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Measures & Motivations

National Income and Product Estimates During the
Great Depression and World War II

By:

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The views in this paper are solely those of the author and not necessarily those of the Bureau of Economic Analysis, U.S. Department of Commerce, or the Office of Management and Budget. Research for this paper was done during the author's time as an economist for the Bureau of Economic Analysis, with minor revisions done later in his spare time.

Abstract: *This paper explains the early U.S. Department of Commerce estimates of national income and product during the 1930s and 1940s, focusing on how both economic theory and the needs of policymakers influenced the methods and concepts used. The paper explores the debate between Simon Kuznets, author of Commerce's first estimates of national income during the Great Depression, and Milton Gilbert, author of Commerce's first estimates of gross national product (GNP) during World War II, over the meaning and measurement of the nation's final product.*

Introduction

For more than seventy-five years, the United States Department of Commerce has produced estimates of national income and product for the U.S. economy. The history of measuring national income and product parallels the history of macroeconomic theory, as well as the history of U.S. economic policy, during most of the twentieth century. As measures of final product for the nation's economy, national income and gross national product (GNP) each served as an essential tool for policymakers and as a window through which economists could view the workings of a complex macro economy. Monumental events, such as the Great Depression and World War II (WWII), which required immense economic data for policy and planning, shaped much of the early work on the creation of national income and product estimates in the U.S.¹

During the Great Depression, the Department of Commerce began publishing estimates of national income; during WWII, it began publishing estimates of GNP. The transition at the Department of Commerce, from its first estimates of national income in 1934 to its first estimates of gross national product (GNP) during the period 1942-1947, embodied a shift in both the underlying macroeconomic theory and the policy applications. After WWII, the different Commerce authors of national income and GNP, Simon Kuznets and Milton Gilbert, engaged in a heated debate over the advantages of their respective measures of the nation's economic output, or final product.² On one

¹ See Marcuss-Kane (2007).

² See Kuznets (1948) and Gilbert-Jaszi-Denison-Schwartz (1948).

level, the issue of debate was the sheer difficulty of accurately measuring certain non-market transactions, such as the services provided by government and non-business capital. On another level, the issue of debate was the ‘objective’, or ‘end product,’ of economic activity that national income and product *should* be measuring. Although the discussion was often technical in nature—concerning issues such as the measurement of government output and the classification of goods and services as final products or intermediate inputs—it stemmed from a more fundamental debate over the meaning of economic growth and the motivation for measuring it.

Kuznets described national income, which he initially referred to as *national income produced*, as the basic concept from the standpoint of economic analysis, in that it was measuring the net product of the economic system.³ In 1934, Kuznets described national income as the value of “all commodities produced and all personal services rendered...added together at their market values... [minus] the value of goods, raw materials, and capital expended.”⁴ Although only income data was used for the first Department of Commerce estimates of national income, in estimates for the NBER during the 1930s Kuznets employed a similar definition of final product using his expenditure-based measures of consumption and gross capital formation.⁵ It was Kuznets’s view of national income as an important, but imperfect, measure of ‘economic welfare’ that shaped his criticisms toward the Department of Commerce’s estimates of GNP during the 1940s.

Gilbert described Commerce’s GNP estimates primarily as a tool for implementing fiscal policies, especially during the period of WWII mobilization and demobilization. Gilbert viewed Commerce’s national income estimates from the 1930s as inadequate for the task of revealing to economists and policymakers the impact on individuals and businesses from massive government expenditures for war, particularly in terms of assessing the impact on the U.S. economy’s production capacity and inflation. For WWII policy issues, competing demands between individuals, government, and business was a major policy concern. Gilbert reasoned that by showing the income and expenditures of individuals, government, and business, Commerce’s GNP estimates revealed the structure of the economy in way that addressed these concerns. In addition

³ Kuznets (1937), *Discussion: Concept of National Income*, p. 38.

⁴ U.S. Congress, Senate (1934), p.1

to being a more useful tool for policymakers, Gilbert also reasoned that Commerce's GNP concept of final product required the least amount of subjective assertions and judgment by economic accountants regarding whether expenditures should be considered 'final' (part of final consumption or investment), and no judgment regarding whether expenditures were 'beneficial' or 'necessary.'

Great Depression brings call for official government estimates

In 1933, when the Economic Research Division of the U.S. Department of Commerce's Bureau of Foreign and Domestic Commerce (BFDC) first began estimating national income, the work was motivated by the need to gauge the effects of the severe economic downturn that became known as the Great Depression.⁶ At the request of the U.S. Senate, a small group of economists and analysts, under the direction of Simon Kuznets, set to work on creating official government estimates of national income for the U.S. economy. Although the concept of national income was not then new, there existed numerous unresolved issues concerning method and scope. The first BFDC estimates of national income, published in a report to the Senate in 1934, showed how the Great Depression had affected different industries as well as income payments to labor, capital, and entrepreneurial ingenuity. The estimates showed that during the Great Depression, U.S. national income decreased by more than 50 percent, with the construction, mining, and manufacturing industries each experiencing declines in excess of 70 percent (see Figure 2).

The Senate had requested official government estimates of national income in an effort to better understand the increasingly dire economic situation of the early 1930s; there was, at that time, a lack of timely and comprehensive economic measures that could be used for policy analysis. Estimates of national income for the United States did exist, but they were done by individuals and private institutions, often using different methods

⁵ See Kuznets (1934).

⁶ The Economic Research Division of the Bureau of Foreign and Domestic Commerce became the Office of Business Economics (OBE) in 1947, and then the Bureau of Economic Analysis (BEA) in 1971.

and definitions, and tended to be more for historical analysis.⁷ Among these other estimates of national income, two of the more notable series during the 1920s were the National Industrial Conference Board series and the Wilford King-National Bureau of Economic Research (NBER) series. At that time, the King-NBER series was considered to be the most comprehensive, but many questioned the estimates, especially King's practice of including estimates for such items as the *services of consumer-owned capital* in the total for national income.⁸ In addition, when the Senate convened in 1931 to discuss national income estimates, the King-NBER series was only available through 1929.

Simon Kuznets directed the first BFDC national income estimates, overseeing the design of the methods and definitions. At that time, Kuznets also worked for the NBER, where his primary task was to continue King's national income series while improving the methods and definitions used.⁹ Alongside Kuznets, economists at the Economic Research Division of the BFDC, including Robert Martin and Robert Nathan, worked on the new estimates. The first national income series was completed within a year, and published in a report to the U.S. Senate in January 1934, entitled *National Income, 1929-1932*.¹⁰ After completing the Senate report, Kuznets continued to work on national income and product measurement for the NBER. Nathan took charge of the BFDC estimates from 1935 to 1941, when he was then appointed chief of the planning committee of the War Production Board.¹¹

National Income Estimates (1934-1941)

In the 1934 Senate report, as well as in subsequent national income reports and

⁷ In 1926, the U.S. Federal Trade Commission published estimates of national income along with estimates of national wealth. However, this one-time publication was never continued. See U.S. Congress, Senate (1926).

⁸ *Consumer-owned capital* included consumer durables and owner-occupied housing. See King (1930), the last King-NBER national income series volume published. There was also criticism of King's inclusion of changes in property values (regardless of whether property was sold). In 1930, King relegated gains/losses in property values from a component of national income to a component of a measure called *book income*. See King (1930) and Carson (1975) for a detailed account of King's estimates and the reactions to them.

⁹ King departed from NBER in 1929. Kuznets's work at NBER on national income during the early 1930s led to his paper, "National Income," which was published in the *Encyclopedia of the Social Sciences*, Vol. 11 (1933).

¹⁰ See U.S. Congress, Senate (1934).

