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OFF TO A GOOD START:
THE NBER AND THE MEASUREMENT OF NATIONAL INCOME

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Many thanks are due to Katharine Abraham who discussed a previous draft when it was presented at the 2020 annual meeting of the American Economic Association in a session celebrating the 100th anniversary of the Bureau, and to Claudia Goldin for many helpful comments. The remaining errors are mine. The views expressed herein are those of the author and do not necessarily reflect the views of the National Bureau of Economic Research.

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Off to a Good Start: The NBER and the Measurement of National Income
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ABSTRACT

The creation of the National Bureau of Economic Research was a response to the bitter controversies over the distribution of income that roiled the United States during the Progressive Era. Thanks to Malcolm Rorty, a business economist, and Nahum I. Stone, an independent socialist economist, a “Committee on the Distribution of Income” was created; what might be considered the first name of the Bureau. Funding was secured, the Bureau was chartered in 1920, and Wesley Mitchell was appointed the director of research. The Bureau’s first publication, *Income in the United States, its Amount and Distribution* was widely hailed as a major contribution. Further estimates of national income and its distribution for the 1920s were made by Willford King and Lillian Epstein. The Great Depression led to legislation requiring federal government estimates. Simon Kuznets was seconded from the Bureau to the Commerce Department where he led the team that produced the first federal estimates and established the unit for producing updates. The early investigators at the Bureau proved to be masters of combining sources of data to produce credible estimates. The result was estimates that still underlie our understanding of the growth and fluctuations of the American Economy.

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1. A Time like our Own¹

The official birthday of the National Bureau of Economic Research falls in January 1920. The push to start the Bureau had begun several years earlier but the final creation was delayed by World War I. It was a time very much like our own. The economy had righted itself after the devastating financial panic of 1907 when unemployment as a share of the civilian private nonfarm labor force soared to 11.8% (*Historical Statistics, Millennial Edition*, series Ba476). But then unemployment had jumped again to 13.4% after the financial crisis produced by the outbreak of World War I.

Inevitably, the business cycle was on the public mind when an application for funding for the Bureau was made to the Rockefeller foundation. It was, moreover, a period in which controversy over the distribution of income had risen to a fever pitch. Progressives blamed the growth of Big Business for an increase in inequality. Robber Barons such as oil man John D. Rockefeller and steel man Andrew Carnegie, Progressives claimed, were stealing the fruits of the second industrial revolution. Many people also blamed a wave of immigrants from Eastern and Southern Europe for depressing wages.

In 1915 two books on the distribution of the national income were published that would lead directly to the formation of the Bureau.² First, Macmillan published *Income, an Examination of the Returns for Services*

¹ Many thanks are due to Katharine Abraham who discussed a previous draft when it was presented at the 2020 annual meeting of the American Economic Association in a session celebrating the 100th anniversary of the Bureau, and to Claudia Goldin for many helpful comments. The remaining errors are mine.

² Here I will be using the term national income as a generic to cover all measures of the size of the economy such as gross national product, gross domestic product, net national product, and so on, except as shown in the tables. In the National Income and Product Accounts national income is defined as net national product less the statistical discrepancy.

Rendered and from Property Owned in the United States by Scott Nearing, a passionate socialist. After examining wages, dividends, interest, and so on in many different industries, Nearing concluded that far too much of the national income was going to the owners of property and far too little to those who worked to produce it. Here was the proof that inequality had been rising as a result of the depredations of what came to be called the Robber Barons. The intent was similar to Piketty (2014).

A month after Nearing's book was published Macmillan brought out a different sort of book on the same subject by Willford I. King: *The Wealth and Income of the People of the United States*. King, unlike Nearing, was part of the economic establishment; a professor of statistics at the University of Wisconsin and a student of Richard T. Ely, a founder and the first Secretary of the American Economic Association. King's book, unlike Nearing's, made use of techniques and presented its findings in ways that would be familiar to economists today. For example, King used and thus drew the profession's attention to the Lorenz curve which had been developed a few years earlier by another University of Wisconsin Ph.D., Max O. Lorenz. King also attempted to put his estimates of the returns to factors of production and the distribution of wealth and income into historical and international perspective. King found that the share of income going to labor (Nearing's focus) had declined in the two decades before 1910, King suggested that the probable causes of the decline of labor's share were the decline in the amount of free land and "the great influx from abroad of labor of a low degree of efficiency" (King 1915, 163). King also found that real wages had fallen between 1900 and 1910.³

³ Recent estimates, however, show an increase in the real wages of unskilled labor and of production workers between 1900 and 1910 (www.mearuingworth.com).

