

THE HISTORY OF THE UNITED STATES NATIONAL INCOME AND PRODUCT ACCOUNTS: THE DEVELOPMENT OF AN ANALYTICAL TOOL*

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The purpose of this article is to record the history of the national income and product accounts of the United States, concentrating on the period 1932–47. During that period the single national income aggregate evolved into a set of accounts and the estimates emerged as an important analytical tool. Interviews with participants in these developments were extensively utilized to trace the events, people, ideas, and other factors which shaped the history of the accounts.

The generally recognized need for economic information during the Great Depression stimulated the request that the Department of Commerce undertake what became the first official continuing series on national income in the United States. These estimates were prepared with the cooperation of the National Bureau of Economic Research and were published in 1934. By the late 1930's, estimates were extended to include income by state and a monthly series. World War II was the impetus for the development of product, or expenditure, estimates. By the mid-1940's, the estimates had evolved into a set of income and product accounts—a consolidated production account, sector income and outlay accounts, and a consolidated saving-investment account—designed to provide a bird's-eye-view of the economy. During this period uses of the accounts widened; analysis of wartime production goals and anti-inflation policy are noteworthy examples. The *National Income, 1947 Edition* was the culmination of a period of intensive conceptual discussion, extension of data sources, and improvement of estimating techniques. Thereafter the mainlines of development are more familiar, encompassing refinement and elaboration of the estimates and proliferation of uses.

The development of national income estimates in the various countries since the time of Sir William Petty's estimate in 1665 was surveyed in a recent article by Kendrick. Of necessity his article dealt summarily with the national income accounts of the United States.¹ The purpose of this article is to record in greater detail the history of those accounts. Two aspects of this history will provide the major themes: the unfolding of the single national income aggregate into a set of income and product accounts, and, closely attendant upon that, the development of national income and product estimates into an analytical tool of the first order of importance to government and private economists.

EARLY ESTIMATES: A BRIEF SUMMARY

Prior to World War I, published national income estimates were the work of individual investigators. Chief among these individuals were George Tucker, who published his estimates in 1843 and 1855; Ezra C. Seaman, in 1852; Charles B. Spahr, in 1885; and Willford I. King, in 1915. The decennial censuses, which after 1840 were expanded to include more detail on industry, were the major data sources. Reflecting these data, most estimates were compiled, by industry, as the

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¹John W. Kendrick, "The Historical Development of National-Income Accounts," *History of Political Economy*, II (Fall, 1970), 284–315, and especially 306–307.

sums of value added, that is, as the sums of the net contribution by industry. A continuing thread of interest among the investigators was public finance, for the estimates were often compiled to cast light on the burden of the public debt or the efficacy of various taxes.

During World War I and the 1920's, interest in national income estimates spread, and increasingly the estimates were prepared by organizations rather than individuals. The war prompted what appears to be the first instance in the history of the U.S. estimates of preparation and analytical use by a high government official. At that time Adolph C. Miller, an able economist who served on the Board of Governors of the Federal Reserve System from 1914 to 1936, noted that no official or authoritative estimates of the current "annual income of the people of the nation" were available. He prepared estimates in order to evaluate the "surplus over necessary consumption and maintenance of capital that could be devoted to the war effort."²

Also during this time several attempts were made to provide approximate annual estimates on a current basis. These attempts were significant because until current estimates are available, the estimates remain largely of historical interest. In 1917 B. M. Anderson, Jr. began to publish well-regarded estimates. At first he used railroad gross receipts and wholesale prices to carry forward King's estimate for 1910.³ Ten years later the National Industrial Conference Board began regular publication of a national income series prepared by moving forward a base year estimate by six indexes of the gross value of output.⁴ An early article by David Friday is notable because it provided not only relatively current estimates but also a forecast of national income for the following year.⁵

The National Bureau of Economic Research undertook as its first project a study of national income—its size, year-to-year variation, and distribution. The purpose was to provide impartial and trustworthy estimates to be used as a basis for popular consideration of social and political problems. The National Bureau authors, Wesley C. Mitchell, Willford I. King, Oswald W. Knauth, and Frederick R. Macauley, produced two volumes showing income in current and constant dollars for the years 1909–19, using data on both sources of production and income received.⁶ The clearly set forth definitions, sources, and methods constituted an advance toward making national income estimating an increasingly professional endeavor. Later, during the 1920's, a distribution of income by state was completed, and the annual, national estimates were revised and carried forward.

The first national income estimates prepared by an agency of the Federal government were published by the Federal Trade Commission (FTC) in 1926.⁷

²Adolph C. Miller, "War Finance and Inflation," *Annals*, January, 1918, pp. 113–34.

³B. M. Anderson, Jr., "Nation on a Sound Basis Despite Troubles of Last Year," *Annalist*, January 3, 1921, pp. 9–10 and 26.

⁴"Estimates of National Wealth and Income," *Conference Board Bulletin*, No. 5 (May, 1927), 33–40.

⁵David Friday, "The Taxable Income of the United States," *Journal of Political Economy*, XXVI (December, 1918), 952–69.

⁶Wesley C. Mitchell, *et al.*, *Income in the United States: Its Amount and Distribution, 1909–1919, I and II* (New York, 1921 and 1922).

⁷U.S., Congress, Senate, *National Wealth and Income*, a report of the Federal Trade Commission, S. Doc. 126, 69th Cong., 1st sess., 1926.

This report was prepared under the direction of that agency's chief economist, Francis Walker. Walker was exceptional for the time in his advocacy of an expanded role for the Federal government in economic data collection. One of the staff members, G. P. Watkins, had prior interest in empirical studies of income and wealth. Estimates of value of product by industry for the years 1918–23 were provided. Little theoretical discussion was included in the report, and the estimates contained few of the then controversial items. The value of housewives' services, for example, was excluded. Work on national income estimates was terminated when FTC funds for general investigative studies were curtailed. When the FTC discontinued this work, no other agency picked it up. This lapse may be interpreted to show that the Federal government was not yet ready to take the responsibility of gathering and processing fundamental economic data.

THE BEGINNING OF NATIONAL INCOME ESTIMATES BY THE DEPARTMENT OF COMMERCE

As the economy sank into the Great Depression in 1930–31, the national income estimates most commonly cited were those prepared by the National Bureau of Economic Research and the National Industrial Conference Board. Except for the preliminary estimates prepared by King, the National Bureau's laborious procedure yielded estimates only with a lag of many months. The Conference Board's estimates, although available more quickly, provided only a single total moved forward on the basis of gross values. In 1931, Government and private experts were called to discuss the current economic situation in Congressional hearings; they were unable to provide national income figures for later than 1929. Further, national income estimates had found little use in business cycle analysis and forecasting, for the available estimates were neither current nor provided on a quarterly or monthly basis.

In February, 1932, two groups interested in pursuing information on the national income were brought into contact with each other. On one hand were officials of the Commerce Department's Bureau of Foreign and Domestic Commerce (BFDC) and on the other, what was known as the La Follette group, which included Isador Lubin, an economic adviser to Senator Robert M. La Follette, Jr. A staff memorandum to Bureau Director Frederick M. Feiker refers to a possible Senate request for a study of national income, also referred to as "buying" or "purchasing power" surveys. Feiker was concerned about the lack of data on "purchasing power," and agreed with the La Follette group that "new purchasing-power, and standard-of-living surveys are more needed than studies on any other economic subject."⁸ As a result of a May meeting between Lubin and Feiker, "a resolution will be offered in Congress (Senate) as soon as the present emergency measures are concluded that will call upon some government department to make a study of national income and purchasing power. . . . In its present form it directs that the survey shall be made by the Department of Commerce,

⁸National Archives, Record Group 151, Frederick M. Feiker File, memorandum to Feiker from Calvert Judkins, dated February 24, 1932.

although some are in favor of having the work done by the Federal Trade Commission.”⁹

On June 8, 1932, that resolution was introduced by Senator La Follette. It read, in part:

RESOLVED, That the Secretary of Commerce is requested to report . . . estimates of the total national income of the United States for each of the calendar years 1929, 1930, and 1931, including estimates of the portions of the national income originating from agriculture, manufacturing, mining, transportation, and other gainful industries and occupations, and estimates of the distribution of the national income in the form of wages, rents, royalties, dividends, profits, and other types of payments. These estimates shall be prepared by the Bureau of Foreign and Domestic Commerce . . .¹⁰

Senator La Follette’s research assistant, Paul Webbink, recalls that Lubin approached him about introduction of such a resolution, and Senator La Follette was easily persuaded of its merits. Webbink probably wrote the resolution and La Follette’s remarks accompanying its introduction.¹¹

The resolution *per se* and any one person’s role in initiating the official work on national income should not be exaggerated. Such a step was “in the air,” for it was “a convenient and logical method of broadening our knowledge of the national economy,” considering the “crisis situation existing at that time and the almost complete lack of reliable data upon which to make major policy decisions regarding what the government could and should do to improve the economic outlook.”¹²

Probably by prearrangement, the task of preparing the estimates was assigned to the Economic Research Division of BFDC. J. Frederic Dewhurst was chief of that division; it was probably in part his excellent reputation that brought the task to the Department of Commerce. During the summer of 1932 two persons were assigned to the project.¹³ By November it was apparent that Dewhurst would not be returning from a special leave to take charge of the study. Subsequently an agreement was worked out with the National Bureau of Economic Research by which Simon Kuznets, a member of its staff, assumed the study’s direction and that organization was to cooperate in carrying the study through to completion.