¹¹ See Carson (1975) for a more detailed discussion of history. See Katz (2002) for more detailed discussion of Robert Nathan.

articles through 1941, the BFDC provided two measures of total income for the nation, *national income paid out* and *national income produced*.¹² National income paid out measured the flow of income payments to individuals. It consisted of all payments made to individuals for services rendered in the current production of goods and services, including wages and salaries, dividends and interest, proprietary income, and rental income.¹³ National income produced was a broader measure that attempted to encompass the full “market-value” of national product by adding a measure of *business savings* to national income paid out. Business savings encompassed undistributed profits from current production, after business taxes and capital depreciation.¹⁴ National income paid out and national income produced were not designed to be equal in value; business savings, which could be either positive or negative in value, made up the difference between the two measures. During the Great Depression, national income paid out exceeded national income produced due to negative business savings (see Figure 1).

Business savings was the key component that distinguished the measure of income produced from income paid out. In theory, business savings was the income retained by businesses from current production after purchasing materials, maintaining equipment and structures, paying out compensation to employees, distributing dividends and interest to investors, and paying taxes to government. In practice, it was estimated primarily from data gathered from corporate tax returns, whereby after-tax profits were adjusted to exclude capital gains and losses, as well as dividends.¹⁵ The costs of maintaining equipment and structures for their use in current production was implicitly estimated using the depreciation write-offs allowed by the IRS for the tax year.¹⁶

¹² During the late 1930s, the BFDC renamed *national income produced* to *national income* and renamed *national income paid out* to *income payments to individuals*. An explanation of the motivation for this change can be found in Kuznets (1937), *Discussion: Concept of National Income*, p.40.

¹³ The term, *entrepreneurial withdrawals*, was used instead of proprietary income and the term, *net rents and royalties*, was used instead of rental income.

¹⁴ Business taxes included corporate income taxes, corporate capital gains taxes, excise taxes, and sales taxes. Capital depreciation, in theory, referred to the cost to businesses of maintaining their capital equipment and structures.

¹⁵ Non-corporate businesses were assumed to have net profit ratios similar to corporations in the same industry.

¹⁶ Business savings also implicitly used business accounting practices for valuing inventories. At that time, businesses valued inventories at either original cost or replacement value, whichever was lower. The report noted the desire to adjust capital depreciation and inventory valuations to improve future estimates of business savings. The Senate report noted that these deficiencies likely contributed to lower values for business savings during 1930-1932, a period of substantial price declines. See U.S. Congress, Senate (1934), p. 11.

Business savings was described in the 1934 Senate report as subject to serious limitations, due mainly to the influencing peculiarities of business accounting practices for valuing capital depreciation and inventories.¹⁷

The 1934 Senate report, as well as later BFDC reports and articles, focused on the distribution of national income among industries and types of income payments. The breakdown of national income produced by industry showed how changes in economic growth affected each industry, while also revealing any changes in industry structure over time (see Figure 2). The breakdown of national income paid out by type of income payment showed how national income was allocated among groupings such as salaries and wages (see Figure 3).¹⁸

Government was treated as one of twelve industries. National income for government included income payments to government employees and interest payments on government debt. However, unlike for private industries, income paid out and income produced were equal for government, since government was assumed to have zero business savings. The BFDC did not treat the substantial fiscal deficits that the U.S. government ran during the 1930s as negative business savings. The Senate report noted that a separation of government outlays into current and capital expenditures, which was deemed impossible at that time, would be needed before a business savings component could be attributed to government.¹⁹

National income originating from government was valued in terms of the income paid out for current production. Because government goods and services were not sold in the marketplace, there was no direct way of measuring any value above or below the income paid out, which otherwise would have been included in a measure of government business savings. The BFDC noted that government was different from private industry in that changes in tax receipts and government expenditures probably did not correspond as closely with changes in the value of goods and services as did changes in private-industry revenues and costs.²⁰ In regards to the treatment of government tax receipts, income taxes paid by individuals were included in national

¹⁷ U.S. Congress, Senate (1934), p.11.

¹⁸ Types of income paid out included salaries, wages, dividends, interest, entrepreneurial withdrawals, and net rents and royalties.

¹⁹ U.S. Congress, Senate (1934), p. 125.

²⁰ U.S. Congress, Senate (1934), p.125

income, as part of income paid out; business taxes (both corporate income taxes and indirect taxes, such as sales and property taxes) were excluded from national income, since they were subtracted from profits to form the measure, business savings.

In addition to presenting and defining national income, the 1934 Senate report also discussed the potential uses and abuses of the estimates; in particular, it addressed the use of national income as a measure of welfare.²¹ In regards to using national income for welfare analysis, the report placed considerable emphasis on the limitations which stemmed from using monetary valuations of goods and services and from excluding the non-market transactions of households, such as the ‘household services’ performed by family members and the services provided by consumer capital, in the total for national income.²² Estimates for some of these ‘non-market transactions’ had been included in the King-NBER series, and Kuznets noted in the 1934 Senate report that they conceptually should be part of national income, once more precise methods for their estimation could be agreed upon.²³ Creating a consensus measure of national income was important to both the BFDC and the NBER. For estimating items such as household services and the services provided by consumer capital, a lack of adequate source data shaped the consensus view at that time toward excluding these items from national income.²⁴

The Kuznets Concept of National Product

Economists held a variety of opinions during the 1930s regarding the meaning of national income. Historically, measuring national income had often been linked to the goal of measuring changes in national wealth, though many economists sought to link it with more normative notions of net changes in output, or ‘psychic income.’ For instance, Morris Copeland questioned whether the services provided by “shyster lawyers” should be counted as contributing toward national income.²⁵ For measuring the final product generated from the majority of private goods and services sold in the market place, there

²¹ U.S. Congress, Senate (1934), p.5

²² Household services, or household production, were then referred to as the ‘services of housewives and other members of the family.’

²³ U.S. Congress, Senate (1934), p.4

²⁴ An imputed rental income value for owner-occupied housing was added to Kuznets’s NBER estimates of national product in 1937 and to U.S. Department of Commerce estimates in 1947.

²⁵ Copeland (1937), p.7.

was broad consensus concerning the methods and scope for measurement. The idea that final product could be estimated, in theory, using data on incomes, final expenditures, or industry sales net of intermediate purchases (or, inputs) was acknowledged by Kuznets and many other economists. Differences among economists during the 1930s and 1940s tended to surround the measurement of the non-market services in the economy, such as the services provided by the government and the services provided by households and consumer-owned capital. The debate involved both the sheer difficulty of accurately measuring non-market transactions, as well the ‘objective’, or ‘end product,’ of economic activity that national income *should* be measuring.

Kuznets described national income as a measure of the net product of the economic system.²⁶ Conceptually, national income produced was similar to what economists would today refer to as net national product. In addition, Kuznets described national income as an imperfect measure of ‘economic welfare’: It measured the net benefits received by individuals from economic production, but was limited by market transactions as the primary basis for its valuation of goods and services.²⁷ Kuznets did not view national income as a measure of actual welfare, or psychic income, which he recognized as a concept that could not be measured, and for which there would never be adequate data.

Kuznets reasoned that not all government expenditures directly benefited individuals. For instance, he argued that some government functions, such as business legislation, provided intermediate services (or, inputs) to businesses rather than final services to individuals.²⁸ Measuring government’s contribution to final product became a particular source of controversy among economists during the 1940s, when government’s role in the economy changed dramatically in the U.S. in response to WWII by becoming a massive purchaser of war-related goods from private industry. In the 1934 Senate report, Kuznets measured national income originating from government as if government were a private producer, though without any business savings. Business taxes were excluded from national income produced because Kuznets and the BFDC interpreted

²⁶ Kuznets (1937), *Discussion: Concept of National Income*, p. 38.

²⁷ In addition to the limitations in the scope of ‘economic activities’ covered, the effect of income distribution was one of Kuznets’s key concerns regarding the shortcomings of using market valuations to measure economic welfare. See U.S. Congress, Senate (1934), p.6.