King (1915, 231) found, moreover, that there had been a “marked concentration of income in the hands of the very rich” between 1896 and 1910. To explain it he engaged in some rabble-rousing that Nearing would have approved.

“But the greatest force in the last three decades making for income concentration has been the successful organization of monster corporations. The promoters and manipulators of these concerns have received, as their share of the spoils, permanent income claims, in the shape of securities, large enough to make Croesus appear like a pauper” (King 1915, 218).

As with Nearing the parallel between King (2015) and Piketty (2014) is clear.

King’s book was well received by economists, but Nearing’s was not. One of the critical reviews of Nearing’s book, surprisingly, was by Nahum I. Stone in the *Intercollegiate Socialist* (1916). Stone approved of Nearing’s politics, and of his attempt to measure labor’s share of national income, but thought that Nearing’s statistics missed the mark. Stone showed that Nearing had omitted several important sources of service income such as work done by agricultural laborers. Whereas Nearing put labor’s share at near 50% of national income, Stone put it at nearer 70%.

Stone thought that getting this number right was important, but that the real gains to labor would not come from attempting to make this number higher by confiscating and redistributing property income because a large share of property income was invested, and this was important for the maintenance and continued growth of the economy. Simon Kuznets (1950), incidentally, would later analyze savings by income class in detail. The real gains from socialism, Stone thought, would come from eliminating

wasteful competition: traveling salesman, multiple stores selling the same things in the same neighborhood, and so on.

Malcolm Rorty, a conservative business economist who had met Stone read this review and was impressed by Stone's commitment to the facts. Here was a socialist he could work with. He invited Stone to lunch, and together they proposed what became the National Bureau of Economic Research.

2. The Committee on the Distribution of Income⁴

Rorty and Stone agreed that an organization that produced accurate, nonpartisan, statistics would advance public discussion of inequality and other issues. To be sure, the idea for such an organization was in the air. The short-lived Bureau of Economic Research was started in 1899, directed by John R. Commons and financed by George H. Shibley, a wealthy New York lawyer. Edwin F. Gay, a Harvard professor and the first Dean of the Harvard Business School, had approached the Rockefeller Foundation with a proposal for a research organization. And Irving Fisher (1919) advocated something along these lines in his 1918 Presidential address to the American Economic Association.

It was also a time of ferment in economics. What would eventually be known as the Institutional School was challenging the neoclassical mainstream. The institutional school emphasized the importance of understanding institutions such as the legal system that shape economic

⁴ This section is based mainly on Fabricant (1984) and Rutherford (2011).

activity. And it emphasized that markets had to be analyzed with empirical data because they did not necessarily conform to simple theoretical models. There is no official list of members of the Institutional School. But Commons is usually identified as an institutional economist as is Wesley Mitchell the first director of the Bureau and many of the early researchers. Indeed, the Bureau can be viewed to some extent as a product of the Institutional Movement.

Rorty proved to be an exceptional organizer and fundraiser. He enlisted a number of top economists to form "The Committee on the Distribution of Income" which held its first meeting in June 1917. Indeed, it could be said that this was the first name of the Bureau. The Committee's charge was to estimate accurately labor's share in national income. Nearing and King had tried, but the Bureau, it was hoped could produce a study of such thoroughness that its conclusions would be accepted across the political spectrum.

Formation of the Bureau was delayed by World War I. Afterwards Rorty was able to line up funding and the Bureau was chartered in 1920. Initial funding was provided by the Commonwealth Fund, but they then shifted to other projects. In 1921 the Carnegie Corporation made a three-year grant (part to be matched by funds from other sources) and beginning in 1923 ten years of support was obtained from the Laura Spellman Rockefeller Memorial (again with requirements that part be matched). Over the course of the 1920s, however, many other sources of funding were tapped. The last grant directly to the Bureau from the Memorial was in 1928 for \$25,000 per year for five years. But in 1928 that amounted to only 15 percent of the Bureau's budget.

