relative shift of inputs to higher-paying uses, which was pointed out in connection with labor and capital inputs separately.

The indexes of factor input are shown for the national and private domestic economies annually, and in other sectors for key years, in the productivity summary tables, A-XIX through A-XXIII.

The Productivity Ratios

Having described the nature and derivation of the real-product and factor input measures, little remains to be said about the productivity index numbers shown in the tables at the end of this appendix. The indexes

TABLE A-11

National Economy: Alternative Methods of Weighting Inputs, by Major Sector, Key Years and Subperiods, 1919–37

	Total Input	*Input by Type*		*Input by Sector*			
		Labor	Capital	Private Nonfarm	Farm	Government	Rest-of-world
				WEIGHTS (PER CENT)			
1919–29		70	30	80	12	6	2
1929–37		75	25	83	9	7	1
				INDEX (1929 = 100)			
1919	85.1	88.7	76.7	82.3	102.0	103.8	32.3
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1937	92.8	92.0	95.3	88.2	95.6	151.5	42.3

were computed from ratios of real product to the corresponding partial and total factor input measures in each of the several broad sectors of the economy distinguished in this study.

CONSISTENCY OF OUTPUT AND INPUT WEIGHTING SCHEMES

The real-product series in index form (Tables A-XIX to A-XXII) do not show the same movement as the real-product series expressed in constant-dollar aggregates (Tables A-I to A-III). This results from different systems of weights. The various types of goods and services comprising the constant-dollar product estimates are weighted by 1929 prices. The indexes, on the other hand, are based on a reweighting of the goods and services produced in the private domestic sector for each of the subperiods by average prices in the terminal years in accordance with the Marshall-Edgeworth formula (see Table A-XVIII for the reweighting effects in key years).

The index numbers of manhours are wholly unweighted, whereas those of labor input represent manhours in the various industry groups and segments weighted by the mean of average hourly earnings in the bounding years of each subperiod beginning with 1919; manhours in the earlier years are weighted by the average of 1919–29 average hourly earnings. The same time-pattern of weights is used in obtaining capital input. That is, average unit capital compensation weights were calculated for subperiods beginning with 1919 and applied to the index numbers of real capital stock in the various industry groups and sectors.

A superficial inconsistency in the weighting procedure for product and the two input classes will be noted. The Marshall-Edgeworth weights for product were changed each subperiod (and the real-product estimates linked) back to 1889–99, whereas reliable weights for the two input classes could not be obtained prior to 1919–29. This is probably not important, however, since the use of changing weights as compared with fixed weights makes little difference in the movement of capital input and even less in that of labor. In combining labor and capital inputs, weights have been changed in subperiods back to 1899–1909; this is more consistent with the product weighting procedure.

The use of changing, as compared with fixed, weights makes somewhat less difference in the movement of the productivity indexes than it does in the movement of real product. That is, the movement of the ratio of the input aggregate using changing weights to that using fixed weights is in the same direction as the comparable ratio of the two real-product aggregates, but to a lesser extent (see Table A-XVIII). This is true not only of the long period, 1869 or 1899 to 1953, but also of all the subperiods with the exception of 1948–53. In general, the effect of alternative weighting systems on productivity movements is not marked in relation to the

total movement of the series over the long period and each subperiod. One exception is the decade 1909–19, in which contemporary weights yield about a 4 per cent greater increase in real product and productivity than 1929 weights. But that larger increase merely serves to put the rate of productivity change in 1909–19 in line with the growth rate in the two earlier decades.

RELIABILITY OF THE PRODUCTIVITY RATIOS

In appraising the reliability of the productivity ratios, one must keep in mind the various limitations attaching to both the output and input measures. It is not true, however, that the productivity ratios are no better than their component parts. If errors in the numerator and the denominator are in an opposite direction, the effect on the ratios is magnified. However, it is likely that errors in output and input measures are in the same direction and therefore offsetting. Many of the output and input estimates for the economy and its industrial divisions are based on the same basic source materials. Thus, varying degrees of coverage, and response, and certain other reporting errors would tend to affect both outputs and inputs similarly. The very fact that the productivity series, whether based on real-product or on industry aggregates, tend to exhibit rather regular secular movements and to yield significant analytical results, is a pragmatic indication of the broad reliability of the estimates. There is, however, no direct means of measuring the probable margins of error of the estimates (see Chapter 2).

THE PRODUCTIVITY SUMMARY TABLES

Tables A-XIX through A-XXV, following this section, give index numbers of the partial and total factor productivity ratios and the underlying variables for the national economy, using the three chief concepts of national product discussed earlier; the private domestic economy; the private domestic nonfarm economy; the sector for which output can be derived as a weighted aggregate of industry output indexes; and the somewhat smaller sector in which industry capital as well as output and labor input indexes are available.

Of the three national economy tables (A-XIX, XX, and XXI), only the one based on the national security version of the Kuznets estimates is given annually, since this is the preferred concept and underlies the analysis of Chapter 4. The other two tables are for key years; and the input index numbers are not repeated since these are the same throughout—the only variation among the three tables is in the concept of national product. National product is shown net of capital consumption allowances (without allowance for depreciation of munitions, however), since this is appropriate for the purposes for which the national economy series

are used—temporal comparisons of material well-being. Factors permitting adjustment of net product and derived productivity indexes to a basis gross of capital consumption are provided for those who are interested in this form of data. Likewise, in Table XXI, factors are provided that permit conversion of the national economy measures to a domestic basis.

Table XXII, giving estimates for the private domestic economy, Commerce concept, is also on an annual basis since this is the series used for detailed examination of temporal productivity changes because of its presumed greater accuracy. The product estimates in this sector are gross of capital consumption, partly because annual changes in gross measures are more meaningful than annual changes in net measures, and partly because they are used for comparison with the industry estimates, which are likewise gross. The farm and nonfarm components of the private domestic economy may be found in Tables B-I and A-XXIII.

The two industry aggregate summaries (Tables A-XXIV and A-XXV) are for key years only, since they are used chiefly as broad confirmations of the general movements revealed by the aggregate private domestic economy measures.

One further note, which will refer to all index numbers in this volume, is necessary. Due to the use of changing weights for different periods in a time series and the method of linking the several segments into a continuous series, indexes for totals may not be averages of the linked component indexes. For example, the index number for total gas utilities output in 1909 relative to 1929 is 37.5, which lies outside the range of the index numbers of 38.0 and 38.1 for manufactured and natural gas outputs, respectively. For another example, the index number of total factor productivity in the metal mining group in 1953 is higher than the index numbers of the two partial productivity ratios (see Table C-III).

TABLE A-I

Gross and Net National Product, Adjusted Kuznets Concepts,
Peacetime and National Security Versions, 1869–1957
(millions of 1929 dollars)

	Gross National Product (1)	*Capital Consumption*[a] (2)	*Net National Product* (1) − (2) (3)	*Gross War Construction and Munitions* (4)	*National Security Outlays* (5)	*National Product: National Security Version* Gross (1) − (4) + (5) (6)	Net (6) − (2) (7)	*Addendum: National Security Outlays* (current dollars) (8)
1869–78[b]	10,755	995	9,760		73	10,828	9,833	59
1879–88[b]	20,149	1,926	18,223		81	20,230	18,304	47
1889	23,284	2,651	20,633		97	23,381	20,730	54
1890	25,042	2,817	22,225		101	25,143	22,326	56
1891	26,200	2,983	23,217		104	26,304	23,321	58
1892	28,783	3,135	25,648		112	28,895	25,760	62
1893	27,306	3,274	24,032		118	27,424	24,150	64
1894	26,351	3,378	22,973		119	26,470	23,092	62
1895	29,744	3,475	26,269		110	29,854	26,379	58
1896	29,104	3,593	25,511		121	29,225	25,632	63
1897	31,855	3,727	28,128		179	32,034	28,307	91
1898	32,255	3,859	28,396		440	32,695	28,836	217
1899	35,443	3,999	31,444		413	35,856	31,857	216
1900	36,574	4,140	32,434		338	36,912	32,772	174
1901	40,931	4,288	36,643		324	41,255	36,967	166
1902	41,337	4,447	36,890		317	41,654	37,207	168
1903	43,391	4,628	38,763		328	43,719	39,091	179
1904	42,836	4,803	38,033		368	43,204	38,401	205
1905	45,947	4,983	40,964		360	46,307	41,324	205
1906	51,544	5,214	46,330		333	51,877	46,663	190
1907	52,201	5,486	46,715		328	52,529	47,043	194
1908	47,203	5,726	41,477		391	47,594	41,868	232
1909	53,615	5,920	47,695		393	54,008	48,088	241

(continued)

TABLE A-I (continued)

1910	54,263	6,158	48,105		385	54,648	48,490	239
1911	55,341	6,402	48,939		403	55,744	49,342	242
1912	58,171	6,637	51,534		393	58,564	51,927	240
1913	60,828	6,886	53,942		405	61,233	54,347	252
1914	55,755	7,109	48,646	205	558	56,108	48,999	322
1915	57,434	7,285	50,149	182	542	57,794	50,509	319
1916	66,356	7,489	58,867	277	716	66,795	59,306	460
1917	64,692	7,754	56,938	1,882	3,287	66,097	58,343	2,530
1918	63,640	8,019	55,621	3,854	12,610	72,396	64,377	12,730
1919	70,271	8,650	61,621	2,215	7,337	75,393	66,743	8,283
1920	71,383	8,603	62,780	430	1,739	72,692	64,089	2,241
1921	68,355	8,183	60,172	334	1,377	69,398	61,215	1,481
1922	73,150	8,663	64,487	145	829	73,834	65,171	818
1923	82,994	8,905	74,089	89	741	83,646	74,741	735
1924	85,222	9,043	76,179	103	732	85,851	76,808	697
1925	87,359	9,407	77,952	111	703	87,951	78,544	690
1926	93,438	10,086	83,352	104	683	94,017	83,931	688
1927	94,161	10,163	83,998	112	701	94,750	84,587	697
1928	95,715	10,592	85,123	174	796	96,337	85,745	789
1929	101,444	10,994	90,450	190	843	102,097	91,103	843
1930	91,513	10,902	80,611	203	903	92,213	81,311	869
1931	84,300	10,662	73,638	324	958	84,934	74,272	908
1932	70,682	10,246	60,436	349	910	71,243	60,997	826
1933	68,337	9.960	58,377	287	840	68,890	58,930	708
1934	74,609	9,995	64,614	407	974	75,176	65,181	862
1935	85,806	10,188	75,618	457	1,046	86,395	76,207	951
1936	95,798	10,563	85,235	614	1,299	96,483	85,920	1,205
1937	103,917	10,884	93,033	550	1,263	104,630	93,746	1,189
1938	96,670	10,923	85,747	607	1,414	97,477	86,554	1,328
1939	103,736	11,086	92,650	400	1,173	104,509	93,423	1,258

(continued)

TABLE A-I (concluded)

Gross and Net National Product, Adjusted Kuznets Concepts,
Peacetime and National Security Versions, 1869–1957
(millions of 1929 dollars)

	Gross National Product (1)	*Capital Consumption*[a] (2)	*Net National Product* (1) − (2) (3)	*Gross War Construction and Munitions* (4)	*National Security Outlays* (5)	*National Product: National Security Version* Gross (1) − (4) + (5) (6)	Net (6) − (2) (7)	*Addendum: National Security Outlays* (current dollars) (8)
1940	112,961	11,401	101,560	626	2,311	114,646	103,245	2,223
1941	126,237	12,457	113,780	2,822	11,131	134,546	122,089	13,794
1942	122,571	13,934	108,637	10,537	39,992	152,026	138,092	49,567
1943	121,918	14,785	107,133	16,316	62,208	167,810	153,025	80,384
1944	126,633	15,907	110,726	17,684	71,206	180,155	164,248	88,615
1945	130,218	16,217	114,001	12,098	60,917	179,037	162,820	75,923
1946	151,895	14,658	137,237	2,311	14,207	163,791	149,133	21,188
1947	153,515	16,558	136,957	1,341	8,124	160,298	143,740	13,349
1948	158,828	18,012	140,816	1,478	9,828	167,178	149,166	15,984
1949	153,970	19,014	134,956	1,585	11,579	163,964	144,950	19,288
1950	172,756	19,849	152,907	1,565	10,247	181,438	161,589	18,511
1951	178,565	21,201	157,364	3,821	19,059	193,803	172,602	37,260
1952	180,234	20,696	159,538	5,795	25,956	200,395	179,699	48,823
1953	184,993	21,776	163,217	6,287	28,455	207,161	185,385	51,475
1957[p]	210,574	25,593	184,981	3,794	21,006	227,786	202,193	46,473

[p] = preliminary.

[a] This is the series presented by Simon Kuznets in *Capital in the American Economy: Its Formation and Financing*, New York (NBER), in press, except that no allowance has been made for depreciation of durable munitions.

[b] Annual average for decade.

TABLE A-IIa

Gross National Product, Commerce Concept, Derivation from Kuznets Estimates[a], 1869–1957
(millions of 1929 dollars)

	CONSUMPTION EXPENDITURES				GROSS PRIVATE DOMESTIC INVESTMENT				NET FOREIGN INVESTMENT[b]	GOVERNMENT PURCHASES OF GOODS AND SERVICES	GROSS NATIONAL PRODUCT, COMMERCE CONCEPT
	Total, Kuznets Estimates	*Personal Tax and Nontax Payments*	*Unpaid Services of Financial Intermediaries*	*Total, Commerce Basis* (1) − (2) + (3)	*New Construction and Equipment* Kuznets Estimates	Public Investment	Commerce Basis (5) − (6)	*Change in Business Inventories*			(4) + (7) + (8) + (9) + (10)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1869–78[c]	8,284	136	66	8,214	2,147	222	1,925	445	−122	1,001	11,463
1879–88[c]	15,662	236	143	15,569	4,019	408	3,611	544	− 76	1,400	21,048
1889	18,063	270	211	18,004	5,009	523	4,486	383	−171	1,689	24,391
1890	18,012	281	224	17,955	6,776	545	6,231	479	−225	1,756	26,196
1891	19,319	307	235	19,247	6,495	588	5,907	438	−52	1,825	27,365
1892	20,215	321	263	20,157	8,112	624	7,488	566	−110	1,909	30,010
1893	20,334	336	258	20,256	6,854	635	6,219	201	− 83	1,976	28,569
1894	19,697	314	276	19,659	6,470	583	5,887	180	4	2,026	27,756
1895	22,184	355	290	22,119	7,050	646	6,404	788	−278	2,049	31,082
1896	22,122	350	284	22,056	6,433	699	5,734	354	195	2,105	30,444
1897	23,887	388	295	23,794	6,856	659	6,197	799	313	2,224	33,327
1898	24,268	410	335	24,193	6,538	691	5,847	558	891	2,579	34,068
1899	27,130	469	392	27,053	6,635	776	5,859	1,117	561	2,582	37,172
1900	27,384	494	406	27,296	7,636	868	6,768	723	831	2,579	38,197
1901	30,744	554	461	30,651	8,373	903	7,470	1,135	679	2,652	42,587
1902	31,005	578	484	30,911	9,399	989	8,410	632	301	2,750	43,004
1903	32,883	608	486	32,761	9,379	1,149	8,230	689	440	3,003	45,123
1904	33,282	615	521	33,188	8,943	1,182	7,761	318	293	2,999	44,559