²⁸ Kuznets also recognized that a portion of government expenditures were for capital formation, which he began estimating for NBER in the 1930s.

them to represent an expense for private businesses, in essence, a cost or payment for the intermediate government services (or, inputs) provided to businesses.²⁹ Although Kuznets refined his treatment of taxes and government investment in his later work for NBER, such as by using tax receipts to help measure government savings, his continued efforts were to measure government, as closely as possible, like a private producer.³⁰ During the 1940s, Kuznets expressed cynicism toward the Commerce method for GNP of including all government expenditures and business taxes in national product, as if government were more like a final consumer. He argued that Commerce's method tautologically ensured that fiscal spending would increase measured economic growth regardless of whether it actually benefited individuals' economic welfare.

Similarly, Kuznets aspired to also have national income measure the 'net' benefits received by individuals from their incomes. For instance, he reasoned that the measure, *income paid out*, failed to recognize that individuals received a flow of benefits from their own capital investments (e.g. consumer durables) and household 'production,' and that a substantial portion of individuals' incomes were spent, not on purchasing desired goods and services, but on purchasing 'regrettable necessities.'³¹ Kuznets noted that an ideal economic welfare measure *should* recognize the many purchases of regrettable necessities, made either by individuals or by government on their behalf, as intermediate purchases (or, inputs), rather than as part of final product. Kuznets described 'regrettable necessities' as expenses that individuals were required to make due to changing conditions in their lives that resulted from their participation in the production process of the economy.³² Kuznets believed regrettable necessities encompassed a substantial portion of individuals' purchases, such as expenses due to increased urbanization (e.g. costs for commuting to work), and to an increased need for national security during wartime.³³

For Kuznets, both the 'government controversy' and the issue of re-valuing income paid out for 'consumer capital,' 'household production,' and 'regrettable

²⁹ Kuznets reasoned that it was appropriate to include taxes paid by individuals in national product because they were, in essence, payments for final services rendered by government to individuals.

³⁰ See Kuznets (1941).

³¹ See Kuznets (1973). Also, Kuznets (1937), *Discussion: Concept of National Income*, p.37 refers to such expenses as "evils necessary in order to make a living (i.e. they are largely business expenses rather than living expenses)."

³² See Kuznets (1973) and Kuznets (1937), *Discussion: Concept of National Income*.

necessities' were part of the same issue of establishing a criterion for what should be included in a measure of a nation's final product. His criterion looked to the use, or function, of goods and services in a sense that employed notions of income and costs that strayed far outside the bounds set by business accounting. Admittedly, Kuznets recognized the subjectivity inherent in such a criterion. However, he argued that no measure of final product could be objectively measured, so long as it aspired to mean something beyond a measure of the volume of economic transactions. In the macro economy, where one group's income was inevitably another group's cost and both indirect and secondary transactions were numerous, Kuznets reasoned that some sort of 'end goal' had to be subjectively assigned to economic activity before an 'end product' could be measured.³⁴ For Kuznets, the end goal measured by national income should be the net value of all goods and services received by individuals from economic production.

World War II Brings New Policy Concerns

WWII mobilization brought drastic changes to the output of the U.S. economy. The two main intertwined economic policy issues stemming from the war effort were determining the amount of war-related production the U.S. economy could provide and controlling inflation. Shortly after the U.S. entered into war in both Europe and Asia, President Roosevelt announced a budget requiring annual defense expenditures to rapidly increase to what was then over half the size of national income produced.³⁵ Existing plants capable of producing machinery and vehicles for civilian use had to be converted to wartime production. Scarce resources, such as steel and rubber, had to be used for making tanks, bombs, and other war output instead of being used for consumer durables and private investment. Employment and the length of the average work week increased as the U.S. economy shifted from agricultural production to nonagricultural production and from civilian-use production to wartime production. As the economy shifted from butter to guns, the combination of sharply rising incomes and a contracting supply of non war-related goods and services brought substantial inflationary pressures.

³³ Individuals 'purchased' national security via increased taxes, according to Kuznets.

³⁴ Kuznets (1941), p.3. This view can be connected with Kuznets's preference for estimating several 'variants' of national product.

³⁵ Roosevelt (1941); cited in Gilbert (1942), *War Expenditures and National Production*, p.9.

The need to more accurately measure the effect of increasing government defense expenditures on the economy during WWII mobilization shifted final product (or, national product) measurement in a new direction. WWII pressed policymakers and economists to find better methods for measuring the war production potential of the economy and determining the amount of taxation and savings required to limit rampant inflation. Under the direction of Milton Gilbert, extensive work was done at the BFDC during the early 1940s in response to these pressing needs by establishing a new measure for the value of national product and its components.³⁶ The new BFDC measure, GNP, along with its income and final expenditure components, directly addressed the data needs for analyzing WWII policy issues.

The first BFDC article on GNP, published in the *Survey of Current Business* in March 1942, was titled, “War Expenditures and National Production.”³⁷ In this article, Gilbert criticized the use of national income, coupled with proposed outlays for the war effort, to estimate the amount by which non-war consumption would have to be curtailed in the U.S. in order for the necessary level of war output to be achieved.³⁸ Gilbert noted that many analysts were subtracting the White House’s then recently proposed \$56 billion in defense expenditures for 1943 from national income produced, comparing the difference with its equivalent for 1941, and then concluding that the change in the difference represented the extent to which non-war consumption (private and government nondefense) would have to be cut in order to make resources available for the war effort.³⁹

According to Gilbert and the BFDC, GNP provided a measure more appropriate for the short-run analysis of the war effort’s burden on the economy and for the

³⁶ Milton Gilbert directed national product measurement at the U.S. Department of Commerce from 1941 to 1949. He later served as head of national accounts at the Organization for European Economic Cooperation (OEEC) from 1950 to 1961. See Carson (1975) for more detailed history.

³⁷ See Gilbert (1942), *War Expenditures and National Production*.

³⁸ Gilbert (1942), *War Expenditures and National Production*, p. 9. Non-war consumption included expenditures on consumer goods and services, non-war related private investment, and government non-defense expenditures.

³⁹ Gilbert’s article was published shortly after the January 1942 White House Budget Message, which was the first to follow the attack on Pearl Harbor in December 1941. In the article, Gilbert assumed national income produced in 1943 to be \$110 billion and used White House projected defense expenditures for 1943 of \$56 billion. For 1941, defense expenditures were \$13 billion and national income produced was \$94 billion. Using the method that Gilbert criticized, the predicted curtailment of non war-related consumption was to have been from \$81 billion in 1941 (\$94 billion - \$13 billion) to \$54 billion in 1943 (\$110 billion - \$56 billion).

estimation of the value of resources available for war and non-war production.⁴⁰ Gilbert argued that it made more sense to subtract defense expenditures from GNP because GNP, unlike national income produced, represented a valuation of national product that included (or, was gross of) business taxes and business capital depreciation.⁴¹ Using a measure of national product that excluded business taxes ignored revenues available to the government that could be used to help fund the war effort. Excluding the value of capital depreciation did not allow for the fact that, in tough times, replacement of existing capital could often be delayed.

The result on wartime policy analysis from using GNP instead of national income was that the anticipated effect from WWII mobilization would not be quite as dire as many were then predicting, which alternatively implied that more aggressive war program goals for production were attainable. This was not only true because GNP was, by definition, larger in value than national income produced, but also because the final expenditure composition revealed by GNP showed how the income generated from national product was being spent. Using final expenditure measures, GNP estimates showed that despite the large reduction in non-war output needed to achieve the goals of the war effort, much of the decrease would be absorbed through a reduction in private investment and consumer durables, rather than a curtailment in the consumption of food, clothing, and shelter.⁴² Gilbert and the BFDC estimated that only about 10% of the output required to meet the war program goals for 1943 would require diverting resources away from the production of consumer services and nondurables and from government non-defense expenditures, while 48% of war output would require diverting resources away from gross private investment and the production of consumer durables (see Figure 4).⁴³

The BFDC's GNP estimates were also a useful tool for policymakers' efforts to control inflation. During the 1940s, numerous economists and policymakers, notably John M. Keynes in a 1940 publication, focused on the need to prevent rampant war-

⁴⁰ See Gilbert (1942), *Measuring National Income as Affected by the War* and Gilbert (1942), *War Expenditures and National Production*.