3. The Bureau's First Estimates of National Income

Wesley Clair Mitchell was appointed the first director of the Bureau; at once an obvious and inspired choice. He was already well known and admired for the care he had taken in assembling data for his classic studies of the greenback during the Civil War (1903) and of the business cycle (1913). Mitchell assembled a team that included King, Frederick R. Macaulay, and Oswald W. Knauth and set to work on the Bureau's first project: a detailed study of the amount and distribution of the national income. The result, *Income in the United States, Its Amount and Distribution, 1909–1919*, was published in two volumes (Mitchell, et al. 1921). Nearly 600 pages in all, it far surpassed anything that had come before in terms of the amount of data utilized and the care taken in thoroughly double-checking the component estimates.

The study made a clever use of the circular flow. King was tasked with estimating national income from the payments-for-final-products side, and Knauth with estimating it from the payments-for-productive-services side. The two estimates turned out to be reassuringly close, at least in the Bureau's estimation. Here was something that a team employed by a foundation could do, that would be difficult for a professor toiling alone in a library; a clear example of the value of a foundation dedicated to economic research.

Inequality, the issue that had motivated formation of the Bureau, was discussed in the penultimate chapter of the summary volume. This chapter discussed estimates of the distribution of income by factor of production (a la Nearing), estimates of the proportion the population earning less than \$2,000 per year (which is about \$33,000 per year in 2018 dollars inflating

with the consumer price index, Williamson 2019), and estimates by Frederic Macaulay of the personal distribution of income in 1918 based on the newly available income tax returns.⁵ The data revealed substantial inequality: the share of income going to the top 1 percent was 14 percent, and the share going to the top 10 percent was 35 percent. The World Inequality Database (at <https://wid.world/>, accessed in September 2018), put these figures for 1918 at similar levels of 16 percent and 40 percent. The chapter on inequality in that first volume, true to the principles that were adopted from the start and that have been adhered to by the Bureau ever since, does not end with rabble-rousing or policy recommendations. Instead, it ends with a chart and an explanation of a 1918 Lorenz curve.

The reviews were uniformly positive, but not uncritical. Arthur Bowley (1923) writing in the *Quarterly Journal of Economics*, for example, began by declaring that the volumes were a “landmark in the progress of statistical research, and that all future investigators in the field of National Income will take them as their guide and chart.” But he did have some complaints. The main one concerned the treatment of the distribution of income in the summary volume, the subject that he thought would be of most interest to the public. Bowley (1923, 511) thought that the estimates were so uncertain that they should have been excluded altogether or at most buried “in volume ii, under Mr. Macaulay’s mathematics.”

Macaulay and Knauth moved on, but work on national income continued throughout the 1920s under King’s direction. These estimates of a total called the “Realized Income of the People of the Continental United States” were published in 1930 for the years 1909 through 1928 (King and

⁵ The modern income tax was first levied in 1913.

Epstein 1930). This volume also addressed the touchy subject of the distribution of income. First it presented estimates of the share of national income going to wages as opposed to salaries, pensions and so on, taking us back to Nearing's concerns. This share was found to be volatile and higher after the war than before, but no long-term trends were identified (King and Epstein 1930, 79-86).

King and Epstein then examined the distribution of income based mainly on the information generated by the federal income tax. Rather than presenting Lorenz Curves and Gini coefficients, or the even the shares of income going to top percentiles, King and Epstein opted to focus on the shares of the population earning more or less than several benchmark levels of income. The top group included those earning more than \$150,000 in 1913 dollars; about \$3.9 million today using the Consumer Price Index to inflate (Williamson 2019). In general, King and Epstein did not find worrying trends in the distribution of income. In a counterfactual thought experiment they concluded (1930, 178) that even a massive redistribution would not help those earning less than \$5,000 very much. His final conclusion (1930, 180) was that "there is practically no tendency towards the putting of more income into the hands of the extremely opulent sections of the community." The times had changed, and perhaps also King's disgust with "Monster Corporations" had cooled.