(continued)

TABLE A-IIa (continued)

Gross National Product, Commerce Concept, Derivation from Kuznets Estimates[a], 1869–1957
(millions of 1929 dollars)

	CONSUMPTION EXPENDITURES				GROSS PRIVATE DOMESTIC INVESTMENT				NET FOREIGN INVESTMENT[b]	GOVERNMENT PURCHASES OF GOODS AND SERVICES	GROSS NATIONAL PRODUCT, COMMERCE CONCEPT
	Total, Kuznets Estimates	*Personal Tax and Nontax Payments*	*Unpaid Services of Financial Intermediaries*	*Total, Commerce Basis* (1) − (2) + (3)	*New Construction and Equipment* Kuznets Estimates	Public Investment	Commerce Basis (5) − (6)	*Change in Business Inventories*			(4) + (7) + (8) + (9) + (10)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1905	35,138	633	585	35,090	9,682	1,252	8,430	817	310	3,223	47,870
1906	38,995	633	603	38,965	10,992	1,376	9,616	1,283	274	3,282	53,420
1907	39,742	659	619	39,702	11,586	1,524	10,062	663	210	3,640	54,277
1908	37,243	681	635	37,197	9,943	1,452	8,491	−400	417	4,085	49,790
1909	41,267	698	700	41,269	11,229	1,481	9,748	1,395	−276	3,757	55,893
1910	42,057	723	700	42,034	11,595	1,639	9,956	875	−264	3,898	56,499
1911	44,051	727	740	44,064	10,500	1,628	8,872	706	84	4,586	58,312
1912	45,198	727	740	45,211	11,741	1,714	10,027	1,159	73	4,588	61,058
1913	46,717	787	771	46,701	12,684	1,813	10,871	1,158	269	4,476	63,475
1914	46,124	804	804	46,124	9,786	1,968	7,818	27	−182	4,849	58,636
1915	45,333	833	822	45,322	9,406	2,014	7,392	229	2,466	5,015	60,424
1916	49,447	956	917	49,408	11,226	2,180	9,046	1,667	4,016	4,733	68,870
1917	49,177	1,733	898	48,342	11,428	3,572	7,856	486	3,601	6,979	67,264
1918	49,595	2,294	820	48,121	11,465	5,314	6,151	529	2,051	16,509	73,361
1919	52,205	2,783	823	50,245	11,749	3,880	7,869	2,865	3,502	9,677	74,158
1920	54,160	2,234	787	52,713	10,726	2,279	8,447	4,313	2,284	5,556	73,313
1921	56,970	1,706	818	56,082	9,891	2,330	7,561	−122	1,536	6,526	71,583
1922	59,240	2,020	929	58,149	12,944	2,571	10,373	253	653	6,360	75,788
1923	64,265	1,820	982	63,427	15,435	2,632	12,803	2,775	469	6,345	85,819
1924	68,979	1,908	1,056	68,127	16,193	2,857	13,336	−984	984	6,898	88,361
1925	67,064	2,047	1,120	66,137	18,022	3,253	14,769	1,602	671	7,350	90,529
1926	72,514	2,121	1,155	71,548	19,312	3,406	15,906	1,157	435	7,359	96,405
1927	74,240	2,320	1,237	73,157	18,785	3,591	15,194	378	718	7,890	97,337
1928	76,321	2,796	1,288	74,813	18,763	3,867	14,896	−417	1,008	8,203	98,503
1929	80,317	2,643	1,278	78,952	18,678	4,121	14,557	1,674	771	8,482	104,436

(continued)

TABLE A-IIa (concluded)

1930	75,897	2,620	1,388	74,665	15,428	4,417	11,011	−558	577	9,435	95,130
1931	73,168	2,076	1,425	72,517	11,579	4,110	7,469	−717	220	9,965	89,454
1932	66,371	1,766	1,420	66,025	7,318	3,210	4,108	−3,268	55	9,483	76,403
1933	65,008	1,931	1,489	64,566	6,370	2,678	3,692	−3,348	−147	9,415	74,178
1934	68,590	2,113	1,493	67,970	8,096	3,521	4,575	−2,790	102	10,924	80,781
1935	73,108	2,491	1,670	72,287	9,881	3,651	6,230	2,551	−605	10,972	91,435
1936	80,750	2,925	1,827	79,652	14,123	5,544	8,579	717	−730	12,689	100,907
1937	84,429	3,656	1,851	82,624	14,717	4,675	10,042	4,544	−447	12,349	109,112
1938	83,022	3,542	1,851	81,331	12,963	5,164	7,799	−957	1,060	13,999	103,232
1939	87,006	3,020	1,896	85,882	14,788	5,480	9,308	638	797	14,369	110,994
1940	91,662	3,203	2,012	90,471	16,201	5,073	11,128	3,109	1,238	15,062	121,008
1941	97,865	3,468	2,021	96,418	21,007	7,945	13,062	5,819	397	23,002	138,698
1942	96,165	3,609	2,106	94,662	24,157	16,719	7,438	2,391	−1,056	51,221	154,656
1943	98,755	3,842	2,386	97,299	26,006	20,363	5,643	−957	−3,170	71,391	170,206
1944	102,155	4,015	3,086	101,226	27,113	20,105	7,008	−1,036	−3,120	79,506	183,584
1945	109,052	4,337	3,886	108,601	23,531	13,932	9,599	−1,275	−2,434	66,448	180,939
1946	122,298	4,980	3,623	120,941	19,705	4,425	15,280	6,218	3,073	20,093	165,605
1947	124,925	5,212	2,858	122,571	23,118	4,065	19,053	−797	5,759	17,548	164,134
1948	127,542	5,299	2,882	125,125	25,879	4,967	20,912	4,065	1,067	21,852	173,021
1949	130,700	5,235	3,004	128,469	25,667	6,218	19,449	−2,790	159	25,350	170,637
1950	138,723	5,499	3,075	136,299	29,825	6,540	23,285	5,580	−1,186	23,433	187,411
1951	139,780	5,665	3,060	137,175	32,369	9,458	22,911	6,218	1,079	32,036	199,419
1952	143,967	5,739	3,130	141,358	34,557	11,834	22,723	1,754	798	39,167	205,800
1953	149,989	5,803	3,359	147,545	36,335	12,576	23,759	−239	−141	43,040	213,964
1957[p]	171,926	6,505	4,524	169,945	36,728	10,461	26,267	677	933	38,180	236,002

[p] = preliminary.

[a] Using Kuznets, statistical variant III, *Capital in the American Economy: Its Formation and Financing*, New York (NBER), in press.

[b] For 1929 and prior years, the estimates are those prepared by Kuznets, although his method of deflation differs from that of the Commerce Department (see text). After 1929, the estimates are those of the Department.

[c] Annual average for decade.

TABLE A-IIb

Gross National Product, Commerce Concept, Derivation from Kuznets Estimates, 1869–1929; and Reconciliation with Kuznets Estimates, 1937, 1948, and 1953
(millions of current dollars)

	CONSUMPTION EXPENDITURES				GROSS PRIVATE DOMESTIC INVESTMENT				NET FOREIGN INVESTMENT	GOVERNMENT PURCHASES OF GOODS AND SERVICES	GROSS NATIONAL PRODUCT, COMMERCE CONCEPT
	Total, Kuznets Estimates	*Personal Tax and Nontax Payments*	*Unpaid Services of Financial Intermediaries*	*Total, Commerce Basis* (1) − (2) + (3)	*New Construction and Equipment* Kuznets Estimates	Public Investment	Commerce Basis (5) − (6)	*Change in Business Inventories*			(4) + (7) + (8) + (9) + (10)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1869–78[a]	5,777	86	38	5,729	1,163	133	1,030	361	−94	383	7,409
1879–88[a]	8,780	132	77	8,725	1,887	202	1,685	349	−40	492	11,211
1889	9,737	146	103	9,694	2,272	245	2,027	231	−90	623	12,485
1890	9,549	150	113	9,512	3,042	254	2,788	283	−115	661	13,129
1891	10,108	162	122	10,068	2,795	258	2,537	257	−26	694	13,530
1892	10,218	167	115	10,166	3,396	268	3,128	310	−53	722	14,273
1893	10,487	174	134	10,447	2,843	269	2,574	113	−41	756	13,849
1894	9,465	160	112	9,417	2,596	240	2,356	91	2	753	12,619
1895	10,439	180	111	10,370	2,764	256	2,508	403	−126	773	13,928
1896	10,080	176	124	10,028	2,475	266	2,209	173	86	799	13,295
1897	10,933	195	113	10,851	2,656	264	2,392	391	139	844	14,617
1898	11,407	206	114	11,315	2,641	294	2,347	284	408	1,034	15,388
1899	12,917	238	118	12,797	2,943	360	2,583	612	266	1,098	17,356
1900	13,731	256	155	13,630	3,506	414	3,092	426	412	1,124	18,684
1901	15,334	291	148	15,191	3,762	425	3,337	658	334	1,148	20,668
1902	16,043	309	179	15,913	4,337	477	3,860	391	153	1,237	21,554
1903	17,109	330	194	16,973	4,371	549	3,822	431	225	1,413	22,864
1904	17,651	339	207	17,519	4,177	563	3,614	199	152	1,366	22,850
1905	18,980	354	208	18,834	4,689	615	4,074	516	165	1,527	25,116
1906	21,279	358	236	21,157	5,670	707	4,963	831	149	1,620	28,720
1907	22,667	380	265	22,552	6,206	817	5,389	453	119	1,891	30,404
1908	21,354	397	270	21,227	5,141	748	4,393	−264	235	2,108	27,699
1909	24,372	416	281	24,237	5,965	788	5,177	989	−161	1,924	32,166

(continued)

TABLE A-IIb (concluded)

1910	25,564	442	331	25,453	6,267	890	5,377	647	−158	2,041	33,360
1911	26,498	453	351	26,396	5,781	904	4,877	481	50	2,464	34,268
1912	28,398	465	373	28,306	6,553	962	5,591	840	45	2,529	37,311
1913	29,466	513	418	29,371	7,241	1,042	6,199	848	167	2,482	39,067
1914	29,542	542	436	29,436	5,519	1,114	4,405	19	−114	2,678	36,424
1915	29,977	588	447	29,836	5,527	1,198	4,329	167	1,598	2,808	38,738
1916	36,715	715	483	36,483	7,414	1,492	5,922	1,495	2,952	2,916	49,768
1917	45,116	1,395	538	44,259	9,392	2,961	6,431	599	3,295	5,361	59,945
1918	52,027	1,966	640	50,701	11,714	5,354	6,360	729	2,190	16,196	76,176
1919	54,659	2,193	794	53,260	12,590	4,277	8,313	4,054	3,824	9,456	78,907
1920	63,671	2,044	997	62,624	13,029	2,906	10,123	7,361	2,844	5,904	88,856
1921	58,931	1,692	969	58,208	10,384	2,631	7,753	63	1,613	6,301	73,938
1922	58,425	2,000	891	57,316	12,155	2,608	9,547	530	645	5,952	73,990
1923	64,645	1,824	946	63,767	15,537	2,844	12,693	2,992	477	6,186	86,115
1924	68,620	1,942	964	67,642	16,233	3,066	13,167	−936	987	6,701	87,561
1925	68,279	2,098	1,026	67,207	17,815	3,406	14,409	1,752	684	7,256	91,308
1926	74,044	2,172	1,076	72,948	18,979	3,498	15,481	1,523	445	7,297	97,694
1927	73,883	2,362	1,081	72,602	18,363	3,673	14,690	407	716	7,864	96,279
1928	76,528	2,818	1,181	74,891	18,336	3,880	14,456	−379	1,012	8,184	98,164
1929	80,317	2,643	1,278	78,952	18,678	4,121	14,557	1,674	771	8,482	104,436
1937	69,304	2,921	876	67,259	14,110	4,612	9,498	2,249	62	11,712	90,780
1948	182,231	6,332	1,710	177,609	45,675	8,661	37,014	4,162	1,956	36,584	257,325
1953	235,943	8,199	2,798	230,542	74,281	24,210	50,071	254	−2,017	84,368	363,218
1953[r]				232,649			49,893	447	−2,017	84,413	365,385
1957[p]				284,442			64,339	953	3,462	87,132	440,328

[a] Annual average for decade.
[p] = preliminary.
[r] = revised (*U.S. Income and Output, 1958 Supplement, Survey of Current Business*, Dept. of Commerce).

TABLE A-III

National Product, Commerce Concept, by Sector, 1869–1957
(millions of 1929 dollars)

	Gross National Product (1)	Capital Consumption Allowances (2)	Net National Product (1) – (2) (3)	Net Factor Income from Abroad (4)	Gross Domestic Product (1) – (4) (5)	Government Product (6)	Gross Private Domestic Product (5) – (6) (7)	Addendum: Farm Gross Product[a] (8)
1869–78[b]	11,463	877	10,586	—113	11,576	695	10,881	4,289
1879–88[b]	21,048	1,724	19,324	—143	21,191	954	20,237	6,002
1889	24,391	2,388	22,003	—190	24,581	1,124	23,457	6,824
1890	26,196	2,540	23,656	—203	26,399	1,148	25,251	6,715
1891	27,365	2,691	24,674	—198	27,563	1,171	26,392	6,987
1892	30,010	2,829	27,181	—198	30,208	1,203	29,005	6,635
1893	28,569	2,954	25,615	—189	28,758	1,235	27,523	6,464
1894	27,756	3,046	24,710	—193	27,949	1,272	26,677	6,689
1895	31,082	3,131	27,951	—198	31,280	1,301	29,979	7,112
1896	30,444	3,236	27,208	—213	30,657	1,322	29,335	7,627
1897	33,327	3,355	29,972	—252	33,579	1,347	32,232	8,198
1898	34,068	3,472	30,596	—236	34,304	1,549	32,755	8,561
1899	37,172	3,595	33,577	—217	37,389	1,526	35,863	8,557
1900	38,197	3,719	34,478	—200	38,397	1,575	36,822	8,637
1901	42,587	3,848	38,739	—179	42,766	1,632	41,134	8,583
1902	43,004	3,989	39,015	—157	43,161	1,662	41,499	8,514
1903	45,123	4,146	40,977	—141	45,264	1,697	43,567	8,772
1904	44,559	4,298	40,261	—137	44,696	1,753	42,943	9,001
1905	47,870	4,453	43,417	—130	48,000	1,822	46,178	9,107
1906	53,420	4,657	48,763	—114	53,534	1,899	51,635	9,594
1907	54,277	4,897	49,380	—116	54,393	1,986	52,407	9,162
1908	49,790	5,104	44,686	—126	49,916	2,088	47,828	9,342
1909	55,893	5,268	50,625	—110	56,003	2,187	53,816	9,152

(continued)

TABLE A-III (continued)