⁴¹ Gilbert (1942), *War Expenditures and National Production*, p. 10.

⁴² Gilbert noted that the composition of the reduction in non-war consumption, particularly for consumer durables and capital for private use, was largely dictated by wartime scarcities in raw materials.

⁴³ Gilbert (1942), *War Expenditures and National Production*, p 14. The remaining 42% of needed war output would come from increases in employment, hours worked, and productivity.

time inflation and the different policy measures for addressing it.⁴⁴ Economists blamed what they termed as the *inflationary gap* on the wartime phenomenon of increasing incomes from war production, coupled with a decreasing supply of goods and services available for private use.⁴⁵ The quantitative aspects of inflationary gap analysis relied heavily on measures of income and its disposition among consumption, taxes, and saving, since many policy measures aimed to reduce the inflationary gap by reducing incomes via increases in taxes, or reducing expenditures through voluntary, or forced, savings. The ability to observe changes in consumer expenditures, disposable income, and personal savings was vital in estimating both the need for and success of anti-inflationary policies.⁴⁶

In addition to policy issues related to WWII mobilization, the economic impact of postwar demobilization was also a growing policy concern for the BFDC as early as 1943.⁴⁷ Many policymakers and economists feared that the end of war mobilization efforts would lead the U.S. economy toward a return to 1930s unemployment levels. GNP's usefulness as a potential aid in analyzing business cycle fluctuations and in implementing postwar fiscal policies was recognized from the start. After WWII, the 1946 Employment Act, inspired by the political mantra for "full employment" in a post-war U.S. economy, set into law a role for government to help stabilize the economy by managing the business cycle. The BFDC's GNP estimates quickly emerged as the tool for policymakers to use in their attempts to implement counter-cyclical fiscal policies. In 1947, Milton Gilbert, along with BFDC economists George Jaszi, Edward Denison, and Charles Schwartz, created the National Income and Product Accounts (NIPAs), which expanded upon the GNP estimates by creating a more complete system of economic accounts showing the income and expenditure transactions of individuals, businesses, and government.⁴⁸

⁴⁴ See Keynes (1940), [How to Pay for the War: A Radical Plan for the Chancellor of the Exchequer](#).

⁴⁵ See Salant (1942) and Friedman (1942) for a thorough discussion of the inflationary gap.

⁴⁶ See Bangs (1942).

⁴⁷ For examples, see Livingston (1943), *Post-War Manpower and its Capacity to Produce*; Weiler (1943); and Livingston (1943), *Wartime Savings and Postwar Inflation*.

⁴⁸ See Office of Business Economics (1947).

GNP Estimates (1942-1947)

The BFDC published its first GNP series in 1942 (see Figure 5).⁴⁹ GNP differed from its previous measure of national product, national income produced, both in meaning and magnitude. Unlike national income produced, which measured the value of national product as the sum of income payments, plus business savings, GNP measured the value of national product as the sum of expenditures by individuals and government, plus gross private investment.⁵⁰ The new focus on final expenditures, as opposed to income payments alone, was a key aspect of GNP. However, since comprehensive data for final expenditure estimates were not yet fully available in 1942, GNP was, in practice, first estimated by adding business taxes and capital depreciation charges to national income produced (see Figure 6). Gilbert described the method of including capital depreciation and business taxes in national product as the valuation of national product at market prices; he referred to the former BFDC method of measuring national product via national income produced as the valuation of national product at factor costs.⁵¹

In addition to providing a new definition of national product, the GNP estimates included tables showing several component measures that were important gauges of the economy, both for wartime policy concerns and for business cycle analysis. The first BFDC estimates of GNP included tables showing estimates of income and consumption for individuals, income and investment for businesses, and tax receipts and expenditures for government (see Table A).⁵² These tables, which were the predecessors to the summary tables for the U.S. national income and product accounts (NIPAs), showed how individuals, business, and government--as sectors of the economy---interacted with one another and contributed to national product. For individuals, the estimates revealed purchasing power, via disposable income, and the composition of personal outlays for consumption, net savings, and tax payments. For

⁴⁹ See Gilbert-Bangs (1942).

⁵⁰ Net exports were then included as part of investment.

⁵¹ Gilbert (1942), *War Expenditures and National Production*, p.10. Gilbert's depiction of Kuznets concepts of national product and factor costs differed somewhat from Kuznets' own statements. Kuznets did not view *business savings* as part of factor costs. For Kuznets, *income paid out* was a measure of factor costs, while *national income produced* was a market-price valuation of national product. See Kuznets (1948), p.158 for explicit clarification.

⁵² Gilbert-Bangs (1942), p.12.

business, the estimates revealed gross business product, along with net savings generated from business activity, taxes paid, and gross investment. For government, the estimates showed the inflow of tax receipts from businesses and individuals, purchases of goods and services, and the composition of outlays among the broad functions of defense, nondefense, and state and local.⁵³

In 1947, culminating the work that began with the GNP estimates, the BFDC incorporated all of its income and product statistics into an inter-related system of income and product accounts, which it referred to as the NIPAs.⁵⁴ Many of the key, conceptual characteristics of the NIPAs were already part of the GNP estimates.⁵⁵ For instance, both the GNP estimates and the NIPAs included income and expenditure measures that could be added up to get the total value of national product. In addition, both focused on the composition of national product among the institutional sectors of government, business, and individuals and used a set of tables to show the relationships between key economic measures. However, the NIPAs went further than the original GNP estimates, in terms of providing both more component detail and a more complete picture of the economy's structure.

The NIPA accounting structure emphasized the fact that the income for each sector must equal the outlays and net saving, as well as the fact that total income and outlays for the economy as a whole should be equal. The accounting structure revealed each sector's economic transactions in terms of income and expenditures, as well as transfers of income between sectors (see Table B). Newly developed data on consumer expenditures were placed alongside a complete accounting of income, savings, and taxes for individuals; government expenditures were matched with a detailed accounting of government tax receipts and transfer payments; and business sales were placed alongside improved measures of business income and savings, including a newly added measure, corporate profits.⁵⁶

⁵³ Government enterprises, referred to as 'public service enterprises', were excluded from the government sector.

⁵⁴ Office of Business Economics (1947).

⁵⁵ A small number of 'conceptual' changes enacted in 1947 consisted of: reclassifying government interest payments from expenditures to transfers, redefining national income to include corporate income and capital gains taxes, including an inventory valuation adjustment (IVA), and creating an imputed measure of owner-occupied rents.

⁵⁶ Note: Consumer expenditures for nondurable goods and services were estimated as a residual until the creation of the NIPAs in 1947.

Presenting national income and product statistics in a system of accounts brought forth several distinct advantages. First, it added clarity to the debate over what components were included, or not included, in the valuation of national product. Second, it created a schematic whereby several different aggregate measures or components could be used with consistency. In a field where disputes over definitions persisted, a consistent set of measures helped analysts to distinguish between differences resulting from the use of different concepts and differences resulting from the use of different data. Third, the estimation of parallel income and expenditure estimates provided an excellent instrument for cross-checking estimates, which were derived from a variety of data sources. In this way, the system of accounts was also useful for the producers of economic statistics.

The Gilbert Concept of National Product

Gilbert viewed the GNP estimates primarily as a tool for implementing fiscal policies, especially during the period of WWII mobilization and demobilization. Gilbert viewed Kuznets' national income estimates as inadequate for the task of revealing to economists and policymakers the impact on individuals and businesses from massive government expenditures for war, particularly in terms of assessing both production capacity and inflation. He espoused the GNP estimates, and later the NIPAs, as far more useful because it was a system of measures that revealed the structure of the economy, rather than merely an estimate for total output.⁵⁷ In addition, though he deferred that other measures might be more appropriate for certain purposes, Gilbert reasoned that the BFDC measure of GNP provided the least subjective definition of final product.