This book was not widely reviewed in the economic journals. It was, after all, a continuation of the 1921 study. In the most detailed review that I have found Paul Brissenden (1932), a noted labor economist at Columbia, hammered away at King and Epstein's treatment of inequality and concluded that a far less sanguine picture of the trends in inequality should be drawn from their data. But when he reflected on the overall quality of the

work he concluded that it was “undoubtedly, the most important contribution ever made to the study of income.”

4. Enter Simon Kuznets

When I asked Google “who invented Gross Domestic Product (GDP)?” the answer was “Simon Kuznets in 1934.”⁶ This is, at the very best, misleading. Estimates of national income have been made for centuries. The British economist (as he would now be identified) William Petty is said to have made the first estimates in the seventeenth century. In the United States, George Tucker, a southerner, and Ezra Seaman, a northerner, made important estimates before the Civil War. Their estimates were based on data from the U.S. Census and have been praised by modern students of national income accounting (Gallman 1961). Tucker and Seaman were concerned, especially in the revisions of their books made after the 1850 census (Seaman 1853, Tucker 1855), with the relative strength of the Free States and the Slave States. Moving from the 1850s to the 1940s we find Simon Kuznets similarly using estimates national income to analyze the war making potential of the United States.

Nor was national income ignored by the discipline’s leading theorists. The first sentence of Adam Smith’s the *Wealth of Nations*, the starting point of modern economics one could argue, is a description of the flow of goods and services to consumers (Smith, Adam 1976 [1776] I.i.10).

“The annual labour of every nation is the fund which originally supplies it with all the necessaries and conveniencies of life which it

⁶ On October 24, 2019. While GDP has become the statistic of choice for policymakers and journalists, Kuznets preferred, as I will explain below, gross national product (GNP) or better still net national product (NNP).

annually consumes, and which consist always either in the immediate produce of that labour, or in what is purchased with that produce from other nations.”

Well more than a century later, Arthur Cecil Pigou (1912), following his mentor Alfred Marshall, gave a starring role to what he called the National Dividend in his classic *Wealth and Welfare*. But for all that, Kuznets’s contributions were indeed critical to the development of national income accounting.

Kuznets was born in Pinsk in what is now in Belarus.⁷ His father was a banker. Subsequently the family moved to Kharkov in the Ukraine where Kuznets began his education. He came to the United States in 1922 with his younger brother Solomon, who also became a well-known economist, to join his father who had immigrated earlier. Kuznets studied economics at Columbia and earned his Ph.D. there under Wesley Mitchell. His dissertation, completed in 1926 and published by Adelphi, was *Cyclical Fluctuations; Retail and Wholesale Trade, United States, 1919-1925*. Kuznets means blacksmith in Russian, and his father had used the anglicized last name of Smith. Kuznets’s dissertation was written by Simon Smith Kuznets, but the Smith was dropped in subsequent publications.

Kuznets was appointed to the Bureau staff in 1927 where initially he worked on the business cycle (Rutherford 2011, 238). The emphasis on the business cycle at the Bureau in the 1920s made sense. The business cycle was Mitchell’s primary academic interest and the United States had suffered financial panics in 1907 and 1914, and a severe cyclical contraction in 1920-21.

⁷ This paragraph is based on Weyl (2011) and personal communications from Claudia Goldin.

Mitchell and Gay, however, had become concerned about the quality of King's estimates and decided to remove him from the Bureau, but acting on this decision had to be delayed because King was ill (Rutherford 2011, 286). In 1932 Kuznets was asked to survey the Bureau's work on national income with the idea that Mitchell would then supervise future work on national income with Kuznets under him.

I have not learned the main concerns of Mitchell and Gay. But Morris Copeland, a student of Mitchell, who would join the Bureau in 1945, wrote two papers for the *Journal of Political Economy* (1932a, 1932b) that while respectful toward King and Epstein's work were also critical of some of their decisions. Copeland thought that while their estimates had been done with great care and revealed the correct trend, they underestimated the volatility of national income. Copeland then presented revised estimates. The trends were nearly the same. Over the years when both series are available, 1910-1928, King and Epstein's estimate of national income in current dollars rose 5.81 percent per year while Copeland's revised series 5.75 percent per year.