1910	56,499	5,473	51,026	—107	56,606	2,285	54,321	9,411
1911	58,312	5,681	52,631	—128	58,440	2,365	56,075	8,880
1912	61,058	5,879	55,179	—120	61,178	2,454	58,724	10,498
1913	63,475	6,092	57,383	—118	63,593	2,523	61,070	9,133
1914	58,636	6,276	52,360	—88	58,724	2,642	56,082	10,196
1915	60,424	6,413	54,011	99	60,325	2,737	57,588	10,912
1916	68,870	6,577	62,293	180	68,690	2,802	65,888	9,595
1917	67,264	6,786	60,478	273	66,991	3,710	63,281	10,586
1918	73,361	6,958	66,403	328	73,033	7,056	65,977	9,612
1919	74,158	7,463	66,695	539	73,619	4,960	68,659	9,674
1920	73,313	7,380	65,933	382	72,931	3,655	69,276	9,542
1921	71,583	6,950	64,633	324	71,259	3,580	67,679	8,981
1922	75,788	7,365	68,423	572	75,216	3,537	71,679	9,595
1923	85,819	7,565	78,254	699	85,120	3,589	81,531	10,246
1924	88,361	7,661	80,700	620	87,741	3,739	84,002	9,718
1925	90,529	7,959	82,570	727	89,802	3,888	85,914	10,433
1926	96,405	8,546	87,859	735	95,670	3,976	91,694	10,328
1927	97,337	8,569	88,768	743	96,594	4,114	92,480	10,647
1928	98,503	8,912	89,591	802	97,701	4,198	93,503	10,406
1929	104,436	9,232	95,204	810	103,626	4,335	99,291	10,729

(continued)

TABLE A-III (continued)

	Gross National Product (1)	Capital Consumption Allowances (2)	Net National Product (1) − (2) (3)	Net Factor Income from Abroad (4)	Gross Domestic Product (1) − (4) (5)	Government Product (6)	Gross Private Domestic Product (5) − (6) (7)	Addendum: Farm Gross Product[a] (8)
1930	95,130	9,060	86,070	768	94,362	4,554	89,808	9,991
1931	89,454	8,742	80,712	627	88,827	4,630	84,197	11,176
1932	76,403	8,281	68,122	506	75,897	4,536	71,361	10,696
1933	74,178	7,961	66,217	420	73,758	4,988	68,770	10,998
1934	80,781	7,951	72,830	368	80,413	5,900	74,513	9,472
1935	91,435	8,084	83,351	455	90,980	6,315	84,665	10,444
1936	100,907	8,377	92,530	359	100,548	7,517	93,031	9,753
1937	109,112	8,623	100,489	335	108,777	6,966	101,811	10,927
1938	103,232	8,638	94,594	457	102,775	7,611	95,164	11,421
1939	110,994	8,774	102,220	373	110,621	7,639	102,982	11,452
1940	121,008	9,010	111,998	420	120,588	7,909	112,679	11,366
1941	138,698	9,883	128,815	398	138,300	9,574	128,726	12,311
1942	154,656	11,038	143,618	353	154,303	13,671	140,632	13,198
1943	170,206	11,628	158,578	326	169,880	21,015	148,865	12,591
1944	183,584	12,583	171,001	364	183,220	24,032	159,188	12,718

(continued)

TABLE A-III (concluded)

1945	180,939	12,829	168,110	309	180,630	23,420	157,210	12,158
1946	165,605	11,373	154,232	449	165,156	12,452	152,704	12,416
1947	164,134	13,114	151,020	601	163,533	9,602	153,931	11,909
1948	173,021	14,436	158,585	702	172,319	9,639	162,680	12,785
1949	170,637	15,316	155,321	696	169,941	10,097	159,844	12,722
1950	187,411	16,053	171,358	812	186,599	10,449	176,150	12,890
1951	199,419	17,253	182,166	921	198,498	12,951	185,547	12,149
1952	205,800	16,709	189,091	858	204,942	13,866	191,076	12,212
1953	213,964	17,635	196,329	856	213,108	13,787	199,321	13,057
1957[p]	236,002	20,774	215,228	1,338	234,664	13,952	220,712	13,939

[p] = preliminary.

[a] Farm gross product is equivalent to net farm output of Appendix B, which is net of intermediary products but gross of capital consumption.

[b] Annual average for decade.

TABLE

Private Domestic Economy: Comparison of Industry Outpu
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	Farm[a]	Fisheries	Mining	Construc-tion	Manufac-turing	Trade[b]
1869	32.4	44.9	5.1	11.8	7.1	7.2
1879	50.3	54.5	9.8	18.4	10.2	14.3
1889	63.1	54.8	18.7	33.4	18.3	21.5
1899	79.2	59.8	31.3	43.5	27.5	32.6
1909	84.8	66.1	55.3	75.7	43.4	48.5
1919	89.9	76.9	68.7	56.3	61.0	64.6
1929	100.0	100.0	100.0	100.0	100.0	100.0
1937	102.3	120.6	95.7	61.4	103.3	104.2
1948	120.2	137.5	133.3	132.3	184.2	167.3
1953	123.8	143.0	138.4	174.1	243.4	190.2

[a] Adjusted to cover agricultural services.
[b] Adjusted to cover garages prior to 1929.
[c] Adjusted for full coverage.

A-IV
Aggregate with Real Gross Product, Key Years, 1869–1953
=100)

Transportation[c]	Communications and Public Utilities[c]	Post Office	Industry Aggregate Excluding Finance and Services[d]	Finance and Services[e]	Industry Aggregate	Real Gross Product[f]
4.0	0.9	2.4	10.3	2.9		8.2
7.9	1.7	5.8	16.7	14.9		16.2
20.2	3.2	11.3	25.9	17.9		23.6
35.7	6.7	19.8	37.1	33.6		36.1
55.8	22.6	42.3	53.5	56.0		54.2
82.2	45.8	71.8	68.1	71.7		69.1
100.0	100.0	100.0	100.0	100.0	100.0	100.0
103.1	115.5	92.0	101.2	89.2	97.8	102.5
211.8	249.5	148.8	172.7	132.0	161.1	163.8
228.9	336.0	174.4	209.7	162.6	196.3	200.7

[d] Adjusted to cover forestry and government enterprises other than Post Office.
[e] Derived as a residual, 1869–1929; and by deflation of national product originating in sectors, 1929–53.
[f] Index of real gross product, employing 1929 constant price weights.

TABLE A-V

Private Economy: Persons Engaged, by Class of Worker, Key Years, 1869–1957

	Proprietors and Unpaid Family Workers[a] (1)	*Employees* Full-Time Equivalent (2)	*Employees* Full- and Part-Time (3)	*Persons Engaged* (1) + (2) (4)	*Proprietors and Family Workers as Proportion of Persons Engaged* (5)	*Addendum: Full- and Part-Time Employees as Proportion of Full-Time Equivalents* (6)
	(number in thousands)				(per cent)	
1869	4,657	6,874	7,755	11,531	40.4	112.8
1879	6,490	8,608	9,626	15,098	43.0	111.8
1889	8,753	12,142	13,349	20,895	41.9	109.9
1899	10,101	15,767	17,244	25,868	39.0	109.4
1909	11,465	21,924	23,606	33,389	34.3	107.7
1919	11,752	27,238	29,029	38,990	30.1	106.6
1929	12,445	32,391	34,598	44,836	27.8	106.8
1937	12,253	30,924	33,027	43,177	28.4	106.8
1948	12,357	41,786	44,112	54,143	22.8	105.6
1953	11,374	45,706	48,191	57,080	19.9	105.4
1953[r]	11,824	45,718	48,439	57,542	20.5	106.0
1957[p]	11,571	47,106	50,143	58,677	19.7	106.4

[p] = preliminary.

[r] = revised (*U. S. Income and Output, 1958 Supplement, Survey of Current Business*, Dept. of Commerce).

[a] For the farm sector, proprietors and family workers are adjusted to full-time equivalents.

TABLE A-VI

National Economy: Persons Engaged, by Major Sector, 1869–1957

(thousands)

	Totdl		*General Government*[a]			*Private*		
	Incl. Military	Civilian	Total	Military	Civilian	Total	Farm	Non-farm[b]
1869–78[c]	13,412	13,371	458	41	417	12,954	6,490	6,464
1879–88[c]	18,435	18,398	618	37	581	17,817	8,200	9,617
1889	21,620	21,581	725	39	686	20,895	8,886	12,009
1890	22,327	22,290	739	37	702	21,588	9,009	12,579
1891	22,890	22,854	754	36	718	22,136	9,094	13,042
1892	23,573	23,536	774	37	737	22,799	9,178	13,621
1893	23,498	23,460	795	38	757	22,703	9,263	13,440
1894	23,031	22,990	819	41	778	22,212	9,348	12,864
1895	24,209	24,168	837	41	796	23,372	9,432	13,940
1896	24,332	24,292	849	40	809	23,483	9,517	13,966
1897	25,040	24,999	866	41	825	24,174	9,602	14,572
1898	25,400	25,217	1,028	183	845	24,372	9,687	14,685
1899	26,861	26,741	993	120	873	25,868	9,771	16,097
1900	27,295	27,172	1,023	123	900	26,272	9,856	16,416
1901	28,425	28,309	1,055	116	939	27,370	9,914	17,456
1902	29,647	29,544	1,071	103	968	28,576	9,972	18,604
1903	30,525	30,422	1,096	103	993	29,429	10,030	19,399
1904	30,419	30,312	1,130	107	1,023	29,289	10,089	19,200
1905	31,814	31,709	1,167	105	1,062	30,647	10,146	20,501
1906	33,071	32,962	1,213	109	1,104	31,858	10,205	21,653
1907	33,848	33,742	1,265	106	1,159	32,583	10,263	22,320
1908	33,086	32,961	1,333	125	1,208	31,753	10,321	21,432
1909	34,785	34,647	1,396	138	1,258	33,389	10,379	23,010

(continued)

TABLE A-VI (continued)

National Economy: Persons Engaged, by Major Sector, 1869–1957
(thousands)

	Total		*General Government*[a]			*Private*		
	Incl. Military	Civilian	Total	Military	Civilian	Total	Farm	Non-farm[b]
1910	35,708	35,573	1,453	135	1,318	34,255	10,437	23,818
1911	36,274	36,133	1,506	141	1,365	34,768	10,425	24,343
1912	37,341	37,192	1,565	149	1,416	35,776	10,440	25,336
1913	37,896	37,745	1,611	151	1,460	36,285	10,450	25,835
1914	37,475	37,314	1,688	161	1,527	35,787	10,456	25,331
1915	37,669	37,500	1,753	169	1,584	35,916	10,466	25,450
1916	40,126	39,952	1,794	174	1,620	38,332	10,497	27,835
1917	41,531	40,696	2,527	835	1,692	39,004	10,447	28,557
1918	43,998	41,030	5,060	2,968	2,092	38,938	10,311	28,627
1919	42,313	41,047	3,323	1,266	2,057	38,990	10,197	28,793
1920	41,497	41,144	2,314	353	1,961	39,183	10,343	28,840
1921	39,361	39,006	2,302	355	1,947	37,059	10,316	26,743
1922	41,383	41,117	2,264	266	1,998	39,119	10,269	28,850
1923	43,938	43,693	2,297	245	2,052	41,641	10,135	31,506
1924	43,315	43,054	2,399	261	2,138	40,916	10,034	30,882
1925	44,512	44,257	2,492	255	2,237	42,020	10,038	31,982
1926	45,795	45,544	2,553	251	2,302	43,242	9,992	33,250
1927	45,900	45,646	2,642	254	2,388	43,258	9,734	33,524
1928	46,382	46,126	2,695	256	2,439	43,687	9,772	33,915
1929	47,611	47,350	2,775	261	2,514	44,836	9,828	35,008

(continued)

TABLE A-VI (concluded)

1930	45,465	45,204	2,902	261	2,641	42,563	9,623	32,940
1931	42,607	42,350	2,984	257	2,727	39,623	9,814	29,809
1932	39,274	39,023	2,960	251	2,709	36,314	9,868	26,446
1933	39,615	39,366	3,473	249	3,224	36,142	9,809	26,333
1934	42,739	42,489	4,303	250	4,053	38,436	9,723	28,713
1935	44,224	43,961	4,585	263	4,322	39,639	9,804	29,835
1936	47,078	46,788	5,686	290	5,396	41,392	9,495	31,897
1937	48,233	47,920	5,056	313	4,743	43,177	9,223	33,954
1938	46,379	46,053	5,661	326	5,335	40,718	8,949	31,769
1939	47,769	47,427	5,630	342	5,288	42,139	8,730	33,409
1940	49,606	49,057	5,732	549	5,183	43,874	8,454	35,420
1941	54,097	52,421	6,748	1,676	5,072	47,349	8,215	39,134
1942	59,056	54,902	9,171	4,154	5,017	49,885	8,088	41,797
1943	64,864	55,835	14,208	9,029	5,179	50,656	8,043	42,613
1944	66,020	54,655	16,507	11,365	5,142	49,513	7,869	41,644
1945	64,363	53,061	16,369	11,302	5,067	47,994	7,700	40,294
1946	58,917	55,483	8,104	3,434	4,670	50,813	7,927	42,886
1947	59,264	57,665	6,068	1,599	4,469	53,196	7,994	45,202
1948	60,216	58,748	6,073	1,468	4,605	54,143	7,980	46,163
1949	58,702	57,098	6,389	1,604	4,785	52,313	7,672	44,641
1950	60,491	58,797	6,614	1,694	4,920	53,877	7,643	46,234
1951	64,191	61,067	8,475	3,124	5,351	55,716	7,350	48,366
1952	65,264	61,626	9,182	3,638	5,544	56,082	7,045	49,037
1953	66,219	62,674	9,139	3,545	5,594	57,080	6,825	50,255
1953[r]	66,693	63,148	9,151	3,545	5,606	57,542	6,825	50,717
1957[p]	67,728	64,943	9,051	2,785	6,266	58,677	5,834	52,843

[p] = preliminary.
[r] = revised (*U.S. Income and Output, 1958 Supplement, Survey of Current Business*, Dept. of Commerce).
[a] For detail, see Appendix K.
[b] Segment detail for key years is given in Table A-VII. Additional data and, in some cases, annual indexes for segments and groups are given in Appendixes C–J.
[c] Annual average for decade.

TABLE A-VII

National Economy: Persons Engaged, by Sector and by Industrial Division, Key Years, 1869–1957
(thousands)

	1869	1879	1889	1899	1909	1919	1929	1937	1948	1953	1953[r]	1957[p]
National economy[a]	11,910	15,639	21,620	26,861	34,785	42,313	47,611	48,233	60,216	66,219	66,693	67,728
Civilian economy	11,859	15,602	21,581	26,741	34,647	41,047	47,350	47,920	58,748	62,674	63,148	64,943
General government	328	504	686	873	1,258	2,057	2,514	4,743	4,605	5,594	5,606	6,266
Private economy	11,531	15,098	20,895	25,868	33,389	38,990	44,836	43,177	54,143	57,080	57,542	58,677
Farm	5,721	7,577	8,886	9,771	10,379	10,197	9,828	9,223	7,980	6,825	6,825	5,834
Nonfarm	5,810	7,521	12,009	16,097	23,010	28,793	35,008	33,954	46,163	50,255	50,717	52,843
Agricultural services, forestry, fisheries	37	63	110	141	183	221	247	261	273	300	300	327
Mining	151	281	507	659	1,079	1,145	1,057	963	1,005	873	877	839
Construction	580	645	964	1,315	1,744	1,516	2,392	1,807	3,326	3,716	3,878	4,259
Manufacturing	2,100	2,810	4,049	5,365	7,679	10,600	10,570	10,696	15,481	17,428	17,476	17,065
Trade	926	1,232	2,104	2,892	4,089	5,603	8,028	8,384	11,474	12,266	12,447	13,187
Finance, insurance, real estate	48	65	172	325	559	904	1,592	1,538	1,942	2,235	2,339	2,749
Transportation	569	766	1,435	1,908	2,691	3,357	3,051	2,351	3,013	2,974	3,010	2,867
Communications and public utilities	35	50	96	167	368	629	1,034	901	1,282	1,401	1,404	1,516
Services	1,323	1,547	2,481	3,204	4,360	4,514	6,628	6,579	7,647	8,220	8,144	9,160
Government enterprises	41	62	91	121	258	304	409	474	720	842	842	874

[p] = preliminary.
[r] = revised (*U.S. Income and Output, 1958 Supplement, Survey of Current Business*, Dept. of Commerce).