Again, a key motivation behind the BFDC estimates of GNP was the desire to develop a measure of total economic output that was comparable with war expenditures. Gilbert argued that for calculating shares of war and non-war consumption in the U.S. economy, it made more sense to subtract war expenditures from GNP, instead of from national income produced, because both war expenditures and GNP were valued at 'market prices.' Gilbert's definition of market prices is more akin to modern readers' notion of *purchasers' prices*. Government expenditures for national defense, as outlined

⁵⁷ Gilbert-Jaszi-Denison-Schwartz (1948), p.181.

in the Federal Budget, included defense expenditures valued at the purchase price paid by government; national income produced represented a valuation of current production that was net of business taxes and capital depreciation, which Gilbert described as valuing national product via the payments to the factors of production.⁵⁸

Gilbert reasoned that a measure of national product at market prices (purchasers' prices) must include the prices paid by businesses for purchases of equipment and structures, as well as the portion of the proceeds from the sale of privately produced goods and services that accrue to government in the form of business taxes. Measuring private investment gross of capital depreciation moved national product estimates away from relying on a difficult-to-measure component of business income, capital depreciation, which was then helplessly influenced by changing tax policies and inconsistent accounting practices across businesses. Including business taxes allowed for a more complete accounting of the income flows generated from current production; plus, taxes were a key instrument for policymakers to observe. Gilbert noted that the decision to include business taxes, both direct business taxes (corporate income and corporate capital gains taxes) and indirect business taxes (excise taxes and sales taxes), had nothing to do with theories of tax incidence between businesses and individuals. Rather, he noted that it was only necessary to recognize that business taxes were paid by businesses, as a matter of administration, in order to include them in GNP.⁵⁹

Measuring private business investment gross of capital depreciation was not new in 1942; earlier attempts in the United States at estimating gross private investment had been done by Clark Warburton, who first used the term GNP, and Kuznets in the early 1930s.⁶⁰ Most economists and analysts at that time agreed that gross investment was a better measure for evaluating the macro economy in the short run than was net investment, due mainly to the difficulties of accurately measuring capital depreciation. However, including all tax revenues from businesses in the value for national product, along with all government expenditures, led to charges by Kuznets and others that the intermediate services (or, inputs) provided to businesses by government were being

⁵⁸ Gilbert noted that care must be taken in converting defense expenditures, as stated in the Federal Budget, to current defense expenditures. See Gilbert (1942), *Measuring National Income as Affected by the War*, p.187.

⁵⁹ Gilbert (1942), *Measuring National Income as Affected by the War*, p.191.

⁶⁰ See Warburton (1934) and Kuznets (1934).

counted as part of the nation's final product, and to the charge that tax-financed government spending was being 'counted twice.'⁶¹

For Gilbert, the basis for deciding whether purchases of goods and services contributed to final product, as defined in the GNP estimates, was the type of purchaser: All purchases by government and individuals were part of final product, and all business purchases of structures and equipment were part of final product. Business purchases of inputs that were 'used up' in the production process were excluded under the notion that their value was included in the market value of the final goods and services that business sold to individuals and government. Gilbert, along with the other NIPA authors, reasoned that it was impractical to establish a criterion based on use, or function, for all goods and services in order to determine whether to include them in national product, or treat them as intermediate inputs. BFDC economist, George Jaszi, in particular, argued that it was impossible to distinguish between government services that were for businesses and government services that were for individuals.⁶² Even more impractical to Gilbert and Jaszi was the notion of deciphering which individual and government purchases were for 'regrettable necessities,' rather than final goods and services. In addition, Gilbert expressed a skeptical view toward the meaningfulness of aggregate measures of factor costs, given the lofty assumptions regarding perfect competition and transferability that were implicit in factor-cost analysis.⁶³

Gilbert's view of the usefulness of a system of accounts was likely influenced by wartime estimates of income and product measurement in Great Britain. In 1941, a British white paper was published on war finances. It was written by Keynes and included a set of national income and expenditure accounts designed by James Meade and Richard Stone.⁶⁴ Economists in the U.K and the U.S. were familiar with each others work and attributed similar advantages to using a system of accounts. However, despite similarities in using an accounting approach to display national product and its components, the British system differed from the Department of Commerce's GNP estimates in terms of defining national product. For instance, in the British system, net measures of income and output were regarded as more significant than gross measures; in

⁶¹ Warburton (1934) also included business taxes in national product.

⁶² See Jaszi (1946).

⁶³ Gilbert (1942), *Measuring National Income as Affected by the War*, p.197-8.

⁶⁴ Central Statistical Office (1941).

the GNP estimates and the NIPAs, gross measures were central.⁶⁵ In part, this difference may have reflected views expressed in 1940 by Keynes, who preferred measuring national product valued at factor costs instead of at market prices for use in the analysis of wartime policy issues.⁶⁶ Keynes reasoned that payments to the factors of production, as opposed to market prices, were a better measure of the value of existing resources that could be diverted toward the war effort. By including all business taxes and capital depreciation, Gilbert and the BFDC measure of GNP was more similar to work done in 1936 by another British economist, Colin Clark, and his measure, *gross national income*, and to earlier work done in 1934 by economist, Clark Warburton.⁶⁷

The 1948 Debate

In 1948, Kuznets wrote a scathing critique of the then newly published NIPAs, to which its Commerce authors—Gilbert, Jaszi, Denison, and Schwartz—responded in writing.⁶⁸ The written debate provided an opportunity for both Kuznets and Gilbert to restate views each had previously expressed regarding the measurement of national product. Kuznets reiterated his disapproval toward the inclusion of government intermediate services and war expenditures in Commerce’s new GNP measure of national product. Gilbert, along with his co-authors, again noted his view that Kuznets’s measure of national product was less useful in its presentation and unrealistic in its aspirations for measuring welfare.

Kuznets extended his criticism of Commerce’s GNP measure of national product to its new system of economic accounts. In particular, he argued that the NIPAs’ focus on sector transactions, at best, did little to resolve issues of scope and definition for national product, and, more likely, contributed negatively by focusing on transactions rather than actual benefits flowing to individuals.⁶⁹ Kuznets also expressed concern that

⁶⁵ See Gilbert-Jaszi (1945).

⁶⁶ Keynes included direct business taxes as part of factor costs, but excluded indirect business taxes. See Keynes (1940), *The Concept of National Income: A Supplementary Note*, p.60.

⁶⁷ See Warburton (1934), Clark (1937) and Keynes (1940), *The Concept of National Income: A Supplementary Note*. Although Keynes made use of Clark’s extensive numeric estimates in much of his work, he criticized Clark’s measure, gross income, in his own work on national income during the war years.

⁶⁸ See Kuznets (1948) and Gilbert-Jaszi-Denison-Schwartz (1948).

⁶⁹ Kuznets (1948), p.154.

Commerce's GNP time series would show growth trends across different periods, such as across periods of war and peace, that would deceptively suggest that actual comparisons across time of their national product total was meaningful even when the purpose (i.e., the composition) of economic production had changed substantially from one time period to another. Kuznets advised a presentation of national product that categorized government expenditures and personal consumption by use, or function, in order to show the portions and types of transactions considered to be part of final product, perhaps for several variants of gross product totals.

Gilbert defended the NIPAs as a more useful tool for economists and policymakers to assess fiscal policies during periods of both war and peace. He reiterated his view that Kuznets's 'use', or 'functional,' criteria was impractical for defining national product and noted that, in a Kuznets system of accounts, many types of economic transactions that were of obvious relevance to understanding the economy's structure would be lost (not shown) and replaced by substantially large, imputed measures. Gilbert also argued that creating a time series of national product that supposedly excluded 'regrettable necessities' would force economic accountants to tread dangerously into the practice of making bold *ceritus-paribus* assertions regarding social, political, and economic conditions over time, rather than improve the long-term comparability of national product.