Kuznets had joined the National Bureau in 1929, while King’s method of estimating national income was being followed. King himself left shortly thereafter. Immediately Kuznets was launched on the project that eventually became his well-known article, “National Income,” for the *Encyclopedia of the Social*

⁹National Archives, Record Group 151, Frederick M. Feiker File, memorandum to Feiker from E. R. Dewey, dated May 3, 1932.

¹⁰S. Res. 220, 72nd Cong., 1st sess., *Congressional Record*, LXXV, 12285.

¹¹Paul Webbink. Telephone interview, October, 1969.

¹²The quotations are from, respectively, Simon Kuznets, interview in Cambridge, Massachusetts, October, 1969; letter from Amos E. Taylor, June 30, 1969; and letter from E. A. Tupper, January 9, 1970.

¹³What follows relies largely upon “Memorandum on the History and Progress of the Study of National Income for 1929–32” attached to a letter from Simon Kuznets to Dr. Willard L. Thorp, dated September 7, 1933. National Archives, Record Group 151, Willard L. Thorp File.

Sciences.¹⁴ About 1930, National Bureau leaders decided on a careful revision of the methods used in preparing the national income estimates and placed Kuznets in charge. Kuznets submitted plans for a very thorough study by new methods in February, 1932. The plan incorporated two principles: first, clarification of definitions used, allowing the user alternative definitions where possible, and, second, citation of original data sources to show precisely how the estimates were derived.¹⁵ Thus, Kuznets was in a strong position to launch a study of national income, even though he had not yet had actual estimating experience in that field.

Kuznets officially went to work with the Economic Research Division in January, 1933.¹⁶ He found that very little had been accomplished. During most of the preparation period, no more than three “senior assistants” were engaged in the study in Washington at any one time. Robert F. Martin and Robert R. Nathan, the latter a former student of Kuznets’, were among these. On average, five statistical clerks also participated in Washington. At the National Bureau in New York, two assistants, one of whom had previously worked on King’s estimates, were engaged about half time each.

As the preliminary estimates were worked out by industrial grouping, the data and estimates were recorded by hand in “entry books.” The completed entry books were sent to the National Bureau for checking and revision. The books often made several trips until gaps and questions were eliminated. The final estimates were then typed on “basic tables.” The basic tables contained these estimates, their derivation, and notes on the sources of data. By November, 1933, most of the industry estimates had been completed. The final months were devoted to finishing the estimates and writing the text of the report, the latter “a comparatively simple task once the text tables are prepared.”¹⁷ The report was submitted to the Senate on January 4, 1934, approximately one year after Kuznets took charge of the study.

National Income, 1929–32 was printed as a Senate Document.¹⁸ Chapter I of the 261-page report defined the specific aggregates measured, discussed some of the uses and abuses of national income estimates, and summarized the sources, methods, and resulting accuracy of the figures. This statement largely was the framework within which the Department of Commerce estimates were prepared throughout the 1930’s. Two “national income” aggregates were defined, marking the beginning of several years’ debate on terminology. “National income produced” was used to refer to the net product of the national economy. The total of compensation in money or in kind for efforts in producing the net product was called “national income paid out.” In general terms, the difference between national income produced and national income paid out is that the former includes savings by business establishments, but the latter does not.

¹⁴Vol. 11 (New York, 1933), 205–24; reprinted in *Readings in the Theory of Income Distribution*, selected by William Fellner and Bernard F. Haley (Homewood, Ill., 1951).

¹⁵Simon Kuznets. Interview in Cambridge, Massachusetts, October, 1969.

¹⁶What follows is based on Kuznets’ “Memorandum on the History and Progress of the Study of National Income for 1929–32.”

¹⁷*Ibid.*, p. 8.

¹⁸U. S., Congress, Senate, *National Income, 1929–32*, S. Doc. 124, 73rd Cong., 2d sess., 1934. Hereinafter referred to as *National Income, 1929–32*.

The scope of the national income measurement was conservative in that some of the items that might have been added to the total were excluded. Two factors help to explain this conservatism. First, the Commerce Department was feeling its way in this field and because this was a new venture for a government agency (excepting the short-lived efforts of the Federal Trade Commission) general approval was important. Also, the National Bureau had planned to retreat from some of King's estimates to ground more securely buttressed by reliable data. Thus the following items were excluded from national income: services of housewives and other members of the family; services of consumer-owned durable goods; earnings from odd jobs; relief and charity; change in the value of assets; and earnings from illegal pursuits.

Use of the national income estimates to investigate the productiveness of the nation, movements in economic welfare, and the relative weight in the total of various "drafts" on national income were described in the very broadest strokes. But, the report cautioned, these are highly valuable uses only if the results are interpreted with full realization of the definition assumed by the measurement: the estimates cover primarily the market economy; they are valued at market prices, which are affected by the income distribution; and they are based in part on legal and accounting distinctions between net and gross income of business enterprises. Additional problems arise when the results are interpreted from the point of view of economic welfare: welfare cannot adequately be measured unless the personal distribution of income is known and account is taken of the costs of earning income. Thus, the report concluded, welfare can scarcely be inferred from national income as defined.

The method used was to build up estimates of income created by industry by type of payment. This was done by summing payments by business units to individuals, and where necessary, tabulating incomes received by individuals. These results were summarized in a chapter statistically interpreting the Depression in terms of these estimates. No attempt was made to convert the estimates to constant prices, because it could not be done in a satisfactory fashion. Thereafter the bulk of the report showed tabulations, by industry and type of payment. The appendixes showed sources and methods, providing a line-by-line derivation of the text tables. Such a comprehensive statement of statistical sources has seldom been approached in later national income estimates.

Even before the report to the Senate was completed, movement was underway to put national income measurement on a permanent basis at the Commerce Department. A memorandum of November, 1933, to the Director of BFDC Willard L. Thorp presented the case for a continuous study by a government agency. The usefulness of the estimates in the determination of policy, such as tax policy, was noted. It was suggested that as the element of planning in economic life becomes larger, the study of national income becomes of increasing importance. Advantages of government preparation were stressed: government agencies had access to a wider variety of sources than private agencies and were in a better position to ensure comparability of the estimates over time.¹⁹

¹⁹National Archives, Record Group 151, Willard L. Thorp File, memorandum to Thorp from N. B. Engle, dated November 3, 1933.

Apparently, there was never much doubt about continuation of the study. Earlier Thorp himself had made an elaborate collection of national income estimates for the National Bureau and was thoroughly familiar with the need to shift the responsibility to the government.²⁰ Further, the prestigious Committee on Government Statistics and Information Services, an independent advisory panel sponsored by the American Statistical Association and the Social Science Research Council, and the chairman of the Central Statistical Board urged that national income studies become a continuing BFDC program.

The Annual Report of the Commerce Department refers to the “keen and widespread” interest the national income report evoked. An article summarizing the report inaugurated the “special” articles that reported the Department’s economic research activities in the *Survey of Current Business*. A shorter summary built around the tables of national income paid out and national income produced was carried in various government publications and in the press. Within eight months after *National Income, 1929–32* was printed, almost 4,500 copies had been sold at \$0.20 each; this was almost 800 more than sales of the *Statistical Abstract* of that year.

After the initial report Kuznets returned to the National Bureau. The work at the Department of Commerce was placed in charge of Martin and Nathan successively. Annual articles in the *Survey of Current Business* were the major means of placing the estimates before the public. In 1936 a publication similar to *National Income, 1929–32* updated the estimates and incorporated some changes in sources and methods. This work was carried out by a staff little different in size and composition from that which prepared the initial report.

Two major extensions of national income estimates, a monthly series and a distribution by state, were completed by the Commerce Department within a few years. In both cases the desirability of the work was well recognized, but the limited size of the national income staff dictated that it be carried on intermittently as production of the annual, national series permitted. Completion was delayed until 1938 for the monthly series and until 1939 for the distribution by state.

The Commerce Department’s “monthly income payments” corresponded definitionally to the income paid out, and so provided a preliminary measurement of that aggregate. Further, it was designed to serve as an indicator of changes in general economic activity and—less satisfactorily—in buying capacity of individuals. A monthly measure was in demand; several other government agencies already had begun putting together their own estimates. Eight months after the original monthly series was introduced the concept was revised. Rather than corresponding definitionally to the national income paid out, the necessary adjustments—largely dealing with transfer payments—were made to more closely approximate actual payments to individuals. Frederick M. Cone, who had major responsibility for developing the methods and techniques for the series, attributes the change in concept to two factors: first, the magnitudes of the adjustments were becoming greater, and, second, the prevailing analysis of the depression of 1937–38 placed increased emphasis on the purchasing power of individuals.²¹

²⁰Letter from Willard L. Thorp, December 25, 1969.

²¹Frederick M. Cone. Interview in Washington, D.C., November, 1969.