[a] With respect to labor, the national and domestic economies are practically identical.

TABLE A-VIII

National Economy: Persons Engaged, Comparison of Industry Aggregate and Census-based Series, Decennial, 1870–1950

	Based on *Census of Population* Data	Industry Aggregate	Ratio: Industry Aggregate to Census
	(millions)		
1870	12.1	12.0	0.99
1880	16.5	16.6	1.01
1890	22.4	22.3	1.00
1900	27.1	27.3	1.01
1910	35.5	35.7	1.01
1920	40.8	41.5	1.02
1930	44.0	45.5	1.03
1940	46.4	49.6	1.07
1950	58.5	60.4	1.03

SOURCE: For 1890–1950, see Clarence D. Long, *The Labor Force under Changing Income and Employment*, Princeton University Press (for NBER) 1958, Table C-1; 1870 and 1880 are based on estimates of gainful workers by Daniel Carson, "Changes in the Industrial Composition of Manpower since the Civil War," *Studies in Income and Wealth, Vol.* 11, New York (NBER) 1949, p. 47, adjusted for unemployment.

TABLE A-IX

National Economy: Average Hours Worked per Week, by Sector and by Industrial Division, Key Years, 1869–1957
(number)

	1869	1879	1889	1899	1909	1919	1929	1937	1948	1953	1957[p]
National economy[a]	53.7	52.8	53.5	53.4	52.0	49.1	48.6	44.4	41.8	40.3	39.6
Civilian economy	53.8	52.8	53.5	53.4	52.0	49.4	48.7	44.5	42.0	40.6	39.8
General government	34.6	35.1	36.3	37.4	39.0	37.1	37.4	36.5	34.6	34.3	33.8
Private economy	54.3	53.4	54.1	54.0	52.5	50.0	49.3	45.4	42.7	41.3	40.5
Farm	45.9	45.5	45.5	45.5	45.7	49.0	49.8	50.7	45.4	40.1	41.0
Nonfarm	62.7	61.3	60.4	59.1	55.6	50.4	49.2	43.9	42.2	41.4	40.4
Agricultural services, forestry, fisheries	52.5	51.9	51.2	51.3	50.9	48.7	47.7	44.1	44.9	44.3	43.5
Mining	46.6	48.2	45.4	42.6	41.8	40.5	42.1	33.8	39.3	37.6	38.3
Construction	55.6	55.1	51.8	51.2	44.1	41.8	42.6	36.0	39.8	39.4	38.7
Manufacturing	55.9	54.5	53.5	52.7	51.0	46.3	44.2	38.6	40.1	39.8	38.8
Trade	70.2	70.2	70.2	69.1	62.6	58.3	56.4	49.6	45.8	44.9	43.9
Finance, insurance, real estate	54.1	52.7	51.5	50.7	49.1	44.5	45.5	43.9	40.7	40.6	39.3
Transportation	61.9	62.2	64.3	63.5	62.0	52.4	50.1	46.8	47.8	43.5	43.1
Communications and public utilities	64.8	65.8	64.5	58.0	55.2	46.0	46.8	40.3	40.6	40.1	40.0
Services	74.3	72.1	68.8	66.5	63.0	56.2	52.8	49.1	41.3	40.9	39.2
Government enterprises	48.8	49.0	47.8	46.6	45.8	44.3	44.9	37.1	37.4	37.3	37.2

[p] = preliminary.

[a] With respect to labor, the national and domestic economies are practically identical.

SOURCE: Manhours estimates (Table A-XI) divided by corresponding estimates of persons engaged (Table A-VII) and 52 (weeks in the year). The average hours estimates for 1953 are virtually the same using either the unrevised or revised manhour and persons engaged series, although in a few instances there were differences of more than 0.2, due chiefly to changes in the Commerce estimates of full-time equivalents relative to full- and part-time employment.

TABLE A-X

National Economy: Manhours, by Major Sector, 1869–1957
(millions)

	Total		*General Government*[a]			*Private*		
	Incl. Military	Civilian	Total	Military	Civilian	Total	Farm	Non-farm[b]
1869–78[c]	37,046	36,954	848	92	756	36,198	15,381	20,817
1879–88[c]	51,192	51,110	1,162	82	1,080	50,030	19,422	30,608
1889	60,133	60,049	1,378	84	1,294	58,755	21,045	37,710
1890	62,280	62,200	1,411	80	1,331	60,869	21,337	39,532
1891	63,896	63,819	1,443	77	1,366	62,453	21,538	40,915
1892	66,002	65,923	1,491	79	1,412	64,511	21,738	42,773
1893	65,309	65,228	1,525	81	1,444	63,784	21,939	41,845
1894	63,096	63,009	1,571	87	1,484	61,525	22,139	39,386
1895	66,921	66,834	1,613	87	1,526	65,308	22,340	42,968
1896	66,917	66,834	1,633	83	1,550	65,284	22,541	42,743
1897	68,990	68,906	1,670	84	1,586	67,320	22,741	44,579
1898	69,718	69,343	2,005	375	1,630	67,713	22,942	44,771
1899	74,558	74,312	1,945	246	1,699	72,613	23,142	49,471
1900	75,486	75,235	2,007	251	1,756	73,479	23,343	50,136
1901	78,764	78,528	2,080	236	1,844	76,684	23,489	53,195
1902	82,109	81,899	2,117	210	1,907	79,992	23,635	56,357
1903	84,524	84,314	2,183	210	1,973	82,341	23,781	58,560
1904	83,351	83,130	2,250	221	2,029	81,101	23,927	57,174
1905	87,459	87,242	2,352	217	2,135	85,107	24,072	61,035
1906	90,904	90,679	2,450	225	2,225	88,454	24,218	64,236
1907	92,980	92,761	2,570	219	2,351	90,410	24,364	66,046
1908	89,188	88,931	2,693	257	2,436	86,495	24,510	61,985
1909	94,054	93,771	2,835	283	2,552	91,219	24,656	66,563

(continued)

Table A-X (continued)

National Economy: Manhours, by Major Sector, 1869–1957
(millions)

	Total		*General Government*[a]			*Private*		
	Incl. Military	Civilian	Total	Military	Civilian	Total	Farm	Non-farm[b]
1910	96,605	96,329	2,972	276	2,696	93,633	24,802	68,831
1911	98,500	98,211	3,079	289	2,790	95,421	25,319	70,102
1912	101,647	101,342	3,210	305	2,905	98,437	25,651	72,786
1913	102,466	102,158	3,302	308	2,994	99,164	25,325	73,839
1914	100,745	100,416	3,435	329	3,106	97,310	26,100	71,210
1915	99,982	99,638	3,555	344	3,211	96,427	25,568	70,859
1916	107,072	106,718	3,647	354	3,293	103,425	25,418	78,007
1917	110,690	108,993	5,105	1,697	3,408	105,585	26,126	79,459
1918	114,876	108,913	10,113	5,963	4,150	104,763	26,480	78,283
1919	107,930	105,387	6,516	2,543	3,973	101,414	25,992	75,422
1920	107,226	106,519	4,496	707	3,789	102,730	26,394	76,336
1921	96,877	96,175	4,362	702	3,660	92,515	24,348	68,167
1922	103,770	103,244	4,311	526	3,785	99,459	25,190	74,269
1923	111,793	111,308	4,432	485	3,947	107,361	25,367	81,994
1924	109,475	108,959	4,623	516	4,107	104,852	25,655	79,197
1925	113,442	112,938	4,833	504	4,329	108,609	26,180	82,429
1926	117,354	116,858	4,961	496	4,465	112,393	26,266	86,127
1927	116,906	116,406	5,155	500	4,655	111,751	25,243	86,508
1928	118,028	117,524	5,253	504	4,749	112,775	25,692	87,083
1929	120,338	119,825	5,397	513	4,884	114,941	25,474	89,467

(continued)

Table A-X (concluded)

1930	112,632	112,119	5,565	513	5,052	107,067	25,213	81,854
1931	103,769	103,284	5,613	485	5,128	98,156	25,770	72,386
1932	92,383	91,908	5,448	475	4,973	86,935	24,866	62,069
1933	92,552	92,079	6,495	473	6,022	86,057	24,809	61,248
1934	92,619	92,155	7,998	464	7,534	84,621	22,255	62,366
1935	97,756	97,277	8,576	479	8,097	89,180	23,157	66,023
1936	106,835	106,320	10,925	515	10,410	95,910	22,484	73,426
1937	111,443	110,887	9,568	556	9,012	101,875	24,307	77,568
1938	103,788	103,211	10,693	577	10,116	93,095	22,635	70,460
1939	108,532	107,927	10,653	605	10,048	97,879	22,748	75,131
1940	112,978	112,007	10,797	971	9,826	102,181	22,847	79,694
1941	124,204	121,006	12,874	3,198	9,676	111,330	22,054	89,276
1942	138,323	129,762	18,333	8,561	9,772	119,990	22,934	97,056
1943	156,325	135,269	31,942	21,056	10,886	124,383	22,750	101,633
1944	160,012	133,509	37,358	26,503	10,855	122,654	22,530	100,124
1945	150,012	126,029	34,073	23,983	10,090	115,939	21,019	94,920
1946	131,474	125,375	14,538	6,099	8,439	116,936	20,265	96,671
1947	130,317	127,477	10,893	2,840	8,053	119,424	19,352	100,072
1948	131,019	128,412	10,887	2,607	8,280	120,132	18,828	101,304
1949	126,402	123,553	11,399	2,849	8,550	115,003	18,219	96,784
1950	128,914	125,905	11,812	3,009	8,803	117,102	16,750	100,352
1951	135,876	130,328	15,096	5,548	9,548	120,780	15,979	104,801
1952	137,927	131,379	16,475	6,548	9,927	121,452	15,284	106,168
1953	138,567	132,186	16,361	6,381	9,980	122,206	14,231	107,975
1953[r]	139,819	133,438	16,393	6,381	10,012	123,426	14,231	109,195
1957[p]	139,577	134,564	16,028	5,013	11,015	123,549	12,445	111,104

[p] = preliminary.

[r] = revised (based on estimates of persons engaged as revised in *U. S. Income and Output, 1958 Supplement, Survey of Current Business*, Dept. of Commerce).

[a] For detail, see Appendix K.

[b] Segment detail for key years is given in Table A-XI. Additional group detail and, in some cases, annual indexes of segments and groups are given in Appendixes C through J.

[c] Annual average for decade.

TABLE A-XI

National Economy: Manhours, by Sector and by Industrial Division, Key Years, 1869–1957
(millions)

	1869	1879	1889	1899	1909	1919	1929	1937	1948	1953	1953[r]	1957[p]
National economy[a]	33,280	42,916	60,133	74,558	94,054	107,930	120,338	111,443	131,019	138,567	139,819	139,577
Civilian economy	33,166	42,833	60,049	74,312	93,771	105,387	119,825	110,887	128,412	132,186	133,438	134,564
General government	591	921	1,294	1,699	2,552	3,973	4,884	9,012	8,280	9,980	10,012	11,015
Private economy	32,575	41,912	58,755	72,613	91,219	101,414	114,941	101,875	120,132	122,206	123,426	123,549
Farm	13,642	17,945	21,045	23,142	24,656	25,992	25,474	24,307	18,828	14,231	14,231	12,445
Nonfarm	18,933	23,967	37,710	49,471	66,563	75,422	89,467	77,568	101,304	107,975	109,195	111,104
Agricultural services, forestry, fisheries	101	170	293	376	484	560	613	599	637	693	691	739
Mining	366	704	1,198	1,459	2,342	2,412	2,313	1,690	2,056	1,716	1,716	1,672
Construction	1,676	1,848	2,596	3,498	4,001	3,292	5,304	3,380	6,890	7,595	7,947	8,575
Manufacturing	6,105	7,964	11,264	14,700	20,365	25,525	24,290	21,467	32,278	36,076	36,175	34,438
Trade	3,381	4,496	7,677	10,394	13,310	16,979	23,555	21,616	27,334	28,489	29,048	30,106
Finance, insurance, real estate	135	178	461	857	1,427	2,092	3,767	3,511	4,109	4,718	4,937	5,619
Transportation	1,833	2,477	4,801	6,303	8,681	9,154	7,949	5,725	7,485	6,810	6,811	6,432
Communications and public utilities	118	171	322	504	1,056	1,506	2,517	1,886	2,709	2,906	2,925	3,154
Services	5,114	5,801	8,872	11,087	14,283	13,201	18,204	16,780	16,406	17,347	17,311	18,679
Government enterprises	104	158	226	293	614	701	955	914	1,400	1,625	1,634	1,690

[p] = preliminary.

[r] = revised (based on estimates of persons engaged as revised in *U.S. Income and Output, 1958 Supplement, Survey of Current Business*, Dept. of Commerce).

[a] With respect to labor, the national and domestic economies are practically identical.

TABLE A-XII

Civilian Economy: Employment, Average Hours, and Manhours, Comparison of Industry Composite with Census Survey Estimates, 1940–57

	Employment			*Average Hours Worked per Week*			*Manhours*		
	MRLF[a]	Industry Composite[b]	Ratio (2) ÷ (1)	MRLF[c]	Industry Composite (8) ÷ (2) ÷ 52	Ratio (5) ÷ (4)	MRLF (1) × (4) × 52	Industry Composite	Ratio (8) ÷ (7)
	(thousands)						(millions)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1940	46,330	49,057	1.059	44.5	43.9	0.987	107,208	112,007	1.045
1941	49,370	52,421	1.062	45.6	44.4	0.974	117,066	121,006	1.034
1942	52,650	54,902	1.043	46.6	45.5	0.976	127,581	129,762	1.017
1943	53,250	55,835	1.049	48.6	46.6	0.959	134,573	135,269	1.005
1944	52,200	54,655	1.047	48.0	47.0	0.979	130,291	133,509	1.025
1945	50,810	53,061	1.044	46.3	45.7	0.987	122,330	126,029	1.030
1946	52,990	55,483	1.047	44.2	43.5	0.984	121,792	125,375	1.029
1947	55,554	57,665	1.038	43.5	42.5	0.977	125,663	127,477	1.014
1948	56,626	58,748	1.037	43.2	42.0	0.972	127,205	128,412	1.009
1949	56,180	57,098	1.016	42.6	41.6	0.977	124,450	123,553	0.993
1950	57,309	58,797	1.026	42.4	41.2	0.972	126,355	125,905	0.996
1951	58,325	61,067	1.047	42.5	41.0	0.965	128,898	130,328	1.011
1952	58,479	61,626	1.054	42.4	41.0	0.967	128,934	131,379	1.019
1953	59,415	62,674	1.055	42.2	40.6	0.962	130,380	132,186	1.014
1953[r]	59,415	63,148	1.063	42.2	40.6	0.962	130,380	133,438	1.023
1957[p]	61,994	64,943	1.048	41.1	39.8	0.968	132,494	134,564	1.016

[p] = preliminary.
[r] = revised (*U.S. Income and Output, 1958 Supplement, Survey of Current Business*, Dept. of Commerce).