Despite the vast similarities in their measures of national product, the intensity of the debate was often strong. Kuznets wrote that Commerce's GNP measure forgot that "production was for man, not man for production."⁷⁰ George Jaszi, who not only worked under Gilbert, but also followed him in directing national product measurement at Commerce for decades, later reflected that it was one of his principal contributions as an economic accountant to help bring Kuznets's definition of national product "down to earth" and resist the forging of national product into a measure of economic welfare.⁷¹

⁷⁰ Kuznets (1945), p. 7

⁷¹ See Jaszi (1986), p.411. George Jaszi served as chief of the OBE National Income Division (1949-59), assistant director of OBE (1959-63), director of OBE (1963-71), and the first director of BEA (1971-85). See Carson (1975) for more detailed history.

Subsequent Progress and Controversy

The publication of the NIPAs in 1947 solidified a transition in the official U.S. national income and product statistics. GNP continued to be the measure of final product and the decision to portray government as a final purchaser in the accounts persisted.⁷² Over the following decades, the Department of Commerce proceeded to focus mostly on explaining its new measures and improving their timeliness and detail, rather than substantially altering or redefining the underlying theory and concepts behind the measurement of national product.⁷³ In particular, Commerce began regularly publishing detailed annual and quarterly constant-dollar measures starting in the 1950s.⁷⁴ Continued improvements in the ability to adjust for prices at increasingly disaggregated levels likely strengthened the preference among many economists for measuring national product via gross final expenditures.⁷⁵

Although Commerce's GNP became the predominant measure of national product, the concerns addressed by Kuznets continued to influence national product measurement. In regards to the 'government controversy,' Commerce provided more detailed information in the NIPAs on the various functions of government expenditures, such as for education and infrastructure, starting in 1958.⁷⁶ In addition, Commerce developed estimates of capital stock and economic depreciation for the private business sector, and also developed estimates for government and consumer-owned capital, starting in the 1970s. In regards to the issue of measuring 'regrettable necessities,' debate over the usefulness of GNP as a measure of welfare was revisited again in the early 1970s, fueled in part by concerns over the environmental costs of economic growth.⁷⁷ The later discussion shared similarities with the debate over Kuznets's aspirations for

⁷² Gross domestic product (GDP) replaced GNP as the featured measure of national product in the NIPAs, starting in 1991. BEA began publishing estimates for government investment expenditures in the NIPAs, starting in 1996.

⁷³ See Jaszi (1951)

⁷⁴ See Jaszi-Kendrick (1951) and Office of Business Economics (1958), *Real National Output by Quarters*.

⁷⁵ Both Kuznets and Gilbert were concerned with how well national income and product measures were portraying *real* changes, separate from changes in prices. Constant-dollar estimates of GNP were published with the initial Commerce estimates during WWII, though price controls admittedly made price measurement problematic. In the Senate report on national income in 1934, composite cost-of-living indexes and wholesale price indexes were used to 'approximately' adjust nominal, or current-dollar, estimates for changes in prices, while the report also included information on composite price indexes and deflated sales data for certain industries.

⁷⁶ Office of Business Economics (1958), *U.S. Income and Output*, p 66.

measuring the ‘net’ benefits from economic production. For instance, it was contested whether certain types of expenditures should be classified as expenses for ‘dis-amenities’ (i.e., pollution) caused by economic growth. In addition, the desire to measure the services of consumer-owned capital and household production was revisited.

National income and product accounts were further developed by several countries during the early post-WWII period. Milton Gilbert joined other experts from around the world—including Richard Stone, Richard Ruggles, and Nancy Ruggles—by leading the development of income and product accounts for the Organization for European Cooperation (OEEC) from 1950-1961.⁷⁸ The OEEC, a precursor to the Organization for Economic Cooperation and Development (OECD) was charged with administering aid for postwar reconstruction in Europe under the Marshall Plan. Work on the OEEC accounts also helped to produce the first United Nations System of National Accounts (SNA) in 1953.

⁷⁷ See Denison (1971) and Nordhaus-Tobin (1973).

⁷⁸ In addition to his key role in creating the British national accounts during WWII, Richard Stone also wrote Stone (1947) and played a stronger role in the creation of the United Nations 1968 SNA’s. For more information on Richard and Nancy Ruggles, see Fraumeni (2001).

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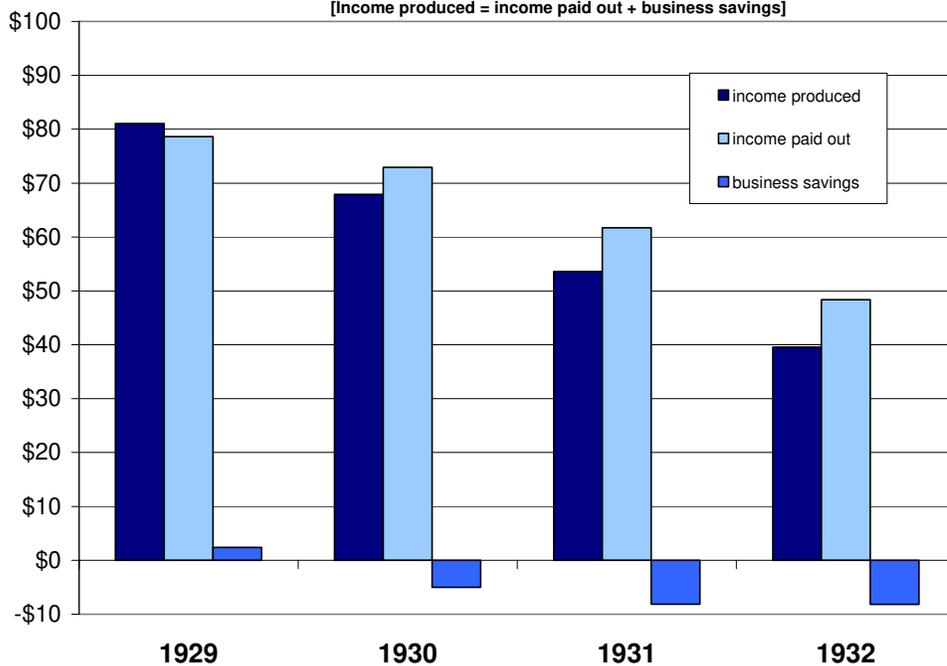
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Figure 1

**National Income Produced and National Income Paid Out
From 1929 to 1932**

[In billions of current dollars]

[Income produced = income paid out + business savings]