The delineation of the resulting aggregate, which was called income payments to individuals, was an important conceptual step. Previously, the focus of national income work had been on defining a *single* aggregate, i.e., some form of national income. With that focus, the propriety of including certain items, relief payments, for example, had been debated. The increased volume of relief and other transfer payments during the Depression intensified the need to resolve the issue. The definition of an additional aggregate—one measuring current factor payments plus various transfers to individuals—helped to accommodate the different viewpoints. Income payments to individuals became one of the five major aggregates defined by the Department of Commerce. Further, recognition of “individuals” as a separate group is an important step; it leads to the explicit recognition of other groups, their incomes and outlays, and to a set of sector income and outlay accounts.

In May, 1939, a bulletin prepared by Nathan and John L. Martin presented total income, income per capita, and a breakdown by type of payment for each state. In addition to business interest in such estimates for marketing studies, relief agencies and the Social Security Board were active in promoting them as a basis of allocating Federal grants to states. These estimates were prepared annually thereafter, and the statistical procedures worked out remained basically unchanged until the mid-1950's.

During the 1930's the uses of the national income estimates expanded rapidly. Probably most common was their citation as an indicator, or barometer, of economic activity. This, of course, filled a major need of the time, for, as was suggested above, information on the course of the Depression, as well as its effects on different population groups, was inadequate. Illustrative of this use, and also suggesting increased popular familiarity with the measurements, are references in President Roosevelt's 1936 campaign speeches to the increases in national income “from about thirty-eight billion dollars in 1932 to well over sixty billion dollars in 1936.”²²

During the early and mid-1930's quantitative analysis using national income estimates was essentially micro-economic. Both the Department of Agriculture, working on correlations with retail expenditures for selected agricultural products, and the National Recovery Administration, in working out demand relations for the gasoline, shoe, textile, and several other industries, used national income aggregates in this way.

By the late 1930's greater sophistication in the uses is apparent, reflecting the impact of macro-economic theory, the greater detail in the available estimates, and the lengthened time span over which consistent series were available. There are several noteworthy examples. The National Resource Committee's *Patterns of Resource Use* attempted to discover what level of economic activity would absorb unemployment and what the market demand for the various industries would be at that level. National income and its components were used to aid in forecasting Federal tax yields. The “offset to savings” formulation of the full employment

²²Franklin D. Roosevelt, *The Public Papers and Addresses of Franklin D. Roosevelt*, Vol. 5: *The People Approve* (New York, 1938), p. 428. See also pp. 180-81 and 402-403.

problem highlighted the possibility of alternative policies and helped quantify the magnitude of the problem (see below).²³

PRODUCT ESTIMATES

The Initial Product Estimates in the 1930's

In his article, "National Income," published in 1933, Kuznets noted that no country had continuous and reliable series on the volume of consumers' expenditures or savings. This method of estimating national income was used less than the other two standard methods—by industry and by income type—because the data called for were not generally available. In a prophetic closing statement Kuznets said: "In the future, however, this method may come into greater prominence, for it is increasingly appreciated that a study of the various ways in which income is spent or saved is an essential aid in dealing with a number of pressing economic problems."²⁴

The estimate of output in terms of kind of expenditure, that is, the well-known "C + I + G" approach to estimating, has come to be considered part and parcel of the Keynesian-type theory of income determination. This close connection did not always exist. In the United States, in the 1930's, estimation of the output of commodities and services progressed along three main lines, all three of which were independent of the Keynesian thinking at the time the studies were begun.²⁵ These three efforts—by Clark Warburton, Simon Kuznets, and Lauchlin Currie and his associates—will be described below. Thereafter the rapid development of the Commerce Department product estimates during World War II will be traced.

Of the three sets of estimates, Warburton's was begun first, in 1932. Warburton worked out his estimates of the product components of the national output while participating in the Brookings Institution study on the "Distribution of Wealth and Income in Relation to Economic Progress." In one of the volumes produced in the course of that study, *America's Capacity to Consume*, the authors analyzed and extended when possible the available estimates of national income, the distribution of income by size, and the data on utilization of family income. In addition Warburton prepared the estimates of consumption based on consumer surveys, and worked up estimates using data from the various censuses and trade sources. He had prepared a manuscript and a statistical appendix based on the latter method, but in the end they were not published.

After it became evident that funds were lacking for further investigation, Warburton prepared another manuscript to pull together some of his estimates and analysis relating to the value of consumption and capital formation.²⁶ The

²³An interesting review of these applications appeared in an unpublished paper by Oscar L. Altman and Thomas C. Blaisdell, Jr., bound for private circulation in *Papers on National Income*, New York, 1941.

²⁴Kuznets, "National Income," pp. 214–15.

²⁵There were additional candidates for inclusion in this review, but to differing degrees the increasing professionalism of national income estimating placed them outside the mainstream.

²⁶A slightly revised version of the manuscript originally prepared in the summer of 1934 is in Warburton's possession and was graciously loaned to the writer.

manuscript's first section surveyed the gross social product, or gross national product, as he called the final products which emerge from the productive and marketing processes to be passed on to consumers or to business concerns. At that time estimates in detail had been prepared for 1929, and for the census years 1919 through 1927. His tables subsequently provided the bases for two journal articles.

Warburton's summary table, "Composition and Value of the Gross National Product, 1929," separated consumers' goods and services, and capital goods, with detail for each. His 1929 total of \$103.6 billion was "considerably larger" than the national income estimates by King, Kuznets, and others. The difference, he noted, was chiefly due to the inclusion in gross national product of "(a) capital items purchased from depreciation and depletion allowances, and (b) the cost of all governmental services rendered to persons and governmental expenditures for capital purposes without allowance for the 'inflation' or duplication of values which may result from taxation processes."²⁷

The article "How the National Income was Spent 1919-29" argued that the value of gross national product, adjusted to omit depreciation, i.e., what today we would call the net national product, was the appropriate aggregate to use when computing the percentages of a national income aggregate devoted to various purposes. He went on to calculate such percentages for the major components. He noted that three particularly important facts were revealed.

- (1) A high degree of stability in the percentages of the national income spent for the various categories of consumers' goods and services during the period 1923-29.
- (2) A sharp decline in the percentage spent for food and a sharp rise in the percentage spent for shelter and home maintenance, from 1919 to 1921—changes presumably due to variations in relative values rather than to variations in the physical volume of purchases.
- (3) Much sharper fluctuations in the percentages spent for capital items than for consumers' goods and services.²⁸

It is interesting to reflect that until this time—1934 or thereabouts—there were no "measures," even in the loose sense in which the early estimates were measures, of such basic facts as the stability of consumer spending relative to capital expenditure.

Warburton's 1934 article appears to be the first use in print of the term gross national product. Although Warburton affirms that this was probably so, he points out that, first, he was not especially attached to the term; he used several others, such as total value of final products, to mean the same thing. Second, he disliked use of "gross national product" without the qualifying "value of," for he believed that without "value of" the concept could be mistaken for a physical quantity measure.²⁹

²⁷Clark Warburton, "Value of the Gross National Product and Its Components, 1919-1929," *Journal of the American Statistical Association*, XXIX (December, 1934), 384 and 387-88.

²⁸Clark Warburton, "How the National Income was Spent 1919-29," *Journal of the American Statistical Association*, XXX (Supplement: March, 1935), 178.

²⁹Clark Warburton. Interview in McLean, Virginia, April, 1970.

In retrospect, Warburton was in the forefront in seeing the need for and arguing the merits of product estimates. For example, at a professional meeting in 1936, he catalogued four areas in which they would be especially valuable: to show most clearly the essential characteristics of business fluctuations; to reveal the gradual alterations in the economy of energies devoted to each kind of end product; to facilitate studies of productive capacity; and to aid in placing adequate emphasis upon the fact that policies should be devoted to furnishing the people with the kind of goods and services they want.³⁰ Believing thus in their usefulness, Warburton pursued support for his investigations up until the Commerce Department work on product estimates was begun.

Simon Kuznets produced a second set of product estimates. Kuznets' work got underway at the invitation of David Friday. In the spring of 1933, the Credit and Banking Committee of the Social Science Research Council, chaired by Friday, was formulating a series of studies on the relation of banking and credit control to economic stability. Friday, also a director of the National Bureau, approached Kuznets about preparing a study of durable goods and capital formation, upon which Friday himself had already done some preliminary work.³¹

An article Friday published in 1933 outlined his motives for sponsoring the National Bureau's project on capital formation. He noted that although the importance of the distinction between the acquisition of things for wealth stock and consumption had long been recognized, up to that time there was "no satisfactory statistical determination of the division of income as between these two categories of capital formation and consumption."³² He believed that stability could not be achieved unless the process of capital formation could be freed from its wide variations. Before much progress could be made in eliminating the variations, more precise information was needed about the volume, composition, and fluctuations of capital formation.

With this background, Kuznets' work on estimates of gross capital formation began in the spring of 1933. Mimeographed preliminary results were available for confidential circulation in March, 1934. In November of that year his article on gross capital formation appeared in the National Bureau's *Bulletin*. In 1937 a preliminary summary of the capital formation study and the revision of King's series on national income, making complementary use of Solomon Fabricant's work on capital consumption, was presented in *National Income and Capital Formation, 1919-1935*.³³

³⁰The Washington Statistical Society, proceedings of the annual meeting, May 30, 1936. *Journal of the American Statistical Association*, XXXI (September, 1936), 573-74.