[a] MRLF = *Monthly Reports on the Labor Force*, Series P–57, Bureau of the Census. Excluding persons with job but not at work.
[b] Including employees as full-time equivalents.
[c] Adjusted for holiday weeks.

TABLE
National Economy: Real Labor Input and Manhours, Effect of 1929

	National Economy			*Private Economy*		
	Labor Input (1)	Man-hours (2)	Ratio (1) ÷ (2) (3)	Labor Input (4)	Man-hours (5)	Ratio (4) ÷ (5) (6)
1869	22.4	27.7	0.809	23.0	28.3	0.813
1879	29.1	35.7	0.815	29.8	36.5	0.816
1889	43.4	50.0	0.868	44.6	51.1	0.873
1899	55.4	62.0	0.894	56.7	63.2	0.897
1909	73.5	78.2	0.940	74.9	79.4	0.943
1919	88.7	89.7	0.989	88.6	88.2	0.983
1929	100.0	100.0	1.000	100.0	100.0	1.000
1937	92.0	92.6	0.994	87.4	88.6	0.986
1948	119.3	108.9	1.096	111.9	104.5	1.071
1953	129.9	115.1	1.129	117.2	106.3	1.103
1957[p]	129.4	114.9	1.126	116.9	106.4	1.099

[p] = preliminary.

A-XIII
Interindustry Manhour Shifts, by Major Sector, Key Years, 1869–1957
= 100

Private Nonfarm Economy			*Effect of Government-Private Shifts*	*Effect of Farm-Nonfarm Shifts*
Labor Input (7)	Man-hours (8)	Ratio (7) ÷ (8) (9)	(3) ÷ (6) (10)	(6) ÷ (9) (11)
19.4	21.2	0.915	0.995	0.889
25.0	26.8	0.933	0.999	0.875
39.6	42.1	0.941	0.994	0.928
52.7	55.3	0.953	0.997	0.941
72.3	74.4	0.972	0.997	0.970
84.9	84.3	1.007	1.006	0.976
100.0	100.0	1.000	1.000	1.000
86.7	8.86	1.000	1.008	0.986
117.6	113.2	1.039	1.023	1.031
126.3	120.7	1.046	1.024	1.054
126.9	122.8	1.033	1.025	1.064

APPENDIX A

TABLE

Distribution of Labor Input, Manhours, and Persons Engaged, by
(per

	1869			*1899*
	Persons Engaged	Man-hours	Labor Input[a]	Persons Engaged
National economy	100.0	100.0	100.0	100.0
Military	0.4	0.3	0.5	0.4
Civilian	99.6	99.7	99.5	99.6
General government	2.8	1.8	3.5	3.3
Private economy	96.8	97.9	96.0	96.3
Farm	48.0	41.0	20.0	36.4
Nonfarm	48.8	56.9	76.0	59.9
Agricultural services, forestry, fisheries	0.3	0.3	0.3	0.5
Mining	1.3	1.1	1.9	2.5
Construction	4.9	5.0	9.8	4.9
Manufacturing	17.6	18.3	28.2	20.0
Trade	7.8	10.2	13.6	10.8
Transportation	4.8	5.5	7.8	7.1
Communications and public utilities	0.3	0.4	0.5	0.6
Finance, insurance, and real estate	0.4	0.4	0.9	1.2
Services	11.1	15.4	12.4	11.9
Government enterprises	0.3	0.3	0.6	0.4

[a] Absolute figures on which these percentages are based were derived by multiplying 1929 labor compensation by labor input indexes for industries and summing to sector totals.

A-XIV
Sector and by Industrial Division, 1869, 1899, 1929, and 1957
cent)

1899		*1929*			*1957[p]*		
Man-hours	Labor Input[a]	Persons Engaged	Man-hours	Labor Input[a]	Persons Engaged	Man-hours	Labor Input[a]
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
0.3	0.4	0.5	0.4	0.5	4.1	3.6	3.5
99.7	99.6	99.5	99.6	99.5	95.9	96.4	96.5
2.3	4.0	5.3	4.1	6.3	9.3	7.9	12.2
97.4	95.6	94.2	95.5	93.2	86.6	88.5	84.3
31.0	13.5	20.7	21.2	8.1	8.6	8.9	3.0
66.4	82.1	73.5	74.3	85.1	78.0	79.6	81.3
0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.3
2.0	3.0	2.2	1.9	2.6	1.2	1.2	1.3
4.7	8.2	5.0	4.4	6.7	6.3	6.1	7.8
19.7	27.1	22.2	20.2	25.7	25.2	24.7	28.6
13.9	16.6	16.9	19.6	20.6	19.5	21.6	19.3
8.5	10.9	6.4	6.6	7.9	4.2	4.6	4.2
0.7	0.8	2.2	2.1	2.4	2.2	2.3	2.3
1.1	2.2	3.3	3.1	5.2	4.1	4.0	5.6
14.9	12.2	13.9	15.1	12.4	13.5	13.4	10.3
0.4	0.7	0.9	0.8	1.2	1.3	1.2	1.6

[p] = preliminary.

TABLE A-XV

National Economy: Real Capital Stocks, by Major Sector, 1869–1957
(millions of 1929 dollars)

	NATIONAL ECONOMY	NET FOREIGN ASSETS	DOMESTIC ECONOMY	GENERAL GOVERNMENT	PRIVATE DOMESTIC ECONOMY			
					Total	*Farm*	*Private Nonfarm* Residential	Nonresidential
1869–78[a]	54,098	−3,175	57,273	3,335	53,938	27,447	9,677	16,814
1879–88[a]	83,327	−3,425	86,752	4,717	82,035	36,276	18,465	27,294
1889	103,190	−4,250	107,440	5,722	101,718	40,132	28,448	33,138
1890	108,189	−4,448	112,637	5,920	106,717	40,848	30,845	35,024
1891	114,155	−4,586	118,741	6,106	112,635	41,683	32,888	38,064
1892	120,846	−4,667	125,513	6,268	119,245	42,401	34,926	41,918
1893	126,929	−4,764	131,693	6,430	125,263	42,872	36,903	45,488
1894	131,263	−4,803	136,066	6,610	129,456	43,472	38,576	47,408
1895	136,407	−4,940	141,347	6,811	134,536	44,193	40,456	49,887
1896	141,477	−4,982	146,459	7,048	139,411	44,989	42,326	52,096
1897	146,191	−4,908	151,099	7,440	143,659	45,992	44,104	53,563
1898	151,476	−4,938	156,414	7,959	148,455	47,073	45,748	55,634
1899	156,795	−4,750	161,545	8,448	153,097	48,004	47,138	57,955
1900	162,309	−4,638	166,947	8,920	158,027	48,799	48,122	61,106
1901	167,394	−4,573	171,967	9,425	162,542	49,298	49,042	64,202
1902	173,289	−4,288	177,577	9,901	167,676	50,234	50,156	67,286
1903	179,821	−4,082	183,903	10,448	173,455	51,231	51,182	71,042
1904	184,890	−3,968	188,858	11,110	177,748	51,876	52,384	73,488
1905	190,778	−3,876	194,654	11,770	182,884	52,701	54,381	75,802
1906	198,451	−3,804	202,255	12,359	189,896	53,562	56,844	79,490
1907	206,344	−3,580	209,924	12,974	196,950	54,096	58,858	83,996
1908	212,942	−3,410	216,352	13,758	202,594	54,524	60,628	87,442
1909	218,302	−3,507	221,809	14,554	207,255	55,295	62,665	89,295

(continued)

TABLE A-XV (continued)

1910	224,805	−3,554	228,359	15,320	213,039	56,229	64,538	92,272
1911	231,628	−3,508	235,136	16,177	218,959	57,627	65,974	95,358
1912	237,020	−3,367	240,387	17,053	223,334	58,178	67,462	97,694
1913	243,881	−3,244	247,125	17,871	229,254	58,602	69,070	101,582
1914	250,563	−3,094	253,657	18,662	234,995	59,079	70,644	105,272
1915	258,025	−1,702	259,727	19,688	240,039	60,627	72,246	107,166
1916	266,294	1,834	264,460	20,787	243,673	60,729	73,900	109,044
1917	273,796	4,017	269,779	21,525	248,254	61,353	74,780	112,121
1918	278,079	3,742	274,337	21,767	252,570	62,082	74,442	116,046
1919	281,995	3,874	278,121	21,594	256,527	62,600	74,243	119,684
1920	287,157	4,617	282,540	21,380	261,160	62,563	74,320	124,277
1921	292,222	5,942	286,280	21,800	264,480	61,766	74,763	127,951
1922	297,948	7,512	290,436	22,867	267,569	61,089	76,912	129,568
1923	306,702	8,176	298,526	24,069	274,457	60,420	80,458	133,579
1924	317,047	8,500	308,547	25,617	282,930	59,950	84,834	138,146
1925	328,372	9,146	319,226	27,318	291,908	60,003	89,860	142,045
1926	341,716	9,652	332,064	28,794	303,270	60,493	95,043	147,734
1927	354,297	10,164	344,133	30,388	313,745	60,605	99,904	153,236
1928	365,829	11,020	354,809	32,140	322,669	61,181	104,224	157,264
1929	377,073	11,984	365,089	34,024	331,065	61,463	107,336	162,266
1930	385,841	12,744	373,097	36,463	336,634	61,120	108,572	166,942
1931	389,232	12,934	376,298	39,032	337,266	61,542	108,680	167,044
1932	385,653	12,478	373,175	41,160	332,015	61,838	108,022	162,155
1933	376,913	11,486	365,427	42,360	323,067	60,950	106,649	155,468
1934	368,941	10,516	358,425	43,257	315,168	59,017	105,254	150,897
1935	365,700	8,892	356,808	44,988	311,820	58,788	104,304	148,728
1936	365,202	6,662	358,540	46,884	311,656	58,396	104,100	149,160
1937	369,145	5,067	364,078	48,682	315,396	58,877	104,382	152,137
1938	372,153	4,096	368,057	50,643	317,414	59,438	104,791	153,185
1939	373,890	2,960	370,930	53,228	317,702	59,629	105,675	152,398

(continued)

TABLE A-XV (concluded)

National Economy: Real Capital Stocks, by Major Sector, 1869–1957
(millions of 1929 dollars)

	NATIONAL ECONOMY	NET FOREIGN ASSETS	DOMESTIC ECONOMY	GENERAL GOVERNMENT	PRIVATE DOMESTIC ECONOMY			
					Total	*Farm*	*Private Nonfarm* Residential	Nonresidential
1940	380,676	1,514	379,162	56,972	322,190	60,952	107,102	154,136
1941	391,178	1,434	389,744	59,659	330,085	62,559	108,804	158,722
1942	398,536	1,920	396,616	60,278	336,338	64,399	109,532	162,407
1943	397,961	1,766	396,195	59,968	336,227	65,216	108,646	162,365
1944	393,473	1,476	391,997	58,662	333,335	65,307	107,220	160,808
1945	386,955	−274	387,229	57,204	330,025	64,765	105,847	159,413
1946	390,364	97	390,267	56,382	333,885	64,691	105,754	163,440
1947	405,751	4,760	400,991	56,700	344,291	64,478	107,355	172,458
1948	423,472	7,980	415,492	58,022	357,470	65,884	109,923	181,663
1949	439,184	8,760	430,424	59,546	370,878	68,262	112,880	189,736
1950	454,555	8,691	445,864	60,738	385,126	70,431	116,962	197,733
1951	472,716	8,507	464,209	62,010	402,199	72,023	121,420	208,756
1952	489,322	8,674	480,648	64,074	416,574	72,748	124,998	218,828
1953	503,932	9,029	494,903	65,988	428,915	72,521	128,604	227,790
1957[p]	569,370	10,110	559,260	74,160	485,100	73,331	n.a.	n.a.

[p] = preliminary.

n.a. = not available.

[a] Annual average for decade.

TABLE A-XVI

Domestic Economy and Private Sectors:[a] Real Capital Stocks, by Major Type, 1869–1953
(millions of 1929 dollars)

	DOMESTIC ECONOMY					PRIVATE DOMESTIC ECONOMY				
	Farm, Forest, and Park Land	*Structures (Including Site Land)*	*Equipment*	*Inventories*	*Monetary Gold and Silver*	*Farm and Forest Land*	*Structures*[b] Total	Nonresidential	*Equipment*	*Inventories*
1869–78[c]	21,320	24,205	5,029	6,543	176	19,447	23,025	13,348	4,929	6,537
1879–88[c]	26,204	40,714	8,216	10,993	625	24,442	38,566	20,101	8,044	10,983
1889	28,264	55,010	10,503	12,772	891	26,581	52,099	23,651	10,279	12,759
1890	28,634	58,787	10,921	13,377	918	26,965	55,700	24,855	10,689	13,363
1891	29,137	63,349	11,389	13,942	924	27,483	60,077	27,189	11,147	13,928
1892	29,641	68,513	11,879	14,590	890	28,001	65,042	30,116	11,627	14,575
1893	30,142	73,771	12,337	14,601	842	28,516	70,087	33,184	12,075	14,585
1894	30,644	78,037	12,554	14,022	809	29,034	74,130	35,554	12,288	14,004
1895	31,148	82,362	12,707	14,336	794	29,552	78,227	37,771	12,439	14,318
1896	31,648	86,181	13,095	14,723	812	30,068	81,820	39,494	12,819	14,704
1897	32,186	89,958	13,494	14,566	895	30,620	85,298	41,194	13,194	14,547
1898	32,769	93,938	13,805	14,874	1,028	31,218	88,908	43,160	13,474	14,855
1899	33,174	97,401	14,252	15,572	1,146	31,637	92,009	44,871	13,896	15,555
1900	33,614	100,825	14,935	16,331	1,242	32,092	95,063	46,941	14,557	16,315
1901	33,885	104,849	15,716	16,188	1,329	32,375	98,683	49,641	15,312	16,172
1902	34,012	109,293	16,631	16,250	1,391	32,511	102,722	52,566	16,209	16,234
1903	34,240	113,460	17,774	16,977	1,452	32,748	106,420	55,238	17,326	16,961
1904	34,516	117,257	18,755	16,804	1,526	33,034	109,649	57,265	18,277	16,788
1905	34,751	121,718	19,665	16,913	1,607	33,279	113,545	59,164	19,163	16,897
1906	34,990	126,968	20,923	17,677	1,697	33,527	118,291	61,447	20,417	17,661
1907	35,251	132,399	22,469	18,030	1,775	33,798	123,190	64,332	21,947	18,015
1908	35,537	137,511	23,552	17,925	1,827	34,093	127,627	66,999	22,964	17,910
1909	35,668	142,488	24,158	17,646	1,849	34,233	131,884	69,219	23,508	17,630

(continued)

TABLE A-XVI (continued)

Domestic Economy and Private Sectors:[a] Real Capital Stocks, by Major Type, 1869–1953
(millions of 1929 dollars)