The year-to-year changes which are shown in Figure 1 also seem quite close. The major difference is in the 1920-21 recession. King and Epstein's estimate falls 15.46 percent from 1920 to 1921, while Copeland's revised estimate falls 17.80 percent. In retrospect this may not appear to be a great difference. Both series document a major contraction. But with the Great Depression beginning the need to measure the extent of downturns accurately had become compelling. King and Epstein's last estimate, a preliminary estimate, was for 1928, so we don't know what they would have come up with for the Depression. But Copeland's series fell 8.4 percent

between 1929 and a preliminary figure for 1930 showing that a major contraction was underway.

The economic catastrophe from 1929 to 1932 produced a June 1932 Senate resolution, introduced by Senator Robert La Follette Jr., the Wisconsin Progressive, calling on the Department of Commerce to make estimates of national income from 1929-1931 (Dorfman 1959, p. 669). The point, clearly, was to justify sweeping governmental initiatives. The Department of Commerce turned to the Bureau for help and Kuznets, was seconded to the Department of Commerce to lead the team that would produce the estimates.

On his arrival Kuznets encountered and quickly recruited Robert R. Nathan, who had been his student at University of Pennsylvania, for the team he was assembling. The report was submitted to the Senate in January 1934 (U.S. Bureau of Foreign and Domestic Commerce 1934). It showed that national income had halved between 1929 and 1932. The depth of the Depression was obvious by that time, but the report was still an important call to action. President Roosevelt cited the initial figures when proposing his recovery program, and later cited the updated figures when he sent a supplemental budget to Congress in 1938 (Coyle 2014, 12–13).

Roosevelt also made use of the national income estimates on the campaign trail. In a speech at Pittsburgh's Forbes Field in October 1936 Roosevelt – after a several baseball analogies, this was, after all, the home of the Pittsburg Pirates – made the empirical case for the New Deal. He might have chosen one of the older statistics: industrial production, employment, and so on. But instead he used the new national income

statistics, explaining in his usual masterful fashion what they were and what they showed (Roosevelt, October 2, 1936, 2).

“By national income I mean the total of all income of all the 125,000,000 people in this country, the total of all the pay envelopes, all the farm sales, all the profits of all the businesses, of all the individuals and corporations in America,

During the four lean years before this administration took office that national income had declined from \$81,000,000 a year to \$38,000,000 a year – in short, you and I, all of us together, were making \$43,000,000 less in 1932 than we made in 1929.”

After detailing the actions taken by his administration Roosevelt returned to national income accounts to prove they had worked.

“The national income was thirty eight billions in 1932. In 1935 it was fifty-three billions and this year it will be well over sixty billions.”⁸

Roosevelt had shown the way. From then on politicians would be using national income statistics to highlight their successes and their opponent’s failures.

After getting things started at the Commerce Department, Kuznets returned to the Bureau. Nathan, his protégé, also left the Commerce Department but only for a short time. He soon returned to as chief of the National Income Section of the Division of Income Research (Durr 2013, 19-20). Subsequently the Divisions’ estimates were updated regularly and reported in the *Survey of Current Business* in articles written by Nathan.

Shortly after Pearl Harbor, Nathan was appointed chair of the Planning Committee of the newly created War Production Board, the agency charged with assuring that a sufficient supply of munitions would be

⁸ Somewhere along the way some zeros were omitted; the correct numbers were, of course, billions. But aside from that the numbers were accurate based on the estimates then available.

produced. Kuznets readily agreed to work for his protégé as the Committee's chief economist.

Before Pearl Harbor many liberal economists, including Nathan and Kuznets, were worried that the military was not expanding rapidly enough. Pearl Harbor, however, unleashed a flood of orders from the military. Nathan and Kuznets now worried that the spending plans of the military were too big. Excessive competition among contractors might slow production; there would be tanks without treads, aircraft without instruments, and factories without machines. And they worried that civilian consumption might have to be reduced to an unacceptable extent. In August 1942 Kuznets forwarded to Nathan a study which concluded that military spending of \$47 billion in 1943 and \$80 billion in 1943 were the limits of what was "feasible." The military was unhappy with these limits because they thought adopting them would delay the invasion of Europe and the end war. Thus was born the "feasibility dispute."