³¹Simon Kuznets. Interview in Cambridge, Massachusetts, October, 1969. Besides crediting Friday with initiating this work, Kuznets recalls Friday's innovative thought in other aspects of national income. For example, Friday made a suggestion which did not come to fruition for almost fifteen years. In 1928 he had proposed that national income be used as the point of departure for the organization and interpretation of an introductory course in economics. He wrote: "The concept of the national income, its size, composition, and variation, its distribution, and its final disposition or use, would seem to furnish the most promising point of departure . . . A pretty clear notion of the meaning and size of the national income . . . would . . . throw much of our complex economic process into perspective . . ." David Friday, "The Needs of an Elementary Course in Economics," *Journal of Home Economics*, XX (August, 1928), 546-47.

³²David Friday, "The Formation of Capital: Measurement and Relation to Economic Instability," *American Economic Review*, XXIII (Supplement: March, 1933), 91.

³³Simon Kuznets, *National Income and Capital Formation, 1919-1935* (New York, 1937).

By the time of that publication Kuznets used the term “gross national product” and, of several possible concepts, the one he considered most important was defined as the value of commodities and services produced, gross of the value of durable capital goods consumed in the process of production, but net of the raw materials, partly fabricated products, and fuel consumed. The total for gross national product was arrived at by adding to national income, which he estimated as the aggregate of all income paid to individuals plus net savings of all enterprises, the amounts previously deducted as representing the current consumption of durable capital goods.³⁴ Redefining gross national product to consider its apportionment “at the stage of consumption,” national product is the sum of “(a) the value of finished commodities and services reaching their destination; (b) changes in stocks of all finished commodities not at their destination (in circulation) and of all other commodities; (c) the net change in claims against foreign countries, this item representing the fullest measure of the net product flowing out of the country.”³⁵ The difference between net and gross national product lies in the scope of item (b). In the case of gross national product, it covers net changes in stocks of raw materials, semifinished products, and finished products in the hands of enterprises, but in the case of capital equipment, gross changes in the stock are taken.

Kuznets’ major apportionment is between “consumers’ outlay” and “capital formation.” In the above definition, item (a) represents “consumers’ outlay” and “capital formation” is the sum of items (b) and (c), with (b) measured gross. Because, as mentioned above, Kuznets’ study was aimed at a direct measurement of capital formation, consumers’ outlay was obtained as a residual.

The measurement of gross and net capital formation was done by a combination of the “flow-of-goods” methods and the “change-in-stock” method. In the case of the former, this involves, first of all, a careful classification of all commodities to segregate net output without duplication, and then segregation, within net output, of those commodities that are part of capital formation.³⁶ Different assumptions as to whether certain purchases should fall within capital formation or consumers’ outlay provided opportunities for several possible variants, of which Kuznets provided estimates for three.

In apportioning gross national product between consumers’ outlay and capital formation, Kuznets did not feel that the data were adequate to show annual estimates and study annual differences. Thus three-year moving averages were calculated, and comparisons confined to the smoothed series. These were calculated in both current prices and 1929 prices.

Of the three studies under discussion, Kuznets’ was by far the most elaborate. The recognition it received was enhanced by the fact that it was part of a larger group of National Bureau studies with which its estimates were to some degree consistent. As will be noticed below, Kuznets’ totals, or in some cases only specific

³⁴ *Ibid.*, p. 5.

³⁵ *Ibid.*, p. 34.

³⁶ This was detailed by Kuznets in *Commodity Flow and Capital Formation* (New York, 1938). It served as the model for the development of commodity flow methods used by the Department of Commerce.

components, were utilized widely by government agencies as well as by private researchers.

The work initiated at the Board of Governors of the Federal Reserve System by Lauchlin Currie, the Assistant Director of Research and Statistics, and later carried on by others, notably V Lewis Bassie, is distinguished from the two other sets of estimates because it was specifically designed to aid in policy analysis.

Currie was the intellectual leader of the “spenders” in Washington whose ideas were pre-Keynesian in origin.³⁷ In 1934 Currie, with the assistance of Martin Krost, began calculating a series which was first called the “pump priming deficit” of the Federal government. In early 1935 this adjusted deficit was estimated, projected, and then related to national income in order to evaluate the effectiveness of government efforts to end the Depression.³⁸ Krost, under Currie’s direction, continued to add analytical detail and remedy defects of the “pump priming deficit,” and later refined it into a statistical series called “the net contribution of the federal government to national buying power,” or the “net contribution” for short. This net contribution of an economic unit was to be measured in terms of the excess of its income-increasing expenditure (cash disbursements which directly or indirectly go into the community cash income through the purchase of current output) over its income-decreasing receipts (drafts on disposable cash income that otherwise could have been spent on current output).³⁹

Until near the end of the 1930’s, indeed until the 1937–38 recession stimulated afresh the search for viable explanations, fiscal policy discussion had centered on the regular Federal budget estimates. As compensatory fiscal policy emerged, attention turned to the net contribution as the relevant measure of fiscal stimulus. Fiscal policy was related to the net contribution in an over-simplified manner, yet even so it was significant, because in the analysis it was necessary to consider current estimates of national income, saving, and other aggregates.

Subsequently the net contribution was incorporated into the broader “income producing expenditures that offset saving.” In the process of calculating these “offsets to saving” and relating them to national income aggregates, the economists at the Federal Reserve moved deeper into product component estimation. They developed, by original estimation or by adjustment and combination of data from other sources, the following major offsets to gross saving: expenditure on plant and equipment charged to capital account; private housing expenditures; value of the change in inventories; net additions to disposable cash income attributable to public bodies; net foreign balance on current account; and net change in consumer credit.⁴⁰

³⁷Herbert Stein, *The Fiscal Revolution in America* (Chicago, 1969), p. 165.

³⁸Lauchlin Currie, “Comments on Pump Priming,” 1935, a memorandum prepared for Marriner Eccles. (Typescript in Currie’s possession.)

³⁹Martin Krost, “The Measurement of the Net Contribution of the Federal Government to National Buying Power” (Federal Reserve Board research memorandum, August 16, 1938). (Mimeographed.)

⁴⁰Lauchlin Currie, testimony, in U.S., Congress, Temporary National Economic Committee, *Investigation of Concentration of Economic Power, Hearings, Part 9, 76th Cong., 1st sess., 1939*, pp. 3523 and 4015–18.

This type of analysis was the foundation of the presentation made by Alvin Hansen and Currie at the Temporary National Economic Committee hearings in May, 1939. Their testimony was instrumental in introducing Keynesian thinking to popular Washington economics. Currie's testimony, the culmination of the previous four years' work, provided the statistical support. His tables and charts presented the historical magnitudes of these various offsets, and then related them to gross national income. He pieced together Kuznets' figures for gross national product (less the items of imputed rent and gross savings of government) for the years 1921–35 and a series "based on national income data of the Department of Commerce" for 1935–38. A series on net national income was also shown.⁴¹

Later in 1939 the scene and characters shift somewhat. Currie became one of the administrative assistants to the President. At the Department of Commerce, Secretary Harry Hopkins was setting up an Industrial Economics Division, and, at Currie's suggestion, named Richard V. Gilbert as its chief. Gilbert was one of the seven Harvard-Tufts authors of *An Economic Program for Democracy*, a Keynesian analysis and prescription which was widely read in Washington. Among the economists of Keynesian persuasion brought into that division was V Lewis Bassie, who had been one of Currie's assistants at the Federal Reserve from mid-1937.

The Industrial Economics Division had a heavy current policy orientation. The division was in the forefront in applying Keynesian techniques to the analysis of the required magnitudes of public works expenditures, estimates of full employment capacity, and several other areas.⁴² One of these policy memoranda, submitted in October, 1939, evaluated the impact of the European war on the American business situation. The text evidences the work Bassie was doing in extending the estimation of expenditure components in terms of monthly data, and the beginnings of a formalized short-term forecasting technique which utilized these estimates.⁴³

By late 1940 most of the division's staff had moved to defense agencies. In December at the National Defense Advisory Commission, Bassie prepared a memorandum on the "Effects of the Defense Program on the Economy."⁴⁴ The estimates of gross national product it contained were derived by adding direct estimates of consumption and investment, computed independently. A contemporary credits these estimates with being "one of the first attempts to estimate total output by directly adding up the total flow of goods."⁴⁵ Retrospectively, Bassie considers this report "the first to present gross national product data compiled entirely from the product side."⁴⁶

⁴¹*Ibid.*, p. 4018.

⁴²The work of this division is treated more fully in Stein, *The Fiscal Revolution in America*, p. 168, and Byrd L. Jones, "The Role of Keynesians in Wartime Policy and Postwar Planning, 1940–1946," *American Economic Review*, LXII (May, 1972), 125–28.

⁴³U.S., Department of Commerce, Industrial Economics Division, "The Impact of the European War on the American Business Situation," October 16, 1939. (Mimeographed.)

⁴⁴National Archives, War Production Board, Policy Documentation File, Log No. 3093, No. 210 C. This memorandum was declassified for the writer's use, February 20, 1970.

⁴⁵Marvin Hoffenberg, "Estimates of National Output, Distributed Income, Consumer Spending, Saving, and Capital Formation," *Review of Economic Statistics*, XXV (May, 1943), 168, footnote to Table XVIII.

⁴⁶Letter from V Lewis Bassie, January 23, 1970.