	DOMESTIC ECONOMY					PRIVATE DOMESTIC ECONOMY				
	Farm, Forest, and Park Land	*Structures (including Site Land)*	*Equipment*	*Inventories*	*Monetary Gold and Silver*	*Farm and Forest Land*	*Structures*[b] Total	*Structures*[b] Nonresidential	*Equipment*	*Inventories*
1910	35,922	147,338	25,017	18,199	1,883	34,497	136,047	71,509	24,315	18,180
1911	37,253	151,246	25,826	18,852	1,959	35,837	139,230	73,256	25,064	18,828
1912	37,534	155,300	26,712	18,790	2,051	36,127	142,549	75,087	25,894	18,764
1913	37,453	160,040	27,985	19,535	2,112	36,055	146,569	77,499	27,123	19,507
1914	37,723	164,547	28,940	20,373	2,074	36,335	150,281	79,637	28,038	20,341
1915	38,526	168,236	29,334	21,366	2,265	37,147	153,139	80,893	28,421	21,332
1916	37,920	171,926	30,134	21,677	2,803	36,550	156,212	82,312	29,264	21,647
1917	37,564	174,823	31,757	22,335	3,300	36,204	158,772	83,992	30,967	22,311
1918	37,618	175,743	33,402	24,110	3,464	36,268	159,513	85,071	32,700	24,089
1919	37,806	176,456	34,378	26,158	3,323	36,464	160,156	85,913	33,774	26,133
1920	37,790	177,477	35,030	29,098	3,145	36,456	161,118	86,798	34,524	29,062
1921	38,121	178,995	35,031	30,725	3,408	36,791	162,404	87,641	34,607	30,678
1922	38,159	182,867	34,711	30,805	3,894	36,827	165,665	88,753	34,314	30,763
1923	37,298	189,124	35,454	32,443	4,207	35,964	171,083	90,625	35,008	32,402
1924	37,126	196,899	36,642	33,380	4,500	35,789	177,746	92,912	36,065	33,330
1925	37,257	206,021	37,815	33,555	4,578	35,918	185,433	95,573	37,056	33,501
1926	37,774	215,764	39,210	34,763	4,553	36,434	193,820	98,777	38,309	34,707
1927	37,947	225,721	40,398	35,564	4,503	36,603	202,305	102,401	39,330	35,507
1928	38,408	235,141	41,385	35,567	4,308	37,061	209,995	105,771	40,104	35,509
1929	38,720	243,320	42,806	36,001	4,242	37,370	216,418	109,082	41,332	35,945

(continued)

TABLE A-XVI (concluded)

1930	38,850	249,494	43,932	36,416	4,405	37,500	220,530	111,958	42,248	36,356
1931	39,452	253,203	43,528	35,696	4,419	38,106	221,892	113,212	41,642	35,626
1932	39,792	253,806	41,562	33,678	4,337	38,450	220,400	112,378	39,565	33,600
1933	39,460	251,705	38,983	31,011	4,268	38,122	217,019	110,370	36,991	30,935
1934	38,968	248,544	37,030	29,225	4,658	37,636	213,271	108,017	35,108	29,153
1935	39,269	246,180	36,201	29,375	5,783	37,937	210,284	105,980	34,296	29,303
1936	38,918	245,398	36,695	30,792	6,737	37,585	208,638	104,538	34,710	30,723
1937	39,165	246,288	38,096	33,034	7,495	37,833	208,577	104,195	36,020	32,966
1938	39,137	247,272	38,736	34,425	8,487	37,803	208,626	103,835	36,632	34,353
1939	39,053	248,352	38,835	34,733	9,957	37,718	208,642	102,967	36,682	34,660
1940	39,906	250,397	39,948	36,747	12,164	38,574	209,299	102,197	37,648	36,669
1941	40,224	253,333	42,178	40,337	13,672	38,896	211,164	102,360	39,781	40,244
1942	40,437	254,397	43,704	44,136	13,942	39,115	211,954	102,422	41,248	44,021
1943	40,472	252,531	43,785	45,624	13,783	39,155	210,314	101,668	41,275	45,483
1944	40,587	248,938	43,850	45,404	13,218	39,276	207,402	100,182	41,421	45,236
1945	40,038	245,234	44,780	44,385	12,792	38,734	204,566	98,719	42,498	44,227
1946	39,542	245,063	47,676	45,111	12,875	38,244	205,289	99,535	45,341	45,011
1947	38,754	248,183	53,443	46,940	13,671	37,457	209,131	101,776	50,827	46,876
1948	38,559	252,863	60,864	48,435	14,771	37,261	213,975	104,052	57,859	48,375
1949	39,302	258,830	67,106	49,910	15,276	38,003	219,283	106,403	63,744	49,848
1950	40,805	266,694	72,395	51,128	14,842	39,503	225,717	108,755	68,838	51,068
1951	41,084	275,621	77,921	55,233	14,350	39,780	233,049	111,629	74,193	55,177
1952	40,648	283,870	82,749	58,874	14,507	39,344	239,664	114,666	78,749	58,817
1953	40,227	292,235	86,978	61,134	14,329	38,922	246,261	117,657	82,652	61,080

[a] Totals shown in Table A-XV are not repeated here. General-government capital by type may be derived as the difference between the sector totals by type. The farm component by type is shown in Table B-III (for key years), so that private domestic nonfarm capital could also be derived as a residual.

[b] The residential (nonfarm) component is shown separately in Table A-XV.

[c] Annual average for decade.

TABLE A-XVII

National Economy: Total Factor Input,
Effect of Alternative Weighting Systems, Key Years, 1869–1957

	Changing Weights	*Fixed (1929) Weights*	*Unweighted Components*[a]	*Relative Movements: Ratio of Changing Weights to*	
	(1929 = 100)			Fixed Weights	Unweighted
1869	18.7	19.3	23.2	0.969	0.806
1879	25.1	25.8	30.7	0.973	0.818
1889	37.4	38.3	43.6	0.977	0.858
1899	50.0	50.7	56.2	0.986	0.890
1909	67.9	68.5	72.5	0.991	0.937
1919	85.1	85.3	85.5	0.998	0.995
1929	100.0	100.0	100.0	1.000	1.000
1937	92.8	92.9	94.1	0.999	0.986
1948	118.4	118.3	109.9	1.001	1.077
1953	132.3	133.2	120.3	0.993	1.100
1957[p]	135.9	138.2	125.1	0.983	1.086

[p] = Preliminary.

[a] Indexes of unweighted manhours and unweighted real capital stock combined by relative shares in national income in 1929.

TABLE A-XVIII

Private Domestic Economy: Total Factor Productivity,
Effect of Alternative Product and Input Weights, Key Years, 1869–1957
(1929 = 100)

	Real Product			*Real Input*			*Total Factor Productivity*		
	Changing Weights (1)	Fixed Weights (2)	Ratio (1) ÷ (2) (3)	Changing Weights (4)	Fixed Weights (5)	Ratio (4) ÷ (5) (6)	Changing Weights (7)	Fixed Weights (8)	Ratio (7) ÷ (8) (9)
1869	7.7	8.2	0.939	19.9	20.4	0.975	38.7	40.2	0.963
1879	15.6	16.2	0.965	26.9	27.2	0.989	58.0	59.6	0.973
1889	22.3	23.6	0.946	39.8	40.5	0.983	56.0	58.3	0.961
1899	34.6	36.1	0.959	52.9	53.3	0.992	65.4	67.7	0.966
1909	52.1	54.2	0.961	71.0	71.3	0.996	73.4	76.0	0.966
1919	69.7	69.1	1.008	84.9	84.9	1.000	82.1	81.4	1.009
1929	100.0	100.0	1.000	100.0	100.0	1.000	100.0	100.0	1.000
1937	101.0	102.5	0.985	88.9	89.2	0.997	113.6	114.9	0.989
1948	163.8	163.8	1.000	112.3	112.3	1.000	145.9	145.9	1.000
1953	202.9	200.7	1.011	121.9	123.4	0.988	166.4	162.6	1.023
1957[p]	225.2	222.3	1.013	125.5	128.3	0.978	179.4	173.3	1.035

[p] = preliminary.

TABLE A-XIX

National Economy: Real Net Product, Inputs, and Productivity Ratios, Kuznets Concept, National Security Version, 1869–1957
(1929 = 100)

	Output (Real Net Product)	Persons Engaged	Output per Person Engaged	Man-hours	Output per Manhour	Labor Input	Output per Unit of Labor Input	Capital Input	Output per Unit of Capital Input	Total Factor Input	Total Factor Productivity	Addendum: Output (Real Gross Product)
1869–78[a]	10.3	28.2	36.5	30.8	33.4	24.9	41.4	13.9	74.1	21.2	48.6	10.1
1879–88[a]	19.2	38.7	49.6	42.5	45.2	35.9	53.5	21.3	90.1	31.0	61.9	18.9
1889	21.5	45.4	47.4	50.0	43.0	43.4	49.5	25.5	84.3	37.4	57.5	21.7
1890	23.3	46.9	49.7	51.8	45.0	45.0	51.8	26.6	87.6	38.8	60.1	23.4
1891	24.4	48.1	50.7	53.1	46.0	46.3	52.7	28.1	86.8	40.2	60.7	24.6
1892	26.8	49.5	54.1	54.8	48.9	48.2	55.6	29.9	89.6	42.1	63.7	26.9
1893	25.1	49.4	50.8	54.3	46.2	47.4	53.0	31.4	79.9	42.2	59.5	25.5
1894	24.0	48.4	49.6	52.4	45.8	45.1	53.2	32.4	74.1	41.0	58.5	24.6
1895	27.6	50.8	54.3	55.6	49.6	48.6	56.8	33.7	81.9	43.8	63.0	27.9
1896	26.8	51.1	52.4	55.6	48.2	48.6	55.1	35.0	76.6	44.2	60.6	27.2
1897	29.7	52.6	56.5	57.3	51.8	50.4	58.9	36.1	82.3	45.8	64.8	30.0
1898	30.3	53.3	56.8	57.9	52.3	50.9	59.5	37.4	81.0	46.6	65.0	30.7
1899	33.5	56.4	59.4	62.0	54.0	55.4	60.5	38.7	86.6	50.0	67.0	33.7
1900	34.4	57.3	60.0	62.7	54.9	56.2	61.2	40.4	85.1	51.1	67.3	34.6
1901	38.8	59.7	65.0	65.5	59.2	59.3	65.4	41.8	92.8	53.6	72.4	38.7
1902	38.9	62.3	62.4	68.2	57.0	62.7	62.0	43.6	89.2	56.4	69.0	38.9
1903	41.0	64.1	64.0	70.2	58.4	64.9	63.2	45.4	90.3	58.6	70.0	40.9
1904	40.2	63.9	62.9	69.3	58.0	63.4	63.4	47.0	85.5	58.2	69.1	40.3
1905	43.2	66.8	64.7	72.7	59.4	67.4	64.1	48.4	89.2	61.3	70.5	43.2
1906	48.8	69.5	70.2	75.5	64.6	70.7	69.0	50.4	96.8	64.2	76.0	48.4
1907	49.4	71.1	69.5	77.3	63.9	72.6	68.0	52.6	93.9	66.2	74.6	49.2
1908	43.9	69.5	63.2	74.1	59.2	68.8	63.8	54.5	80.6	64.5	68.1	44.6
1909	50.8	73.1	69.5	78.2	65.0	73.5	69.1	55.7	91.2	67.9	74.8	50.9

(continued)

TABLE A-XIX (continued)

1910	51.1	75.0	68.1	80.3	63.6	76.0	67.2	57.6	88.7	70.2	72.8	51.4
1911	52.3	76.2	68.6	81.9	63.9	77.6	67.4	59.5	87.9	71.9	72.7	52.7
1912	55.2	78.4	70.4	84.5	65.3	80.7	68.4	61.2	90.2	74.6	74.0	55.6
1913	57.9	79.6	72.7	85.1	68.0	81.8	70.8	63.2	91.6	76.0	76.2	58.2
1914	52.2	78.7	66.3	83.7	62.4	79.6	65.6	65.3	79.9	75.3	69.3	53.3
1915	54.0	79.1	68.3	83.1	65.0	79.4	68.0	67.6	79.9	75.9	71.1	55.1
1916	63.9	84.3	75.8	89.0	71.8	86.9	73.5	70.4	90.8	81.8	78.1	64.2
1917	63.3	87.2	72.6	92.0	68.8	90.7	69.8	73.2	86.5	85.3	74.2	64.0
1918	71.7	92.4	77.6	95.5	75.1	95.3	75.2	75.0	95.6	89.0	80.6	72.0
1919	73.8	88.9	83.0	89.7	82.3	88.7	83.2	76.7	96.2	85.1	86.7	74.4
1920	70.6	87.2	81.0	89.1	79.2	87.7	80.5	78.5	89.9	85.0	83.1	71.4
1921	66.6	82.7	80.5	80.5	82.7	78.0	85.4	80.2	83.0	78.7	84.6	67.4
1922	71.1	86.9	81.8	86.2	82.5	84.3	84.3	81.6	87.1	83.5	85.1	71.9
1923	81.9	92.3	88.7	92.9	88.2	92.3	88.7	83.6	98.0	89.7	91.3	81.8
1924	83.3	91.0	91.5	91.0	91.5	89.7	92.9	86.1	96.7	88.6	94.0	83.1
1925	86.3	93.5	92.3	94.3	91.5	93.3	92.5	88.5	97.5	91.9	93.9	86.2
1926	91.8	96.2	95.4	97.5	94.2	97.1	94.5	91.6	100.2	95.5	96.1	91.8
1927	92.7	96.4	96.2	97.1	95.5	97.2	95.4	94.5	98.1	96.4	96.2	92.7
1928	93.8	97.4	96.3	98.1	95.6	97.8	95.9	97.2	96.5	97.6	96.1	94.1
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	89.6	95.5	93.8	93.6	95.7	92.7	96.7	102.5	87.4	95.1	94.2	90.6
1931	80.7	89.5	90.2	86.2	93.6	83.7	96.4	103.2	78.2	88.5	91.2	82.4
1932	66.9	82.5	81.1	76.8	87.1	73.3	91.3	101.4	66.0	80.2	83.4	69.8
1933	65.3	83.2	78.5	76.9	84.9	73.5	88.8	98.4	66.4	79.7	81.9	68.2
1934	73.3	89.8	81.6	77.0	95.2	75.2	97.5	95.8	76.5	80.3	91.3	75.5
1935	82.2	92.9	88.5	81.2	101.2	79.8	103.0	94.5	87.0	83.4	98.6	83.2
1936	95.1	98.9	96.2	88.8	107.1	88.5	107.5	94.2	101.0	89.9	105.8	95.3
1937	101.4	101.3	100.1	92.6	109.5	92.0	110.2	95.3	106.4	92.8	109.3	100.9
1938	94.6	97.4	97.1	86.2	109.7	84.9	111.4	95.9	98.6	87.4	108.2	95.0
1939	102.9	100.3	102.6	90.2	114.1	89.7	114.7	95.8	107.4	91.1	113.0	102.7

(continued)

TABLE A-XIX (concluded)

National Economy: Real Net Product, Inputs, and Productivity Ratios, Kuznets Concept, National Security Version, 1869–1957
(1929 = 100)