Eventually, a compromise was reached and the military services were forced to make some cuts in their immediate spending plans and to lengthen their time table for the invasion of Europe. The effects that would have followed if the military's spending plans had been carried out in full are hard to estimate. Counterfactual history is always difficult, and it is especially hard in this case because of the limited historical experience with rapid mobilization. But two careful students of the feasibility dispute have credited the economists with a crucial contribution to the ultimate success of the munitions program (Edelstein 2001, Lacey 2011). The subtitle of

Lacey's book makes the case as far as most economists are concerned: *Keep from All Thoughtful Men: How U.S. Economists Won World War II.*⁹

5. The Influence of Simon Kuznets

As we have seen, Kuznets did not invent national income accounting. But he did have an enormous influence on the way estimates of national income are made and used. Here I identify six sources of this influence, based first of all on Fogel, et al (2013).

(1) Kuznets was a leader in standardizing the definitions of the components of national income. He did so in part by exploring the philosophical underpinnings of the accounts.

He argued forcefully that the welfare of consumers should be, at least in peacetime, the ultimate determinant of how national income is measured. This meant, first of all, focusing on the flow of goods and services to consumers. This, of course, was not new. The *Wealth of Nations*, as I noted above, began with a description of the flow of goods and services to consumers. But Kuznet's determination to follow this lodestar helped him unravel many knotty problems in national income accounting.

Kuznets's focus on consumer welfare, for example, explains why he favored Gross National Product (GNP) over GDP. Think of a country with a large sovereign wealth fund. GNP would exceed GDP by a substantial margin and GNP would provide a better measure of the flow of goods and services to consumers, and therefore a better measure of the welfare of the

⁹ The first part of Lacey's title was from a memo written by General Brehon B. Somervell, head of Army supply service, describing the memo written by Nathan based on Kuznets's study.

population. In fact, Kuznets preferred to work with NNP rather than GNP because deducting the depreciation of capital would bring us still closer to the flow of goods and services to consumers. But, of course, good scholar that he was, he would use GDP when that was all that was available (Kuznets 1956, 11).¹⁰

It was, as we know, GDP that became standard. Partly this was because it was easier to compute and so more countries could produce the statistic. And It is also true, as Coyle (2014, 20) explains, that the rise of Keynesian economics played an important role. Domestic production one might assume was more closely tied to employment, the key concern in the wake of the Depression, than the flow of goods and services to consumers. So GDP would be a better guide than other income measures for policymakers intent on managing the business cycle and maintaining full employment.

While Kuznets began with the goods and services consumed and their market prices he recognized that many decisions had to be made before final totals could be calculated; decisions that raised important philosophical questions, especially if those totals were to be used in examining long-term trends in economic welfare. These concerns were present from the beginning of Kuznets's work on national income, indeed from the beginning of the Bureau's work on national income. The initial report on national income by the Commerce Department, much of it probably written by Kuznets, contains careful discussions of the many limitations of the national income statistics. At the end of this discussion the report summarizes with the following often quoted conclusion about the

¹⁰ In a JSTOR search this was the first time that Kuznets used the term gross domestic product. The term had been used previously mainly in British journals.

relationship between national income and national welfare (U.S. Bureau of Foreign Domestic Commerce 1934, 7).

“The welfare of a nation can, therefore, scarcely be inferred from a measurement of national income as defined above.”

The following are some examples of adjustments to the basic spending totals that Kuznets thought were potentially justified, depending on the purposes of the user of the estimates, even if the data was not then available to act on them.

(a) There was the long recognized problem of production in the home. This was especially a problem when using estimates of national income to examine long-term trends because of the shift of production from the home to market. In his 1941 book that presented estimates of national income for 1919-1938 Kuznets prepared a conjectural estimate of the value of services carried out by housewives in 1929. This estimate was 23 billion dollars “somewhat more than one-fourth of total national income in 1929” (Kuznets 1941, 433). As a share of national income this was actually less than a similar estimate reported in the Bureau’s first study of national income which put the non-monetized production of women working in the home at slightly less than one-third of measured national income in 1919 (Mitchell, et al 1921, vol. 1, 58-64).