This memorandum traced the effects of defense expenditures on (1) plant and equipment expansion required for defense production, (2) expansion of consumer outlays and residential construction resulting from a higher level of income, and (3) the private plant and equipment expansion required for the increases under items (1) and (2). To do this, defense expenditures, net exports, and change in inventories were considered the possible initiating factors that bring about changes in total gross national product. Changes in consumption and private capital formation were related to changes in the total.

The series for gross national product and components for 1926–39 were the data base for the function relationships derived. The gross national product series was composed of consumption (services and goods, durable and nondurable) and investment (producers' plant and equipment, residential construction, government investment, change in inventories, and net exports). Total consumption and total goods consumption were based on Kuznets' series for 1926–28,⁴⁷ and thereafter on an index Bassie prepared using information on retail sales by department stores, chain and independent grocery stores, automobile dealers, and other retail outlets.⁴⁸ Total consumption less goods gave services; total goods less durable goods, as estimated by George Terborgh, gave nondurable goods. Producers' plant and equipment, residential construction, and government investment were also prepared by Terborgh. Change in inventories data were based on an index prepared by Bassie on the basis of relative changes in production and consumption. Net exports were estimated by the Department of Commerce.⁴⁹

This memorandum is also notable as an early example of explicit projections of gross national product and components. Quarterly, seasonally adjusted estimates were prepared for 1939 and fiscal 1940, and from that base, using the three steps described above, two models—one with no restrictions on demand and one with restrictions on civilian demand—were projected through fiscal 1942. This method of forecasting was named the investment factor method, and about a year later was described publicly by two of the others who had been working with Bassie on it in the Industrial Economics Division and had used it subsequently in the Office of Price Administration (OPA).⁵⁰

In summary, by a not altogether direct route, Currie's interest in specific components of national expenditure blossomed into a full set of directly estimated gross national product components. These estimates were the statistical framework for appraisals of the economic situation which were circulated to high government policymakers and were being built into forecasting techniques with avowedly Keynesian inspiration.

⁴⁷Bassie, "Effects of the Defense Program on the Economy," Table A-2.

⁴⁸Letter from V Lewis Bassie, dated January 23, 1970, referring to a memorandum titled "Production, Consumption and Inventories." Revised indexes were prepared by Bassie and released from the War Production Board, March, 1942, p. 1. (Mimeographed.)

⁴⁹Bassie, "Effects of the Defense Program on the Economy," Tables A-2 and A-3.

⁵⁰Richard V. Gilbert and Victor Perlo, "The Investment Factor Method of Forecasting Business Activity," *Econometrica*, X (July–October, 1942), 311–16.

Development of the Official Product Estimates

In mid-1940, Nathan, who had directed the national income work for the previous four years, left what was by then the National Income Division. The concepts and procedures in use at that time by and large were those initially established in preparing *National Income, 1929–32*. Shortly prior to his departure, the National Income Division, with the cooperation of the National Bureau of Economic Research, had assumed responsibility for the estimates of capital formation and consumption that Kuznets had developed. A revision of these estimates back to 1929, continuation of current figures, and estimation of a consumer services component to provide a picture of the entire national income in terms of commodities and services were planned. William H. Shaw, who had assisted Kuznets in preparing *Commodity Flow and Capital Formation*, was placed in charge of the “final product analysis” group.⁵¹

Milton Gilbert was appointed the new chief of the National Income Division in 1941. For two years prior to that he had been editor of the *Survey of Current Business*. His experience in that position influenced what he set out to do.⁵² Each year he wrote an economic review of the year just passed. As he prepared to write, he would have before him the 2,000-odd current series carried in the *Survey*, and the current national income figures, that is, the monthly income payments by distributive shares. The article reviewing the year 1939 illustrates Gilbert’s problem. He wrote:

During the first half of 1939 the economic machine was operating on a relatively even keel, allowing for the usual seasonal movements. Of course, there were changes . . . but by and large they acted as offsetting influences. Construction activity, for example, was expanding, while industrial production showed some recession. Consumption was increasing slightly with the easing of prices; inventories were on a gentle down-grade. But with private capital investment not increasing and with the Government program operating at a steady pace, with inventories at best a neutral factor and with no significantly added stimulus from abroad, the situation lacked any dynamic quality. This can be seen in the movement of the income payments from January to July . . . During that period the fluctuations in this index were very slight.⁵³

The salient point is that although expenditure components were discussed, the supporting data were drawn from several sources. For example, retail sales reported by the Commerce Department, and auto and department store sales reported by the Board of Governors of the Federal Reserve System provided the basis for evaluating consumption. Dun and Bradstreet estimates were used to follow inventory movements. Consequently, the data did not provide complete or consistent coverage, and certainly were not susceptible to being added up to give a total picture. There was no framework into which the various series could be put. National income estimates “reflected” what had happened; they did not explain.

⁵¹“The Government Takes over Current Estimates of Consumer Installment Credit and Capital Formation,” *Bulletin* of the National Bureau of Economic Research, No. 80 (September 9, 1939), 15.

⁵²Milton Gilbert, Interview in Washington, D.C., October, 1969.

⁵³“An Economic Review of 1939,” *Survey of Current Business*, XX (February, 1940), 5.

Further, Gilbert was aware of the work others were doing on problems similar to his own. He was in particularly close contact with his cousin, Richard V. Gilbert. The latter Gilbert, as mentioned earlier, for several years had been preparing and using estimates of expenditure components, income–expenditure relationships, and formalized forecasting techniques. His wartime post as director of research at OPA encouraged an over-all perspective of which estimates and approaches might prove most useful, and it is probable that he influenced the direction of his cousin’s efforts.

With that background, Gilbert recalls that when he became chief of the National Income Division he sought to work out a national income system that would explain the current business situation in Keynesian terms. He sought to bring demand components into national income estimating. When he embarked on the problem, he knew what he wanted to do; he did not know exactly how it would be done.⁵⁴

Gilbert brought into the Division half a dozen new professionals who, by mid-1941, for the most part were at work on two major objectives: strengthening the various ongoing income estimates, and developing the product estimates. Daniel Creamer supervised the work on the first objective. His experience with data from the Social Security Board facilitated more systematic use of that data. Charles F. Schwartz worked on refining state income estimates. The major thrust, however, was to develop the product estimates, for which Shaw had been concentrating on the flow of consumers’ commodities and the gross flow of producers’ durable goods. Gilbert assigned people to the other pieces of the product components. Edward F. Denison worked on services, Wendall A. Hance on inventories. George Jaszi began to develop the government estimates and also collaborated with Gilbert on the annual income and product review articles.

THE CONCEPT OF GROSS NATIONAL PRODUCT

The war was the immediate impetus of the rapid development of the product, or expenditure, components. The central question was: given government war expenditures, how much of total product will be left for civilian consumption? At first, national income was the aggregate from which war expenditures were subtracted to arrive at what would be left for the civilian economy. Gilbert strongly urged that national income was not the most appropriate aggregate for comparisons with and calculations relating to war expenditures.⁵⁵ He argued that war expenditures are largely purchases of current output of goods and services, measured in terms of market prices. Therefore, the aggregate with which they can legitimately be compared is the aggregate of all final goods and services produced within a given period, valued at market prices. National income, in contrast, measures the net value of current output as the sum of net returns to factors of production. Two major changes would be required to convert national income

⁵⁴Milton Gilbert. Interview in Washington, D.C., October, 1969.

⁵⁵Gilbert’s paper, “Measuring National Income as Affected by the War,” presented at the meeting of the American Statistical Association in December 1941, was published in the *Journal of the American Statistical Association*, XXXVII (June, 1942), 186–98. A similar discussion appeared as “War Expenditures and National Production,” *Survey of Current Business*, XXII (March, 1942), 9–16.

into a measure of the aggregate of goods and services at market prices. First, for a market price valuation, the proceeds of business taxes, that is, taxes paid by or through business as a matter of administration, must be added. Second, it is desirable to consider the gross output of capital goods; the current depreciation and depletion deducted to obtain the net figures of national income must be added back in. The quantity arrived at by making these two changes Gilbert called “gross national product” or “gross national expenditure at market prices.”

The move to an aggregate gross of capital consumption was a previously recognized possibility. Kuznets, for example, had given the same two reasons for estimating gross of capital consumption—the possibility over a short period of time of neglecting capital replacement in order to release resources for other uses and the greater accuracy of estimates that do not require estimation of capital consumption.⁵⁶ The inclusion of business taxes among the items to be added to national income to arrive at gross national product and the related decision to include as final product all government output (most conveniently measured by the total of payments to the factors of production) were significant departures from Kuznets’ prewar concept of gross national product. Gilbert, while acknowledging Kuznets’ pioneering efforts, specifically noted this departure.⁵⁷

The statistical process of arriving at the aggregate Gilbert championed is shown by the items of his table.

National income

Plus: Corporation income, excess profits, and capital stock taxes
 Other business taxes
 Depreciation and depletion charges
 Other charges and reserves
 Inventory revaluations

Equals: Gross national product at market prices

The items of product and purchaser composition of the gross national product—henceforth referred to as GNP—are shown below in condensed form.