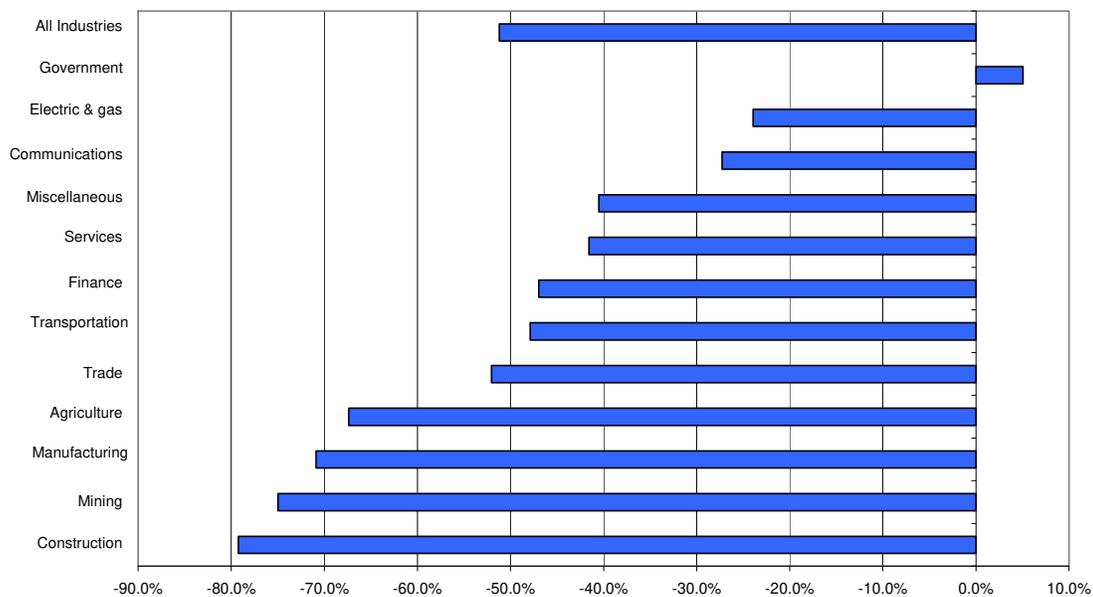


*From 1936 U.S. Department of Commerce report on national

Figure 2

**Percent Change in Income Produced By Industry
From 1929 to 1932**

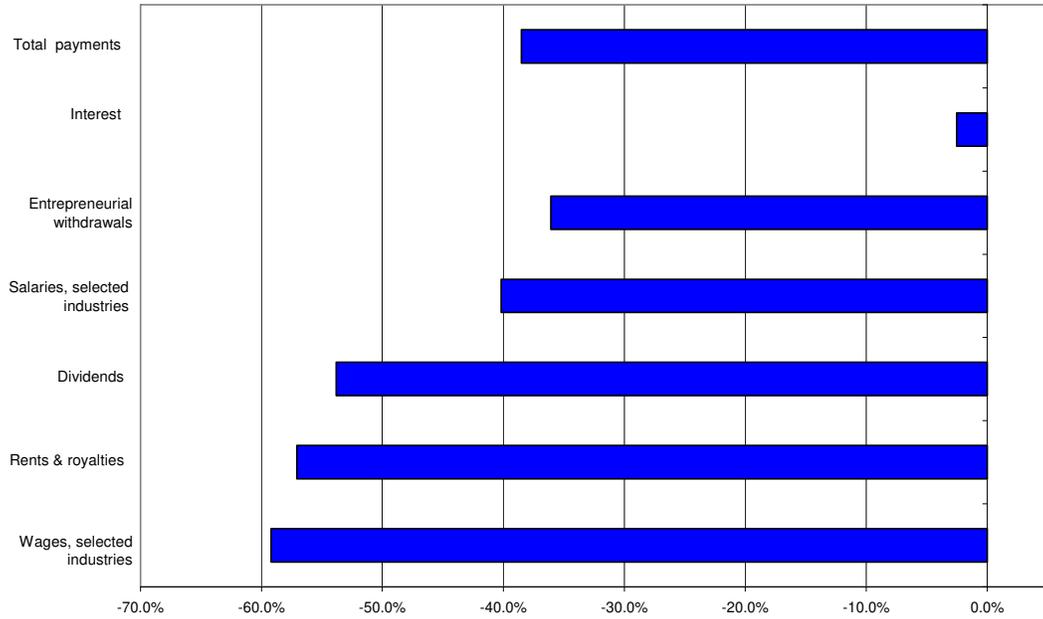
[In current dollars]



*From 1936 U.S. Department of Commerce report on national income

Figure 3

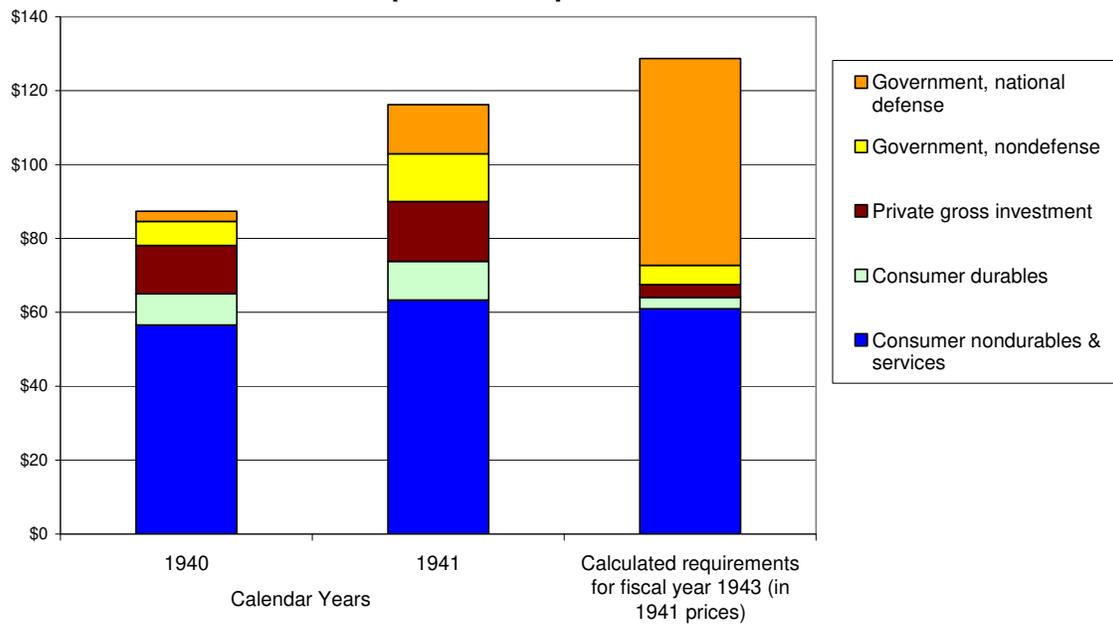
**Percent Change in *Income Paid Out* By Type of Payment
From 1929 to 1932**
[In current dollars]



*From 1936 U.S. Department of Commerce report on national income

Figure 4

**Utilization of GNP, 1940-41, and
Requirements of War Program for 1943**
[In billions of dollars]



*From March 1942 Survey of Current Business

Figure 5

Gross National Product (GNP) by Use [Billions of dollars]

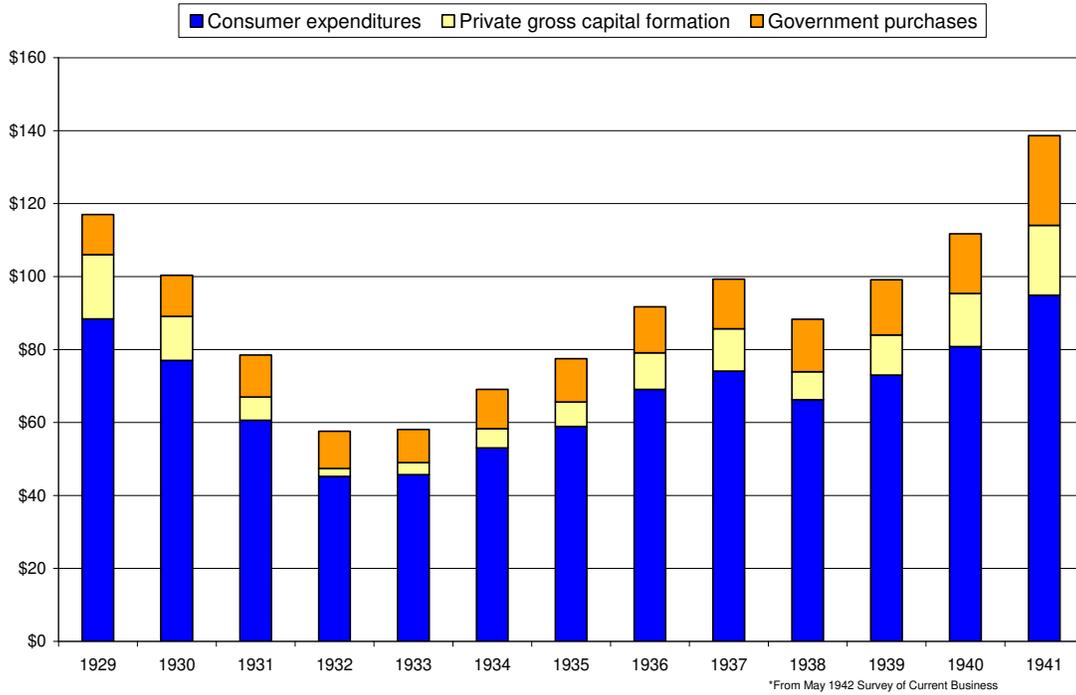


Figure 6

Business Taxes and Capital Depreciation, 1929-46 [Billions of Dollars]