But if the problem of non-monetized production in the home was understood, and at least partial estimates could be made, even if subject to a wide margin of error, shouldn’t they be included in the total? Kuznets did not take a hard and fast line. Rather, he thought that some investigators, depending on their purposes, might want to include non-monetized production in the home. This might be the case, for example, when

estimating regional incomes (Kuznets 1940, 300), comparing income in pre-industrial economies with income in industrial economies (Kuznets 1949, 211), or exploring the size distribution of income using the family as the unit of analysis (Kuznets 1976, 85). But Kuznets (1941, vol. 2, 431) concluded that for most purposes exclusion was best.

“The conditions under which they [non-monetized home production] are carried on and the factors that affect the amount of income from them are so vastly different from those that bear upon activities whose products usually appear on the market place that it seems best to exclude them.”

(b) Goods that were purchased by individuals as instruments of production, Kuznets thought, ideally should be deducted, from Net National Product (NNP). Kuznets’s example was the additional cost of an expensive as opposed to a utilitarian automobile. The extra expense might be consumption for an economics professor, but a cost of production for a real estate agent. In the latter case the extra expense should be deducted.

(c) Personal costs of production needed to offset “the strains and pressures of modern life,” ideally, should also be deducted if one was seeking a measure of national welfare.

(d) Kuznets also thought about how the distribution of income might impact the measurement of national income. Again ideally, he thought that the amounts consumed by individuals should be

“...combined by an acceptable system of weights, based on some cogent theory of equivalence of individuals, not by the market prices that reflect monopolistic distortions and inequalities in distribution of income by size” Kuznets (1947, 23).

(e) The most controversial of Kuznets’s efforts to apply a consistent philosophical framework to his estimates of national income spawned a

debate that he ultimately lost. Kuznets thought that in peacetime most military spending should be excluded from national income. Why? For Kuznets military spending was an intermediate good not a final good like wheat or haircuts that directly produced utility for the consumer. The cost of the scarecrow that keeps the crows from the wheat is already included in the price of the wheat. The military which scares away our enemies and prevents them from attacking our fields of wheat is similarly an intermediate good.¹¹ In World War II, however, Kuznets (1945, 17) thought that

“for the transient period of a major war we might recognize two purposes coequal in primacy: provision of goods to consumers and for war use.”

Kuznets went on to make detailed estimates of NNP and GNP on this wartime basis. Kuznets’s peacetime concept of NNP (1961, 487) increased by 20 or 21 percent between 1939 and 1941, depending on the concept of NNP, but then fell by 7 or 8 percent between 1941 and 1943. His wartime version of NNP (1945, 54), on the other hand, rose somewhere between 24 and 28 percent from 1939 to 1941, depending on the assumptions made about efficiency in the munitions industries, and then rose a further 16 to 36 percent between 1941 and 1943.

After the war Kuznets wanted to return to his peacetime definition of national product that excluded consumption of war goods. But the Commerce Department decided to include current consumption of military goods. There were, probably, several reasons. In part, including military spending made sense because the role of the military in peacetime had changed. In his study of productivity for the Bureau John Kendrick (1961,

¹¹ This is, of course, my analogy (originally intended for my undergraduate students) and not Kuznets’s.

25), for example, utilized a version of Kuznets's national product estimates that included military spending on the grounds that national security is "at all times" a prime objective. We hadn't returned to the economy of the 1920s when it was assumed that the military would have little to do. Rather, we had moved from a shooting war to a *cold war*. Another important factor, as noted above, was the rise of Keynesian economics. After the war it was generally accepted by economists that increases in government spending on the military directly, and through their multiplier effects, increase total spending and employment. Therefore, including military spending in GDP would help policymakers calibrate their macroeconomic policies.

It is interesting in this context to consider Robert Higgs's (1992) argument that military spending should be excluded even during a war. Higgs's goal, I believe, was to demonstrate that "wartime socialism" (my term) had not improved the general welfare. The contrast between Kuznets and Higgs illustrates Kuznets's point that the ultimate measure of national income chosen will depend on the purposes for which the calculation is being made. There is no single right measure of national income.

(2) Kuznets built on the tradition established by Mitchell and his collaborators in the Bureau's first study of national income of explaining the sources of his data and the margins of error in complete detail. No reader could be in doubt as to the amount of work that went into constructing the estimates or the likelihood that they could do better. This approach, along with the discussions of the philosophical underpinnings of the estimates produced enormously persuasive documents.