	Output (Real Net Product)	Persons Engaged	Output per Person Engaged	Man-hours	Output per Manhour	Labor Input	Output per Unit of Labor Input	Capital Input	Output per Unit of Capital Input	Total Factor Input	Total Factor Productivity	Addendum: Output (Real Gross Product)
1940	110.1	104.2	105.7	93.9	117.3	94.4	116.6	97.2	113.3	95.0	115.9	109.1
1941	134.8	113.6	118.7	103.2	130.6	107.6	125.3	100.5	134.1	106.0	127.2	132.6
1942	152.6	124.0	123.1	114.9	132.8	123.7	123.4	103.2	147.9	119.0	128.2	149.9
1943	171.5	136.2	125.9	129.9	132.0	145.2	118.1	103.3	166.0	135.6	126.5	167.8
1944	183.1	138.7	132.0	133.0	137.7	149.6	122.4	102.1	179.3	138.8	131.9	179.2
1945	181.0	135.2	133.9	124.7	145.1	139.6	129.7	100.5	180.1	130.7	138.5	177.6
1946	163.3	123.7	132.0	109.3	149.4	119.2	137.0	102.6	159.2	115.4	141.5	160.1
1947	160.2	124.5	128.7	108.3	147.9	118.2	135.5	108.9	147.1	116.1	138.0	159.4
1948	163.6	126.5	129.3	108.9	150.2	119.3	137.1	115.6	141.5	118.4	138.2	163.7
1949	161.0	123.3	130.6	105.0	153.3	114.8	140.2	120.5	133.6	115.9	138.9	162.5
1950	178.6	127.1	140.5	107.1	166.8	118.1	151.2	125.0	142.9	119.4	149.6	179.0
1951	191.1	134.8	141.8	112.9	169.3	126.0	151.7	131.0	145.9	126.9	150.6	191.5
1952	198.9	137.1	145.1	114.6	173.6	128.7	154.5	135.3	147.0	130.0	153.0	197.9
1953	205.7	139.1	147.9	115.1	178.7	129.9	158.4	141.6	145.3	132.3	155.5	205.1
1954[p]	202.3	135.1	149.7	110.7	182.7	124.4	162.6	145.5	139.0	128.7	157.2	203.0
1955[p]	216.9	138.2	156.9	114.4	189.6	128.5	168.8	149.8	144.8	132.9	163.2	217.0
1956[p]	221.8	140.8	157.5	116.1	191.0	130.6	169.8	155.1	143.0	135.6	163.6	222.4
1957[p]	224.3	141.3	158.7	114.9	195.2	129.4	173.3	160.4	139.8	135.9	165.0	225.5

[p] = preliminary.
[a] Annual average for decade.

TABLE A-XX

National Economy: Real Net Product and Productivity Ratios, Kuznets Concept, Peacetime Version, Key Years, 1869–1957 (1929 = 100)

	Output (Real Net Product)[a]	Output per Unit of Labor Input	Output per Unit of Capital Input	Total Factor Productivity	Addendum: Output (Real Gross Product)[a]
1869	7.7	34.2	66.0	41.0	7.5
1879	15.5	53.3	89.1	61.8	15.2
1889	21.6	49.8	84.7	57.8	21.7
1899	33.3	60.1	86.0	66.6	33.5
1909	50.7	69.0	91.0	74.7	50.8
1919	68.7	77.5	89.6	80.7	69.8
1929	100.0	100.0	100.0	100.0	100.0
1937	101.3	110.1	106.3	109.2	100.9
1948	155.6	130.4	134.6	131.4	156.5
1953	182.4	140.4	128.8	137.9	184.3
1957*p*	206.7	159.7	128.9	152.1	209.8

p = preliminary.

[a] This is the series presented by Simon Kuznets, except that no allowance has been made for depreciation of munitions; and an adjustment has been applied to make output indexes comparable with the weighting scheme used in computing input indexes.

TABLE A-XXI

National Economy: Real Net Product and Productivity Ratios, Commerce Concept, Key Years, 1869–1957
(1929 = 100)

	OUTPUT, REAL NET PRODUCT	OUTPUT PER UNIT OF LABOR INPUT	OUTPUT PER UNIT OF CAPITAL INPUT	FACTOR PRODUCTIVITY	ADDENDUM				
					Ratio of Gross to Net Product	*Ratios of Domestic to National Economy Indexes*			
						Net Product	Capital Input	Total Input	Factor Productivity (Net Product)
1869	7.8	35.0	67.7	42.0	98.1	102.3	114.7	103.7	98.6
1879	15.7	54.0	90.2	62.5	98.1	101.3	114.4	104.0	97.4
1889	21.8	50.2	85.5	58.3	101.4	101.8	113.3	103.5	98.5
1899	33.9	61.2	87.6	67.8	100.9	101.5	111.4	103.0	98.5
1909	51.3	69.8	92.1	75.6	100.6	101.0	108.6	102.5	98.4
1919	70.3	79.3	91.7	82.6	101.4	100.0	103.3	101.1	98.9
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1937	104.4	113.5	109.5	112.5	98.9	100.6	102.0	100.4	100.2
1948	167.0	140.0	144.5	141.0	99.5	100.4	101.5	100.4	100.0
1953	209.9	161.6	148.2	158.7	99.3	100.4	101.6	100.4	100.0
1957^{p}	230.1	177.8	143.5	169.3	99.9	100.3	101.7	100.3	100.0

^{p} = preliminary.

TABLE A-XXII

Private Domestic Economy: Real Gross Product, Inputs, and Productivity Ratios, Commerce Concept, 1869–1957
(1929 = 100)

	Output (Real Gross Product)	Persons Engaged	Output per Person Engaged	Man-hours	Output per Manhour	Labor Input	Output per Unit of Labor Input	Capital Input	Output per Unit of Capital Input	Total Input	Total Factor Productivity	Addendum: Output (Real Net Product)
1869–78[a]	10.4	28.9	36.0	31.5	33.0	25.6	40.6	16.6	62.7	22.6	46.0	10.6
1879–88[a]	19.5	39.7	49.1	43.5	44.8	36.8	53.0	24.8	78.6	33.0	59.1	19.7
1889	22.3	46.6	47.9	51.1	43.6	44.6	50.0	29.8	74.8	39.8	56.0	22.1
1890	24.2	48.1	50.3	53.0	45.7	46.2	52.4	31.1	77.8	41.3	58.6	24.0
1891	25.3	49.4	51.3	54.3	46.6	47.6	53.2	32.8	77.1	42.8	59.1	25.1
1892	27.7	50.8	54.5	56.1	49.4	49.5	56.0	34.8	79.6	44.8	61.8	27.6
1893	26.3	50.6	52.0	55.5	47.4	48.6	54.1	36.6	71.9	44.8	58.7	25.8
1894	25.5	49.5	51.5	53.5	47.7	46.1	55.3	37.7	67.6	43.6	58.5	24.9
1895	28.8	52.1	55.3	56.8	50.7	49.9	57.7	39.2	73.5	46.7	61.7	28.5
1896	28.1	52.4	53.6	56.8	49.5	49.9	56.3	40.6	69.2	47.2	59.5	27.6
1897	31.0	53.9	57.5	58.6	52.9	51.7	60.0	41.7	74.3	48.7	63.7	30.6
1898	31.6	54.4	58.1	58.9	53.7	51.9	60.9	43.1	73.3	49.3	64.1	31.2
1899	34.6	57.7	60.0	63.2	54.7	56.7	61.0	44.4	77.9	52.9	65.4	34.4
1900	35.5	58.6	60.6	63.9	55.6	57.5	61.7	46.1	77.0	54.0	65.7	35.2
1901	39.6	61.0	64.9	66.7	59.4	60.7	65.2	47.6	83.2	56.7	69.8	39.6
1902	39.8	63.7	62.5	69.6	57.2	64.3	61.9	49.3	80.7	59.7	66.7	39.7
1903	41.9	65.6	63.9	71.6	58.5	66.6	62.9	51.3	81.7	61.9	67.7	41.8
1904	41.2	65.3	63.1	70.6	58.4	64.9	63.5	52.8	78.0	61.3	67.2	40.9
1905	44.3	68.4	64.8	74.0	59.9	69.0	64.2	54.2	81.7	64.4	68.8	44.2
1906	49.6	71.1	69.8	77.0	64.4	72.4	68.5	56.3	88.1	67.5	73.5	49.7
1907	50.5	72.7	69.5	78.7	64.2	74.3	68.0	58.6	86.2	69.5	72.7	50.5
1908	46.0	70.8	65.0	75.3	61.1	70.1	65.6	60.4	76.2	67.4	68.2	45.3
1909	52.1	74.5	69.9	79.4	65.6	74.9	69.6	61.8	84.3	71.0	73.4	51.8

(continued)

TABLE A-XXII (continued)

Private Domestic Economy: Real Gross Product, Inputs, and Productivity Ratios, Commerce Concept, 1869–1957
(1929 = 100)

	Output (Real Gross Product)	Persons Engaged	Output per Person Engaged	Man-hours	Output per Manhour	Labor Input	Output per Unit of Labor Input	Capital Input	Output per Unit of Capital Input	Total Input	Total Factor Productivity	Addendum: Output (Real Net Product)
1910	52.5	76.4	68.7	81.5	64.4	77.5	67.7	63.7	82.4	73.3	71.6	52.1
1911	54.5	77.5	70.3	83.0	65.7	79.0	69.0	65.7	83.0	75.0	72.7	54.0
1912	57.3	79.8	71.8	85.6	66.9	82.2	69.7	67.3	85.1	77.7	73.7	56.9
1913	59.7	80.9	73.8	86.3	69.2	83.2	71.8	69.4	86.0	79.0	75.6	59.2
1914	54.8	79.8	68.7	84.7	64.7	80.7	67.9	71.5	76.6	78.0	70.3	53.7
1915	56.4	80.1	70.4	83.9	67.2	80.4	70.2	73.2	77.0	78.3	72.0	55.3
1916	65.1	85.5	76.1	90.0	72.3	88.3	73.7	74.4	87.5	84.1	77.4	64.7
1917	63.0	87.0	72.4	91.9	68.6	90.7	69.5	76.3	82.6	86.3	73.0	62.0
1918	67.5	86.8	77.8	91.1	74.1	90.0	75.0	78.4	86.1	86.5	78.0	66.5
1919	69.7	87.0	80.1	88.2	79.0	86.7	80.4	80.3	86.8	84.9	82.1	68.5
1920	70.0	87.4	80.1	89.4	78.3	87.9	79.6	82.0	85.4	86.2	81.2	69.0
1921	67.5	82.7	81.6	80.5	83.8	77.8	86.8	83.2	81.1	79.3	85.1	66.8
1922	71.8	87.2	82.3	86.5	83.0	84.6	84.9	83.8	85.7	84.4	85.1	71.0
1923	82.0	92.9	88.3	93.4	87.8	93.0	88.2	85.5	95.9	90.9	90.2	82.0
1924	83.6	91.3	91.6	91.2	91.7	90.0	92.9	87.7	95.3	89.3	93.6	83.7
1925	86.6	93.7	92.4	94.5	91.6	93.6	92.5	89.8	96.4	92.5	93.6	86.6
1926	92.0	96.4	95.4	97.8	94.1	97.5	94.4	92.7	99.2	96.1	95.7	92.0
1927	93.0	96.5	96.4	97.2	95.7	97.3	95.6	95.4	97.5	96.8	96.1	93.0
1928	93.9	97.4	96.4	98.1	95.7	97.9	95.9	97.7	96.1	97.8	96.0	93.6
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(continued)

TABLE A-XXII (concluded)

1930	90.8	94.9	95.7	93.1	97.5	91.9	98.8	102.0	89.0	94.3	96.3	90.0
1931	84.0	88.4	95.0	85.4	98.4	82.3	102.1	102.1	82.3	87.1	96.4	83.0
1932	71.8	81.0	88.6	75.6	95.0	71.2	100.8	99.9	71.9	78.1	91.9	70.0
1933	70.0	80.6	86.8	74.9	93.5	70.5	99.3	96.5	72.5	76.7	91.3	68.2
1934	76.9	85.7	89.7	73.6	104.5	70.8	108.6	93.8	82.0	76.3	100.8	75.8
1935	83.8	88.4	94.8	77.6	108.0	74.9	111.9	92.5	90.6	79.1	105.9	83.6
1936	94.5	92.3	102.4	83.4	113.3	82.6	114.4	92.5	102.2	85.0	111.2	94.8
1937	101.0	96.3	104.9	88.6	114.0	87.4	115.6	93.8	107.7	88.9	113.6	101.9
1938	95.4	90.8	105.1	81.0	117.8	79.3	120.3	94.6	100.8	82.8	115.2	95.6
1939	104.1	94.0	110.7	85.2	122.2	84.2	123.6	94.3	110.4	86.6	120.2	105.0
1940	110.2	97.9	112.6	88.9	124.0	88.6	124.4	95.9	114.9	90.3	122.0	111.8
1941	130.4	105.6	123.5	96.9	134.6	99.3	131.3	99.0	131.7	99.3	131.3	132.7
1942	142.6	111.3	128.1	104.4	136.6	108.6	131.3	101.7	140.2	107.1	133.1	144.9
1943	153.1	113.0	135.5	108.2	141.5	114.2	134.1	101.8	150.4	111.5	137.3	155.6
1944	162.8	110.4	147.5	106.7	152.6	112.7	144.5	100.9	161.3	110.1	147.9	165.3
1945	160.4	107.0	149.9	100.9	159.0	106.3	150.9	99.8	160.7	104.9	152.9	162.4
1946	153.5	113.3	135.5	101.7	150.9	107.3	143.1	102.1	150.3	106.2	144.5	156.6
1947	157.4	118.6	132.7	103.9	151.5	110.6	142.3	107.3	146.7	110.0	143.1	158.8
1948	163.8	120.8	135.6	104.5	156.7	111.9	146.4	113.3	144.6	112.3	145.9	164.5
1949	162.9	116.7	139.6	100.1	162.7	106.6	152.8	118.1	137.9	109.1	149.3	162.4
1950	178.7	120.2	148.7	101.9	175.4	109.8	162.8	122.8	145.5	112.6	158.7	179.0
1951	188.5	124.3	151.6	105.1	179.4	114.4	164.8	129.1	146.0	117.5	160.4	188.5
1952	194.0	125.1	155.1	105.7	183.5	115.7	167.7	133.2	145.6	119.4	162.5	195.2
1953	202.9	127.3	159.4	106.3	190.9	117.2	173.1	139.6	145.3	121.9	166.4	203.9
1954[p]	199.5	123.6	161.4	102.1	195.4	111.8	178.4	143.6	138.9	118.5	168.4	199.3
1955[p]	217.3	127.0	171.1	106.1	204.8	116.3	186.8	148.0	146.8	122.9	176.8	217.5
1956[p]	222.6	129.5	171.9	107.8	206.5	118.4	188.0	153.4	145.1	125.7	177.1	222.4
1957[p]	225.2	129.8	173.5	106.4	211.7	116.9	192.6	158.2	142.4	125.5	179.4	224.4

[a] Annual average for decade.
[p] = preliminary.