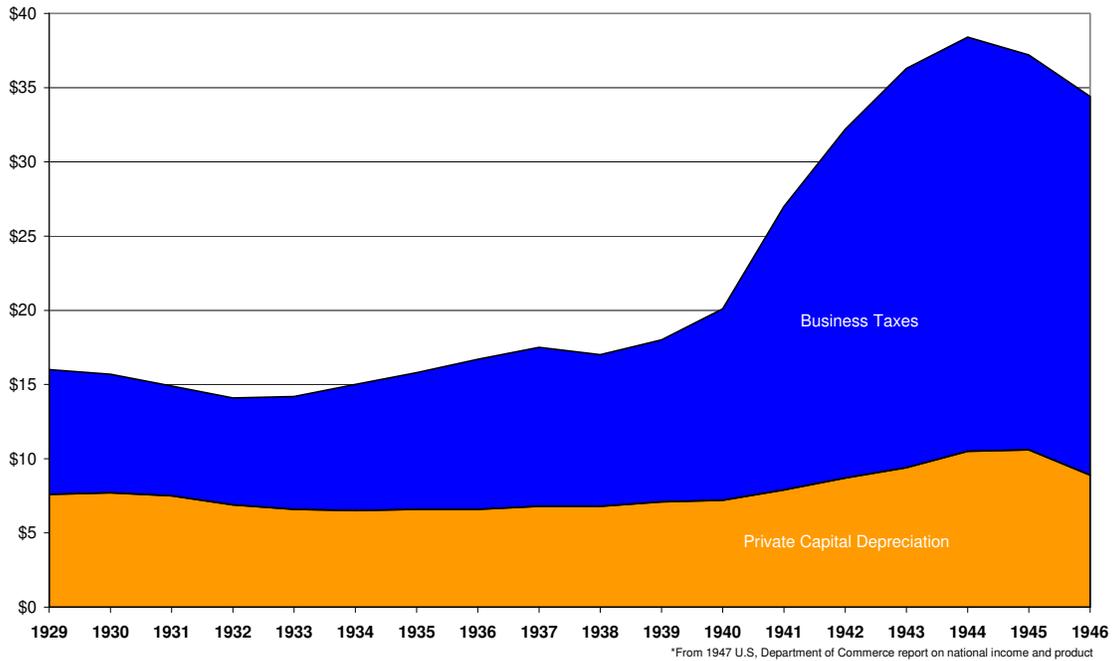


Table A

Gross National Product and Income, 1941

[Billions of dollars]

Relation of Gross National Product to National Income		
1	National Income	94.7
2	Plus: Total business taxes	17.6
3	Depreciation and depletion charges	7
4	Income credited to other business reserves	1.6
5	Capital outlays charged to current expense	1.8
6	Less: Revaluation of business inventories	3.2
7	Equals: Gross national product or expenditures	119.5

Gross National Product by Use of Product		
1	Gross National Product	119.5
2	Less: Government purchases of goods and services	24.6
3	Federal Government	16.4
4	National defense	11.2
5	Other	5.2
6	State and local governments	8.2
7	Equals: Goods and services available for private use	94.9
8	Less: Gross private capital formation	19.1
9	Construction	5.2
10	Producers' durable equipment	8.9
11	Net export of goods and services	0.9
12	Net export of gold and silver	-0.6
13	Net change in business inventories	3.6
14	Net change in monetary stock	1.1
15	Equals: Goods and services sold to consumers	75.8
16	Durable goods	10.3
17	Nondurable goods and services	65.5

National Income by Use of Funds		
1	National Income	94.7
2	Plus: Transfer payments from government	2.4
3	Less: Corporate Savings	2.6
4	Employment taxes	2.4
5	Direct personal taxes	3.8
6	Federal Government	2.1
7	State and local governments	1.7
8	Equals: Disposable income of individuals	88.3
9	Less: Consumer expenditures for goods and services	75.8
10	Equals: Net savings of individuals	12.5

Gross National Expenditure by Use of Funds		
1	Gross national expenditure	119.5
2	Less: Total taxes	23.8
3	Business taxes	17.6
4	Federal	10.8
5	Corporate	6.6
6	All other federal business taxes	4.2
7	State and local	6.8
8	State corporate income taxes	0.3
9	All other state and local business taxes	6.5
10	Direct personal taxes	3.8
11	Federal	2.1
12	State and local	1.7
13	Employment taxes	2.4
14	Less: Total gross savings	22.3
15	Corporate	7.2
16	Net savings	2.6
17	Depreciation and depletion	4.4
18	Other business reserves	1.3
19	Capital outlays charged to current expense	1.5
20	Revaluation of inventories	-2.6
21	NonCorporate	15.1
22	Net savings of individuals	12.5
23	Depreciation and depletion	2.6
24	Other business reserves	0.3
25	Capital outlays charged to current expense	0.3
26	Revaluation of inventories	-0.6
27	Plus: Transfer payments to government	2.4
28	Equals: Total consumer expenditures	75.8

Source: "Preliminary Estimates of Gross National Product, 1929-1941," Milton Gilbert and R.B. Bang, Survey of Current Business (May 1942)

Table B

National Income and Product Accounts, 1939
(published in 1947)

I. National Income and Product Account

[millions of dollars]

Line		Line		
1	Compensation of employees	47,820	22 Personal consumption expenditures	67,466
2	Wages and salaries	45,745	23 Gross private domestic investment	9,004
3	Supplements	2,075	24 Net foreign investment	888
4	Income of unincorporated enterprises and inventory valuation adjustment	11,282	25 Government purchases of goods and services	13,068
5	Rental income of persons	3,465		
6	Corporate profits before tax and inventory valuation adjustment	5,753		
7	Corporate profits before tax	6,467		
8	Corporate profits tax liability	1,462		
9	Corporate profits after tax	5,005		
10	Dividends	3,796		
11	Undistributed profits	1,209		
12	Inventory valuation adjustment	-714		
13	Net interest	4,212		
14	National Income	72,532		
15	Indirect business tax and nontax liability	9,365		
16	Business transfer payments	451		
17	Statistical discrepancy	462		
18	Less: Subsidies minus current surplus of government enterprises	485		
19	Charges against net national product	82,325		
20	Capital consumption allowances	8,101		
21	CHARGES AGAINST GROSS NATIONAL PRODUCT	90,426	26 GROSS NATIONAL PRODUCT	90,426

II. Consolidated Business Income and Product Account

[millions of dollars]

Line		Line		
1	Compensation of employees	38,011	26 Consolidated net sales	78,877
2	Wages and salaries	36,250	27 To consumers	63,816
3	Disbursements	36,250	28 To government	5,375
4	Excess of accruals over disbursements	0	29 To business on capital account	8,563
5	Supplements	1,761	30 To abroad	1,123
6	Employer contributions to social insurance	1,330	31 Change in inventories	441
7	Other labor income	431		
8	Income of unincorporated enterprises and inventory valuation adjustment	11,282		
9	Rental income of persons	3,465		
10	Corporate profits before tax and inventory valuation adjustment	5,569		
11	Corporate profits before tax	6,283		
12	Corporate profits tax liability	1,462		
13	Corporate profits after tax	4,821		
14	Dividends	3,659		
15	Undistributed profits	1,162		
16	Inventory valuation adjustment	-714		
17	Net interest	3,284		
18	Income originating	61,611		
19	Indirect business tax and nontax liability	9,365		
20	Business transfer payments	451		
21	Statistical discrepancy	462		
22	Less: Subsidies minus current surplus of government enterprises	485		
23	Charges against net product	71,404		
24	Capital consumption allowance	7,914		
25	CHARGES AGAINST BUSINESS GROSS PRODUCT	79,318	32 BUSINESS GROSS PRODUCT	79,318