Gross national expenditure (or product)

Government expenditures for goods and services
 National defense expenditures (adjusted)
 Federal nondefense
 State and local

Private output for private use

Private gross capital expenditures
 Construction
 Equipment
 Net change in foreign claims
 Net change in inventories

⁵⁶Kuznets, *National Income and Capital Formation, 1919–1935*, p. 3.

⁵⁷From this point on the differences between the Kuznets and Commerce Department viewpoints widened. See Simon Kuznets, “National Income: A New Version,” and Milton Gilbert, *et al.*, “Objective of National Income Measurement: A Reply to Professor Kuznets,” *Review of Economics and Statistics*, XXX (August, 1948), 151–95.

Consumers' purchases
Durable goods
Nondurable goods and services

The two tables that were itemized above can be seen as the predecessors of the two sides of the "National Income and Product Account" in the official Commerce Department summary accounts.⁵⁸ Of course, at this time they were not presented explicitly as the debit and credit sides of a single account. And, to be sure, changes were made in terminology as well as in items included and excluded. But it was from this base of presenting the national aggregates that work was to proceed rather quickly to the elaboration of the sector accounts, and subsequently an accounting framework for the estimates.

ELABORATION: SECTOR ANALYSIS, STATISTICAL RELATIONS, AND SOURCES
AND METHODS

In April, the month following Gilbert's article, the *Survey of Current Business* carried two significant articles. An article by R. B. Bangs presented the first extended series on disposable income of individuals.⁵⁹ The idea of subtracting personal taxes from income payments to individuals had been mentioned earlier, for example, in Cone's *Monthly Income Payments in the United States, 1929-40*, where he stated, "it is obviously desirable to determine that portion of consumer income which actually was or is being devoted to taxes in order to approximate more closely the residual income available for the purchase of commodities currently coming into the market."⁶⁰ At that time it was not considered statistically feasible to make the tax adjustment.

As the war program grew in size, restriction of civilian production became necessary at the same time as the income of individuals continued to grow. Thus the purpose of Bangs' article was to consider the relation of income and consumption as "a measure of the effect of war on the broad income and expenditure pattern of consumers and for the light that may thus be thrown upon the problem of the size of the inflationary gap." A simple Keynesian consumption function was discussed: consumer expenditures were plotted against disposable income in a scatter diagram with a least squares regression line fitted to annual data for 1929-40. For the war period, monthly data at seasonally adjusted annual rates were plotted. The above-trend saving for 1941 was noted and the factors responsible—increased scarcity of consumer goods, the build up of tax reserves, the defense savings campaign, resistance to rising prices, and uncertainty of income levels in the future—were discussed. The implications for the degree of inflationary pressure in the following year were drawn.

The series Bangs used—personal taxes (which were not published but were derivable), consumption expenditures, and personal saving—make up the debit

⁵⁸A set of five summary accounts is now prepared by the Bureau of Economic Analysis. See the July issues of the *Survey of Current Business*, for example, *Survey of Current Business*, LIII (July, 1973), 16-17.

⁵⁹R. B. Bangs, "The Changing Relation of Consumer Income and Expenditure," *Survey of Current Business*, XXII (April, 1942), 8-12.

⁶⁰Frederick M. Cone, *Monthly Income Payments in the United States, 1929-40* (Washington, D. C., 1940), p. 16.

side of what became the personal income and outlay account. The credit side, showing the distribution of income payments by type, had been available since the income payments series was developed in 1938.

Also in April, Shaw presented the estimates of the largest segments of the final products study.⁶¹ Estimates of finished commodities and new construction were released “separately and in advance of the complete study at the request of several war agencies which require the data for the wide variety of decisions in economic matters that must be made from day to day.”⁶² The basic commodity flow estimating procedure was described briefly. Although this description was admittedly brief, considering how new this approach was to many persons and how the pressures of war work delayed description in full, it was important that even this much procedural detail was available.

The GNP series was effectively launched in May, 1942: estimates extending from 1929, tables showing the interrelationships among the segments, and a few notes on the sources and methods of estimates were provided.⁶³ The article emphasized that the data were offered as an analytical tool rather than as precise measurements. Several of the component series were still some distance from their finished form, and it was hoped that several series—savings of individuals, consumer expenditures, and corporate savings—would soon be estimated by direct measurement rather than as residuals.

Four interesting tables were included in the article. The table “Relation of Gross National Product to National Income” at this point of time indicated not only the conceptual relation between the two series, but also the method of calculating GNP pending completion of the final products study. It was emphasized that although normally the year-to-year movements in the two aggregates are not much different, when national income is changing sharply (as 1941), or at business cycle turning points (as 1933), any divergence between the two series is analytically significant. Two tables presented breakdowns of GNP by use of product and by use of funds. The first distinguished broadly the uses made—by government, and by the private sector for capital formation and consumption; the second detailed the disposition of the gross income flows generated by current production. Another table showed the disposition of income received by individuals among taxes, saving, and consumption.

In describing these tables the article noted: “Each of these breakdowns is useful for particular purposes; together they yield a rounded picture of the commodity and financial flows which jointly determine the structure of the national product.”⁶⁴ This was an initial appearance of the theme that income and product estimates, in their various breakdowns, provided a “bird’s eye view” of the functioning of the economy. This theme was significant to the Commerce Department method of structuring the accounts. It represents the moving away

⁶¹William H. Shaw, “The Gross Flow of Finished Commodities and New Construction, 1929–41,” *Survey of Current Business*, XXII (April, 1942), 13–20.

⁶²*Ibid.*, p. 13.

⁶³Milton Gilbert and R. B. Bangs, “Preliminary Estimates of Gross National Product, 1929–41,” *Survey of Current Business*, XXII (May, 1942), 9–13.

⁶⁴*Ibid.*, p. 11.

from the emphasis on the charting of totals toward explanations of the determination of income levels in the framework of national income estimates.

In August, 1942, gross national product and national income were first presented on a quarterly basis.⁶⁵ A cautionary statement was made: "All concerned wish it understood that quarterly estimates so soon after the event are necessarily more approximate than usual annual series." The quarterly figures for the components were interpolations of the annual figures published in May.

Also of interest in this article was a table showing GNP in constant prices. Data for second quarter 1941 and 1942, in second quarter 1941 prices, were shown for government war expenditures, government nonwar expenditures, private gross capital formation, and expenditures for consumers' goods and services. An attempt was made to deflate the series on a disaggregated basis. For example, in the case of private capital formation, several components of construction—residential, commercial and factory, public utility, and farm—and several components of producers' durable equipment were handled separately. This was the most detailed deflation to that date.

In a March, 1943, article on income and product, the tables and notes consolidated the material appearing earlier, included revised estimates for several series, and presented new statistical material.⁶⁶ Of the new statistical material, two tables are of special interest in tracing the emergence of the accounting scheme eventually developed. First, "Absorption of Gross Savings by Federal Government, 1939–42" contained the elements that would eventually be incorporated in the Gross Saving and Investment Account. The orientation, as indicated by the title, was different, but the components were there. In this presentation, components were summed to gross private savings, and gross private capital formation was subtracted to yield gross private savings available to government. To the latter was added state and local government budget surplus and social insurance savings, to yield total gross savings available to Federal government. It would be a simple matter, at least statistically, to arrange private gross capital formation (which included net exports) on one side on an account, and all sources of savings, public and private, to the other.

The derivation of the government expenditure and government receipt series from published statistics on government finance was also shown. The balancing items necessary to the construction of explicit accounts, that is, the surplus or deficits of the Federal government and state and local governments, had been presented in the table on absorption of gross savings.

Thus, within about two years, the national income and product estimates were restructured; the important elements of the system that survive today had been derived. In summary, Jaszi recalls the events in this way. During the war, in addition to the available measurement of output in terms of income flows, a measurement in terms of product flows was needed for economic analysis and policy formation. "This measurement was provided in the form of the gross national product; and GNP, national income, and some other pre-existing pieces

⁶⁵Milton Gilbert and Robert Bangs, "National Income and The War Effort—First Half of 1942," *Survey of Current Business*, XXII (August, 1942), 10–17.

⁶⁶Milton Gilbert and George Jaszi, "National Income and Product in 1942," *Survey of Current Business*, XXIII (March, 1943), 10–26.

quickly jelled into a coherent system of accounts. This was a thrilling process, which to a large extent took place without advance planning on the part of the main architects."⁶⁷

USES OF NATIONAL INCOME ESTIMATES DURING WORLD WAR II

Testimonials to the usefulness of national income estimates in the mobilization for World War II are abundant. For example, Wesley C. Mitchell commented that only those who had a personal share in the economic mobilization for World War I could realize in how many ways and how much estimates of national income covering twenty years and classified in several ways facilitated the World War II effort.⁶⁸ The following sections illustrate how the national income framework was utilized in two policy areas in which it was of particular advantage: anti-inflationary policy, and over-all resource programming. Inflation analysis builds upon the emerging sector accounts and resource programming upon GNP, both of which were significant new elements of the national income framework.