TABLE A-XXII: Supplement

Private Domestic Economy: Productivity Ratios Based on Unweighted Inputs, 1869–1957
(1929 = 100)

	Unweighted Capital Input (measured in 1929 prices)	Output per Unit of Unweighted Capital Input	Total Input (weighted average of manhours and unweighted capital)	Output per Unit of Total Input (weighted average of manhours and unweighted capital)
1869–78[a]	16.3	63.8	26.5	39.2
1879–88[a]	24.8	78.6	37.4	52.1
1889	30.7	72.6	44.5	50.1
1890	32.2	75.2	46.3	52.3
1891	34.0	74.4	47.8	52.9
1892	36.0	76.9	49.6	55.8
1893	37.8	69.6	49.9	52.7
1894	39.1	65.2	49.0	52.0
1895	40.6	70.9	51.8	55.6
1896	42.1	66.7	52.3	53.7
1897	43.4	71.4	53.9	57.5
1898	44.8	70.5	54.6	57.9
1899	46.2	74.9	57.9	59.8
1900	47.7	74.4	58.9	60.3
1901	49.1	80.7	61.3	64.6
1902	50.6	78.7	63.7	62.5
1903	52.4	80.0	65.6	63.9
1904	53.7	76.7	65.4	63.0
1905	55.2	80.3	68.2	65.0
1906	57.4	86.4	71.0	69.9
1907	59.5	84.9	72.8	69.4
1908	61.2	75.2	71.2	64.6
1909	62.6	83.2	74.4	70.0
1910	64.4	81.5	76.4	68.7
1911	66.1	82.5	77.9	70.0
1912	67.5	84.9	80.2	71.4
1913	69.2	86.3	81.2	73.5
1914	71.0	77.2	80.7	67.9
1915	72.5	77.8	80.6	70.0
1916	73.6	88.5	85.1	76.5
1917	75.0	84.0	86.8	72.6
1918	76.3	88.5	86.7	77.9
1919	77.5	89.9	85.1	81.9
1920	78.9	88.7	86.4	81.0
1921	79.8	84.6	80.3	84.1
1922	80.8	88.9	84.9	84.6
1923	82.9	98.9	90.4	90.7
1924	85.5	97.8	89.6	93.3

(continued)

Table A-XXII: Supplement (concluded)

	Unweighted Capital Input (measured in 1929 Prices)	Output per Unit of Unweighted Capital Input	Total Input (weighted average of manhours and unweighted capital)	Output per Unit Total of Input (weighted average of manhours and unweighted capital)
1925	88.2	98.2	92.7	93.4
1926	91.6	100.4	96.0	95.8
1927	94.6	98.3	96.5	96.4
1928	97.5	96.3	97.9	95.9
1929	100.0	100.0	100.0	100.0
1930	101.7	89.3	95.2	95.4
1931	101.9	82.4	89.4	94.0
1932	100.3	71.6	81.5	88.1
1933	97.6	71.7	80.3	87.2
1934	95.2	80.8	78.8	97.6
1935	94.2	89.0	81.6	102.7
1936	94.1	100.4	86.0	109.9
1937	95.3	106.0	90.2	112.0
1938	95.9	99.5	84.4	113.0
1939	96.0	108.4	87.7	118.7
1940	97.3	113.3	90.9	121.2
1941	99.7	130.8	97.6	133.6
1942	101.6	140.4	103.9	137.2
1943	101.6	150.7	106.8	143.4
1944	100.7	161.7	105.5	154.3
1945	99.7	160.9	100.7	159.3
1946	100.9	152.1	101.6	151.1
1947	104.0	151.3	104.0	151.3
1948	108.0	151.7	105.4	155.4
1949	112.2	145.2	102.8	158.5
1950	116.3	153.7	105.0	170.2
1951	121.5	155.1	108.6	173.6
1952	125.8	154.2	110.0	176.4
1953	129.6	156.6	111.3	182.3
1954[p]	133.0	150.0	108.6	183.7
1955[p]	137.1	158.5	112.6	193.0
1956[p]	142.1	156.7	115.0	193.6
1957[p]	146.5	153.7	114.8	196.2

[a] Annual average for decade.
[p] = preliminary.

TABLE A-XXIII

Private Domestic Nonfarm Economy: Real Gross Product, Inputs, and Productivity Ratios, Commerce Concept, 1869–1957
(1929 = 100)

	Output (Real Gross Product)	Persons Engaged	Output per Person	Manhours	Output per Manhour	Labor Input	Output per Unit of Labor Input	Capital Input	Output per Unit of Capital Input	Total Factor Input	Total Factor Productivity
1869–78[a]	6.8	18.5	36.8	23.3	29.2	21.5	31.6	9.6	70.8	17.5	38.9
1879–88[a]	15.1	27.5	54.9	34.2	44.2	32.2	46.9	16.2	93.2	26.9	56.1
1889	17.3	34.3	50.4	42.1	41.1	39.6	43.7	20.9	82.8	33.5	51.6
1890	19.5	35.9	54.3	44.2	44.1	41.8	46.7	22.2	87.8	35.3	55.2
1891	20.5	37.3	55.0	45.7	44.9	43.2	47.5	24.0	85.4	37.0	55.4
1892	23.6	38.9	60.7	47.8	49.4	45.3	52.1	26.2	90.1	39.1	60.4
1893	22.1	38.4	57.6	46.8	47.2	44.2	50.0	28.3	78.1	39.2	56.4
1894	21.0	36.7	57.2	44.0	47.7	41.3	50.8	29.5	71.2	37.8	55.6
1895	24.3	39.8	61.1	48.0	50.6	45.4	53.5	31.0	78.4	41.0	59.3
1896	22.9	39.9	57.4	47.8	47.9	45.3	50.6	32.4	70.7	41.5	55.2
1897	25.5	41.6	61.3	49.8	51.2	47.3	53.9	33.4	76.3	43.1	59.2
1898	25.8	41.9	61.6	50.0	51.6	47.4	54.4	34.7	74.4	43.7	59.0
1899	29.2	46.0	63.5	55.3	52.8	52.7	55.4	36.0	81.1	47.6	61.3
1900	30.0	46.9	64.0	56.0	53.6	53.5	56.1	37.8	79.4	48.8	61.5
1901	34.8	49.9	69.7	59.5	58.5	57.0	61.1	39.5	88.1	51.7	67.3
1902	35.1	53.1	66.1	63.0	55.7	60.9	57.6	41.2	85.2	54.8	64.1
1903	37.1	55.4	67.0	65.5	56.6	63.4	58.5	43.3	85.7	57.2	64.9
1904	36.1	54.8	65.9	63.9	56.5	61.5	58.7	44.9	80.4	56.6	63.8
1905	39.4	58.6	67.2	68.2	57.8	66.0	59.7	46.3	85.1	60.0	65.7
1906	44.7	61.9	72.2	71.8	62.3	69.7	64.1	48.6	92.0	63.3	70.6
1907	46.3	63.8	72.6	73.8	62.7	71.8	64.5	51.3	90.3	65.7	70.5
1908	41.1	61.2	67.2	69.3	59.3	67.0	61.3	53.3	77.1	63.3	64.9

(continued)

TABLE A-XXIII (continued)

1909	48.1	65.7	73.2	74.4	64.7	72.3	66.5	54.7	87.9	67.3	71.5
1910	48.2	68.0	70.9	76.9	62.7	75.1	64.2	56.7	85.0	70.0	68.9
1911	51.1	69.5	73.5	78.4	65.2	76.6	66.7	58.7	87.1	71.6	71.4
1912	52.4	72.4	72.4	81.4	64.4	80.0	65.5	60.5	86.6	74.6	70.2
1913	56.6	73.8	76.7	82.5	68.6	81.3	69.6	62.9	90.0	76.2	74.3
1914	49.9	72.4	68.9	79.6	62.7	78.1	63.9	65.3	76.4	74.6	66.9
1915	51.0	72.7	70.2	79.2	64.4	78.0	65.4	66.8	76.3	75.0	68.0
1916	62.2	79.5	78.2	87.2	71.3	86.9	71.6	68.3	91.1	81.7	76.1
1917	58.6	81.6	71.8	88.8	66.0	89.3	65.6	70.4	83.2	84.0	69.8
1918	64.8	81.8	79.2	87.5	74.1	88.4	73.3	72.7	89.1	84.1	77.1
1919	67.2	82.2	81.8	84.3	79.7	84.9	79.2	74.9	89.7	82.3	81.7
1920	67.7	82.4	82.2	85.3	79.4	86.0	78.7	77.1	87.8	83.7	80.9
1921	65.6	76.4	85.9	76.2	86.1	75.7	86.7	78.9	83.1	76.5	85.8
1922	69.7	82.4	84.6	83.0	84.0	82.9	84.1	79.9	87.2	82.1	84.9
1923	80.4	90.0	89.3	91.6	87.8	92.2	87.2	82.3	97.7	89.6	89.7
1924	82.7	88.2	93.8	88.5	93.4	88.7	93.2	85.2	97.1	87.8	94.2
1925	85.3	91.4	93.3	92.1	92.6	92.5	92.2	87.8	97.2	91.3	93.4
1926	91.5	95.0	96.3	96.3	95.0	96.8	94.5	91.3	100.2	95.4	95.9
1927	92.2	95.8	96.2	96.7	95.3	97.1	95.0	94.6	97.5	96.4	95.6
1928	93.5	96.9	96.5	97.3	96.1	97.5	95.9	97.2	96.2	97.4	96.0
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	90.5	94.1	96.2	91.5	98.9	91.3	99.1	102.5	88.3	93.8	96.5
1931	81.5	85.1	95.8	80.9	100.7	80.6	101.1	102.5	79.5	85.5	95.3
1932	68.5	75.5	90.7	69.4	98.7	68.9	99.4	99.7	68.7	75.7	90.5
1933	66.0	75.2	87.8	68.5	96.4	68.2	96.8	96.0	68.8	74.4	88.7
1934	75.6	82.0	92.2	69.7	108.5	69.4	108.9	93.3	81.0	74.7	101.2
1935	82.2	85.2	96.5	73.8	111.4	73.5	111.8	91.9	89.4	77.6	105.9
1936	94.9	91.1	104.2	82.1	115.6	82.1	115.6	92.0	103.2	84.3	112.6
1937	100.9	97.0	104.0	86.7	116.4	86.7	116.4	93.4	108.0	88.2	114.4
1938	94.1	90.7	103.7	78.8	119.4	78.3	120.2	94.2	99.9	81.8	115.0

(continued)

TABLE A-XXIII (concluded)

Private Domestic Nonfarm Economy: Real Gross Product, Inputs, and Productivity Ratios, Commerce Concept, 1869–1957
(1929 = 100)

	Output (Real Gross Product)	Persons Engaged	Output per Person	Manhours	Output per Manhour	Labor Input	Output per Unit of Labor Input	Capital Input	Output per Unit of Capital Input	Total Factor Input	Total Factor Productivity
1939	103.8	95.4	108.8	84.0	123.6	83.9	123.7	93.8	110.7	86.9	119.4
1940	110.8	101.2	109.5	89.1	124.4	89.1	124.4	95.2	116.4	90.5	122.4
1941	132.3	111.8	118.3	99.8	132.6	101.5	130.3	98.4	134.5	100.2	132.0
1942	145.0	119.4	121.4	108.5	133.6	111.6	129.9	101.1	143.4	109.4	132.5
1943	157.4	121.7	129.3	113.6	138.6	118.2	133.2	100.9	156.0	104.6	150.5
1944	168.2	119.0	141.3	111.9	150.3	116.6	144.3	99.8	168.5.	113.1	148.7
1945	166.1	115.1	144.3	106.1	156.6	110.0	151.0	98.7	168.3	107.7	154.2
1946	158.0	122.5	129.0	108.1	146.2	111.6	141.6	101.4	155.8	109.5	144.3
1947	163.0	129.1	126.3	111.9	145.7	115.9	140.6	107.8	151.2	114.3	142.6
1948	169.2	131.9	128.3	113.2	149.5	117.6	143.9	114.6	147.6	117.1	144.5
1949	168.3	127.5	132.0	108.2	155.5	111.9	150.4	119.6	140.7	113.6	148.2
1950	185.8	132.1	140.7	112.2	165.6	116.3	159.8	124.6	149.1	118.1	157.3
1951	197.6	138.2	143.0	117.1	168.7	122.1	161.8	131.4	150.4	124.4	158.8
1952	203.8	140.1	145.5	118.7	171.7	124.0	164.4	135.9	150.0	126.6	161.0
1953	212.8	143.6	148.2	120.7	176.3	126.3	168.5	143.3	148.5	129.9	163.8
1954[p]	208.3	139.3	149.5	115.8	179.9	120.3	173.2	147.9	140.8	126.2	165.1
1955[p]	227.0	144.3	157.3	120.6	188.2	125.3	181.2	153.0	148.4	131.1	173.2
1956[p]	232.8	148.7	156.6	123.4	188.7	128.0	181.9	159.6	145.9	134.6	173.0
1957[p]	236.2	149.6	157.9	122.8	192.3	126.9	186.1	165.5	142.7	135.0	175.0

[a] Annual average for decade.
[p] = preliminary.

TABLE A-XXIV

Private Domestic Economy, Aggregate of Industry Segments Covered by Output Data: Output, Inputs, and Productivity Ratios, Key Years, 1869–1953
(1929 = 100)

	Output	Persons Engaged	Output per Person	Manhours	Output per Manhour	Labor Input	Output per Unit of Labor Input
1869	10.9	27.7	39.4	29.4	37.1	24.5	44.5
1879	17.5	36.8	47.6	38.6	45.3	32.2	54.3
1889	26.7	49.8	53.6	53.2	50.2	47.3	56.4
1899	38.1	61.0	62.5	65.3	58.3	59.4	64.1
1909	54.1	77.8	69.5	81.2	66.6	77.9	69.4
1919	68.6	91.7	74.8	92.6	74.1	91.1	75.3
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1937	101.0	95.7	105.5	87.8	115.0	85.4	118.3
1948	169.8	121.7	139.5	107.1	158.5	113.5	149.6
1953	204.0	126.7	161.0	110.3	185.0	119.6	170.6

NOTE: Aggregate indexes are exclusive of finance and services throughout.

TABLE A-XXV

Private Domestic Economy, Aggregate of Industry Segments Covered by Capital Data: Output, Inputs, and Productivity Ratios, Key Years, 1869–1953
(1929 = 100)

	Output	Persons Engaged	Output per Person	Manhours	Output per Manhour	Labor Input	Output per Unit of Labor Input	Capital Input	Output per Unit of Capital Input	Total Factor Input	Total Factor Productivity
1869	12.1	33.6	36.0	35.3	34.3	28.4	42.6	18.2	66.5	25.4	47.6
1879	18.7	45.0	41.6	46.8	40.0	37.9	49.3	27.2	68.8	34.8	53.7
1889	28.2	58.6	48.1	61.8	45.6	53.1	53.1	38.0	74.1	48.7	57.9
1899	39.8	70.0	56.9	73.7	54.0	65.8	60.5	50.0	79.6	61.2	65.0
1909	54.6	86.9	62.8	91.3	59.8	87.9	62.1	69.5	78.6	82.5	66.2
1919	70.7	101.5	69.7	103.3	68.4	103.9	68.0	93.2	75.9	100.8	70.1
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1937	103.6	96.9	106.9	89.1	116.3	87.1	118.9	88.9	116.5	87.5	118.4
1948	171.9	119.9	143.4	105.3	163.2	111.7	153.9	117.4	146.4	113.0	152.1
1953	204.9	123.8	165.5	107.6	190.4	116.9	175.3	143.2	143.1	122.3	167.5

NOTE: Aggregate indexes are exclusive of trade prior to 1929 and of construction, finance and services, agricultural services, forestry, fisheries, and government enterprises throughout.