*Resource Programming: The Victory Program and the Feasibility Dispute*⁶⁹

By mid-1941 the Supply, Priorities, and Allocation Board (SPAB) had been charged with determining requirements for materials and commodities needed for defense, civilian, and other purposes, and establishing policies to fulfill such requirements. SPAB compiled the requirements submitted by the war agencies into a Victory Program, aggregating expenditures of about \$150 billion by September, 1943. The requirements were enormous by any previous standard. The next question was: Is the Victory Program feasible? The first analysis for feasibility was completed in December, 1941, by Robert R. Nathan, formerly of the National Income Division. Nathan depended primarily on national income analysis to conclude that three-fourths of the Victory Program could be achieved by September, 1943, and all of it by Spring, 1944.⁷⁰

In a message to Congress in January, 1942, following the declarations of war, President Roosevelt announced new all-out goals. Even for the optimists, these goals stretched the limits of the nation's economic potential. Further, shortly thereafter the armed services began adding on to their lists of requirements.

The War Production Board (WPB) was formed that same month and the agency's Planning Committee, chaired by Nathan, was assigned the task of ascertaining whether the announced munitions program could be achieved on schedule. Simon Kuznets was detailed from another division of the WPB to

⁶⁷George Jaszi, "The Quarterly National Income and Product Accounts of the United States, 1942-62," in *Income and Wealth*, Series XI, ed. by Simon Goldberg and Phyllis Deane (London, 1966), p. 102.

⁶⁸Wesley C. Mitchell, *The National Bureau's First Quarter Century*, the Twenty-fifth Annual Report (New York, 1945), p. 18.

⁶⁹For background information on the section below, the major source has been Committee on Public Administration Cases, *The Feasibility Dispute: Determination of War Production Objectives for 1942 and 1943*, by John Brigande (Washington, D.C., 1950).

⁷⁰National Archives, War Production Board, Policy Documentation File, No. 214, memorandum to Donald M. Nelson from Stacy May, dated December 4, 1941.

consider the implications for the economy as a whole, and by March his preliminary analysis showed that the goals currently proposed could not be met within the time periods set. A full-scale feasibility study was begun in early May. This four-month study was divided into four parts, presenting analyses in terms of dollar valuation, raw materials, industrial equipment, and labor supply.⁷¹ In the dollar valuation part, the first step was to quantify the military production objectives. A total of \$55 billion for 1942 and \$87 billion for 1943 was estimated. Thereafter Kuznets considered whether this military production program was feasible. To begin with, Kuznets marshalled quarterly estimates of GNP at seasonally adjusted annual rates for 1939 through the second quarter of 1942; these were the Department of Commerce estimates. He projected GNP (in constant prices) on the basis of two alternative assumptions. Considering his estimates for the military production objectives (after certain conceptual and price adjustments) the first charge upon GNP, he analysed the implication for the nonwar residual. Even assuming drastic reduction in private capital formation and government nonwar expenditures, the residual for consumers' expenditures was much below realizable levels. He also tried the alternative assumption that consumers' expenditures would decline at a percentage annual rate equal to the drop between the first and second quarter of 1942. Kuznets concluded, even on his favorable GNP assumptions, that there would be a failure to reach annual objectives of almost 12 percent of the total. The analysis for 1943 showed a similar shortfall, even without consideration of the unfulfilled residue of 1942 goals.

The Inflationary Gap Analysis

In economics, as in ladies' fashions, the war has created a new vogue—the "inflationary gap." Its measurement is the latest and perhaps one of the most popular of the increasing applications of statistics to questions of national economic policy.⁷²

Estimates of these gaps, essentially comparisons of estimates of potential real output of goods and services with estimated demand, assuming levels of defense expenditure, were made in various forms. Total income gaps and consumer income gaps were most common. Various governmental agencies including the Office of Price Administration, the Treasury, the National Resources Planning Board, and the Bureau of Foreign and Domestic Commerce, worked up their own estimates.⁷³

Presentations by the Treasury Department illustrate the use of national income estimates in calculating an inflationary gap and in drawing up a policy stance based on the calculations. The inflationary gap analysis was most often used

⁷¹U.S., War Production Board, Planning Committee Document No. 151, a memorandum to the Planning Committee from Simon Kuznets on "Analysis of the Production Program," dated August 12, 1942.

⁷²Walter S. Salant, "The Inflationary Gap: I. Meaning and Significance for Policy Making," *American Economic Review*, XXXII (June, 1942), 308.

⁷³As examples, see Salant, "The Inflationary Gap," pp. 310–11, for a description of the OPA method; U.S., National Resources Planning Board, Trends and Stabilization Section, *Trends, 3rd Quarter, 1942*, pp. I-4 to I-7; Bangs, "The Changing Relation of Consumer Income and Expenditure," especially p. 12.

in connection with tax policy, specifically in calculating tax changes required to prevent inflation. Although by no means the first inflationary gap calculated, in Congressional hearings in March, 1942, Secretary Henry Morgenthau, Jr., proposed speeding up collection of 1942 taxes. His discussion included a very rough calculation.

I have been pointing out the so-called gap between the amount of money in the pockets of people with which they can purchase and the amount of civilian goods they can buy. . . . Now this gap has been estimated anywhere between eleven and fifteen billion dollars, and this tax program . . . is designed to do as much as we think is practicable to do now with taxes.⁷⁴

The Treasury's Director of Research and Statistics outlined the calculations necessary: with national income estimated at \$115 billion, civilian purchasing power would be \$78 billion or more, yet only \$68 billion worth of civilian goods would be available.

Eighteen months later the Treasury again made a presentation before the Ways and Means Committee. At this time a full-blown, sophisticated statement prepared by the Division of Tax Research presented the inflationary gap analysis.

The calculation runs roughly as follows: For calendar 1944, income payments are estimated at about \$157,000,000,000, and personal taxes . . . at about \$22,000,000,000, leaving "disposable income" of about \$135,000,000,000. It is generous to figure consumer supplies, at present prices, at \$88,000,000,000. Thus the amount that consumers will need in order to buy the available goods, and to pay the personal taxes imposed under present laws, will fall short of their total income by \$47,000,000,000.

Besides spending and paying personal taxes, of course, citizens have needs for saving. . . . An outside figure for the amount needed to carry out contracts for debt repayments, life insurance and so on is $7\frac{1}{2}$ billion dollars. . . . In view of post-war uncertainties, many people feel a need for savings going beyond these commitments. But the total savings need may be written up to three times the $7\frac{1}{2}$ billion dollar figure—which also means to three times the savings level of 1940 without making it possible to estimate the excess of incomes over all requirements at less than \$25,000,000,000.⁷⁵

Thus, it was concluded that \$25,000,000,000 was the amount that could be supported in properly designed additional taxes.

In this latter presentation the aggregates are more specifically delineated, e.g., income payments; the uses side of the personal sector account comes through clearly; the discontinuities in the savings function are allowed for. In addition, some consideration was given to the uneven distribution between and within income brackets of this "excess" of incomes. Tables supported this presentation, including a complete section on the relation between government expenditures, consumer expenditures, and the several measures of income and output.

⁷⁴U.S., Congress, House, Committee on Ways and Means, *Revenue Revisions of 1942, Hearings*, 77th Cong., 2d sess., 1942, p. 48.

⁷⁵U.S., Congress, House, Committee on Ways and Means, *Revenue Revisions of 1943, Hearings*, 78th Cong., 1st sess., 1943, p. 29.

In retrospect, the development of a more detailed and integrated statistical picture of the economy was a causal factor in the great progress in the analysis of inflationary pressure. First, the national income and product framework provided a realistic basis for appraising simultaneously both the supplies of goods which would be forthcoming, and the pressure of demand which could be expected in corresponding markets. Second, national income and product statements indicated necessary relationships between totals of various items of data on production, income, and allocation of income. These provided not only measures of the *ex ante* inflationary gap but also the framework within which—via price increases, induced saving, or whatever—the gaps must be reduced to zero.⁷⁶

To repeat, the instances cited above of the use of national income estimates in calculating the nation's economic potential and the inflationary gap are but illustrative. All over Washington economists and statisticians were working on related problems. Under the urgent conditions of the time, new approaches were tolerated. The estimates were sometimes crude, the techniques forged were imperfect, and final policy action was not always clearly related to the economic analysis. However, from the point of view of the history of the national income estimates the important fact is that the estimates achieved new recognition. By the end of the war, income and product estimates had emerged as an essential tool in the formation of economic policy.

POSTWAR CONSOLIDATION: THE 1947 NATIONAL INCOME SUPPLEMENT

In July, 1947, a basic revision of the estimates of national income and product and their component series was published by the Office of Business Economics (OBE), the agency by then responsible for the estimates. This revision was supervised by Gilbert. Denison, Jaszi, and Schwartz were in charge of major portions. The revision was designed to carry out three objectives: "(1) to complete the setting up of the whole body of national income statistics as an interrelated and consistent system of national economic accounting, (2) to improve the statistical procedures. . . and to base them on the latest source data, and (3) to incorporate a number of changes in the basic aggregates so as to achieve more generally useful and clear-cut definitions of national income and product."⁷⁷ Although the statistical improvement in the series was important, including such major efforts as direct estimation of personal consumption expenditure, more interesting to the history of the national income estimates were the introduction of the economic accounting framework and changes in the basic aggregates. The latter two will be discussed below.

At this point it should be mentioned that similar objectives were being pursued by experts in other countries as well. In Great Britain estimates of national income and expenditure arranged in two-sided tables had been published

⁷⁶John E. Lintner, "The Theory of Money and Prices," in *The New Economics*, ed. by Seymour E. Harris (New York, 1947), pp. 508-509.

⁷⁷U.S., Department of Commerce, Bureau of Foreign and Domestic Commerce, Office of Business Economics, *National Income and Product Statistics of the United States, 1929-46*, a supplement to the *Survey of Current Business* (Washington, D.C., 1947), p. 1. Hereinafter referred to as *National Income, 1947 Edition*.

with the 1941 Budget.⁷⁸ Subsequent White Papers on National Income expanded the estimates, so that by 1947 an integrated, almost completely articulated system of current and capital accounts had evolved. In 1944 consultations between national income experts in the United States, Great Britain, and Canada were formalized, the object of which was to compare conceptual and statistical treatments.⁷⁹ At the end of 1945 the League of Nations convened a group to consider national income statistics; the memorandum prepared by Richard Stone which served as a basis for the group's discussion stands as a landmark in the development of the economic accounting approach.⁸⁰

The Accounting Approach

OBE sought to present the series of national income aggregates believed to be most generally useful, arranged to show the interrelationships of the various magnitudes. The accounting approach, which was introduced to serve this objective, is described by Jaszi as embodying the following points: (1) division of the economy into groups of transactors and the depiction of the economic process in terms of their transactions, (2) organization around the concept of production, (3) distinction between current and capital transactions, and (4) emphasis on the fact that in some sense incomings and outgoings of each transactor must be equal.⁸¹ Denison recorded that the preparation of the system of accounts was not a sudden innovation, but rather a "refinement and formalization of the sorts of tables found most useful in economic analysis and developed experimentally. . . in the past few years."⁸²

From early in this developmental period Jaszi had stressed the interrelationships of transactions and transactors which could be brought to light by an appropriately constructed framework. He worked out one possible framework in the form of a table of accounts. He recalls starting from the national income and product totals, setting out the business transactions (receipts from sale of goods and services, on one hand, and wages and other payments, on the other), and finally setting down the various receipts and payments for other sectors. An early version of this table of accounts had appeared in a 1944 article by Gilbert and Jaszi. That table showed columns for each of the government, business, and individual sectors; each column showed receipts and disposal of receipts. Capital accounts were shown "below the line" in a second panel of each column. The

⁷⁸Great Britain, Financial Secretary to the Treasury, *An Analysis of the Sources of War Finance and an Estimate of the National Income and Expenditure in 1938 and 1940*, Cmd. 6261 (London, 1941).

⁷⁹Edward F. Denison, "Report on Tripartite Discussions of National Income Measurement," in Conference on Research in Income and Wealth, *Studies in Income and Wealth*, Vol. X (New York, 1947).

⁸⁰Richard Stone, "Definition and Measurement of the National Income and Related Totals," in League of Nations Committee of Statistical Experts, *Measurement of National Income and the Construction of Social Accounts*, Report of the Sub-committee on National Income Statistics (Geneva, 1947).

⁸¹George Jaszi, "The Conceptual Basis of the Accounts," in Conference on Research in Income and Wealth, *A Critique of the United States Income and Product Accounts*, Studies in Income and Wealth, Vol. XXII (Princeton, 1958), pp. 21-22.

⁸²Denison, "Report on Tripartite Discussions of National Income Measurement," p. 7.

familiar income and product aggregates did not appear in the table, but could be derived.⁸³

Within OBE discussion continued about the form of presentation. Gilbert wanted to make the total for each account represent a significant economic aggregate. Jaszi, who preferred to de-emphasize the importance of individual aggregates, did not think that this was possible. Gilbert remembers that the discussion was a standoff until it occurred to him to set forth a separate saving and investment account as a repository of the counter-entries for capital items. In that way it would be possible to develop current sector accounts that summed to significant aggregates, show that saving equaled investment, and eliminate the “below the line” panels.⁸⁴

As OBE presented it in 1947, this accounting, or “bird’s-eye-view of the economy,” approach was a set of T-accounts, six in number, drawn up for the year 1939. A summary “National Income and Product Account” showed, on the left, the income items summed to charges against GNP and, on the right, the expenditure items summed to GNP. This summary account has changed very little in structure since 1947. Sector accounts were provided for business, government, persons (seen as the consuming public), and the rest of the world. A consolidated gross saving and investment account for the economy as a whole showed changes in assets, liabilities, and surplus arising out of the current production and current income flow in the accounting period.⁸⁵

In this system, every item appeared twice in the accounts—once as a debit in the account making payment, and once as a credit in the account receiving payment. For example, national income could be obtained by adding either factor income paid out (or retained) by the sectors or factor income received (or retained). Thus the transactions and their relationships in the total were spelled out.

Definition of the Aggregates

National Income, 1947 Edition defined five major aggregates: national income, gross national product or expenditure, net national product or expenditure, personal income, and disposable income. A comparison with current practice shows that the same five aggregates have been retained as the featured series, and, as well, the definitions of the aggregates have remained virtually unchanged.⁸⁶ Of course, reference to the definitions of the components shows that

⁸³Milton Gilbert and George Jaszi, “National Product and Income Statistics as an Aid in Economic Problems,” *Dun’s Review*, LII (February, 1944), 11. The article was reprinted in *Readings in the Theory of Income Distribution*, selected by William Fellner and Bernard F. Haley (Homewood, Ill., 1951).

⁸⁴Milton Gilbert. Interview in Washington, D.C., October, 1969.

⁸⁵In 1958 the business sector account was eliminated, and a five-account structure has been used since that time.

⁸⁶The exception to a statement that the changes in the wording have been purely in style and punctuation is the conceptual change involved in substituting “net exports (exports less imports)” for “net foreign investment,” as a component of GNP. For current definitions see U.S., Department of Commerce, Office of Business Economics, *The National Income and Product Accounts of the United States, 1929–1965: Statistical Tables*, a supplement to the *Survey of Current Business* (Washington, D.C., 1966), p. viii.

changes have been made in these series. Yet it may be noted that the essential framework set forth in 1947 remains intact.

In large part the 1947 presentation ended the debate in the United States over terminology of the major series. Some economists, particularly the British, would have preferred to use “national income,” modified respectively by “at factor cost” or “at market prices” to designate what OBE called “national income” and “net national product.” OBE preferred the terms cited because it was believed that nontechnicians could better visualize national income as the sum of factor shares and national product as the sum of goods and services. Also, the series that had been called “national income payments to individuals” was changed to “personal income” to reflect that the series included items to which no cash payments correspond. It was acknowledged, however, that this title did not adequately reflect that income of nonprofit institutions was included as well.

Although OBE’s general approach was to play down aggregates, it was reiterated during these years that essentially the GNP was designed to measure total production. The history of the concept shows that it was forged so that war production could be compared with it, and so that the amount of total production that would be left for civilian consumption could be calculated as a residual. Gilbert wrote quite emphatically: “I can only repeat that we are not trying to measure welfare, but the value of production from a business point of view.”⁸⁷

The changes made in the treatment of the aggregates involved decisions to include or exclude specific items and in methods of calculation. Among the significant ones were the exclusion of interest on government debt from income and product measures; inclusion of corporate profits tax in the profits measure; inclusion of an inventory valuation adjustment in national income; and inclusion of several imputations—the major ones being for owner-occupied homes and interest of financial intermediaries—in the aggregates. Some of these changes stirred little interest; some are still controversial today.

This brings the history of the national income and product estimates within the memory of many of the users of the estimates. Thereafter the main lines of their development are more familiar, encompassing both refinement and elaboration of the estimates and proliferation of uses.

A major characteristic of the extensive refinement and elaboration was that they took place within the context of an integrated system of economic accounts. With regard to the income and product accounts themselves, the significant efforts were to develop greater detail in the published series, improve estimating techniques, provide constant-dollar versions of the major series, produce estimates more quickly and more of the estimates on a quarterly schedule, and write up the conceptual and statistical framework of the estimates. As evidenced by the report of the National Accounts Review Committee, by the mid-1950’s a movement was underway to integrate the hitherto largely independent segments of economic accounts—national income and product, balance of payments, flow of funds, input–output, and balance sheets and wealth statements—into a single national economic accounting system. The income and product accounts form a cornerstone. The balance of payments statements were fully integrated with them

⁸⁷Milton Gilbert, “National Income: Concepts and Measurements,” in *Measuring and Projecting National Income*, Studies in Business Policy, No. 5 (New York, 1945), p. 5.

by 1965; flow of funds accounts use national income estimates for their current nonfinancial items; input-output tables integrated with the income and product estimates were published beginning in 1964; the Bureau of Economic Analysis, which now produces the national income estimates, has been assigned focal responsibility for a comprehensive tangible wealth statement. Most recently ways are being sought to evaluate environmental impact and other social concerns within an income and product framework.

The proliferation of uses of the estimates was both in terms of number of users and types of uses. Economic policy formulation has relied heavily on them. From their beginning the Economic Reports prepared by the Council of Economic Advisers placed national income and product estimates in the postwar spotlight. Thereafter the Council and the Joint Economic Committee, among others, actively sought more detail and greater speed in preparing the estimates so that they would be of greater use to the policy makers. Businesses increasingly used these data to develop forecasts of the economy, which were in turn used for market research, investment planning, and financial appraisals, among other things. In the academic world, national income and product estimates were brought within the expounded body of economics; today it would be difficult for a university student to imagine what macro-economics would be like without a national income and product framework.