(3) Kuznets was also remarkably creative when it came to finding sources of data and enormously effective in demonstrating to his students and colleagues how to do it. Nathan (1994, 3) recalled what it was like to

work under Kuznets's direction to produce the first Department of Commerce estimates.

“We had to do our own quickie surveys. We found a survey here, a master's thesis there, or a Ph.D. dissertation somewhere else. Bit by bit we assembled bases for estimates from scattered studies and reports to develop reasonable estimates.”

One of the surveys undertaken by the Commerce Department for those first official estimates became the basis for an important book by Milton Friedman and Kuznets (1945): *Income from Independent Professional Practice*, which also served as Friedman's Ph.D. dissertation.

(4) Kuznets also contributed to the development of national income accounting by showing the value of carefully constructed national accounts for addressing a wide range of important questions. In World War II for example, as I noted above, he argued forcefully that the military's spending plans were infeasible. That argument was effective because he was able to bring the national income estimates to bear.

After the war Kuznets focused first on the distribution of income, the concern that had motivated establishment of the Bureau. In 1950 the Bureau published “Shares of Upper Income Groups in Income and Savings.” Economists had long argued that one of the key benefits of inequality was that it increased savings because the rich saved more than the poor. But Kuznets wanted to know, as he always did, how good the quantitative data was and what did it show. In this paper he showed that the affluent did provide a large and stable share of total savings. The top 5% of households measured by their share of income accounted for about two-thirds of the nation's saving (Kuznets 1950, 52) and their savings rate

varied less over the business cycle than the savings rate of the less affluent.

Kuznets's work on the distribution of income led eventually to his famous presidential address to the American Economic Association, "Economic Growth and Income Inequality" (1955). It was in this address that he described what became famous as the "Kuznets Curve"; the "inverted U" relationship between economic development and income inequality. Kuznets concluded, tentatively, that inequality rose in the early stages of economic development, but that there was some evidence that it fell in later stages. Whatever one may think of the long-run relevance of the curve, the address still stands as a model of careful handling of empirical data in an attempt to answer an important question.

After the war Kuznets also intensified his research on economic development, work for which he ultimately became the second American to win the Nobel Prize in economics (1971). Again, Kuznets's work demonstrated the worth of carefully compiled estimates of national income.

(5) Kuznets was a major institution builder and educator. The Bureau's Conference on Research on Income and Wealth which played a major role in developing and standardizing the methodology of national income accounting was his idea. Founded in 1935 its first publications dealt with the measurement of income and its distribution by size. The Conference has produced over seventy books examining issues in economic measurement, Fogel et al (2013, 110-112).

(6) Finally, there was an aspect of Kuznets's legacy that is hard to quantify -- an unfortunate admission in a paper about the Bureau -- but nevertheless important: he was an inspiring teacher and mentor. One can point, of course, to some of his outstanding students such as, Nobel Prize

winners Milton Friedman and Robert Fogel. But exactly how he inspired his students is unclear. Robert Nathan (1994, 1) remembered his classes with Kuznets this way.

“I learned to always sit in the front row because I had trouble hearing his lectures - he mumbled, and he chewed his words. One had to listen carefully to put it all together. But he was an excellent teacher, and his brilliance revealed itself from the first day of his classes. I thoroughly enjoyed my two graduate years with him.”

Moses Abramovitz (2001, 98) remembered the audience’s reaction at the celebration of Kuznets’s 80th birthday at Harvard to a story about Kuznets’s continued desire to discuss Abramovitz’s research long after they both had left the Bureau.

“To my surprise and pleasure, as I went through my story, I sensed an empathetic reaction from the audience. Others had feelings like my own. Love mixed with awe.”

6. The Test of Time

How well have the efforts made at the Bureau to measure national income stood up? Did later researchers find conceptual or methodological errors or new sources of data that required substantial revisions? Many criticisms of the conceptual basis of the national income accounts have been leveled over the years. I alluded to some of them above when discussing Kuznets as the philosopher of national income. But it is worth recalling them here by way of illustrating that criticisms of the conceptual basis of their estimates were always taken seriously by the economists at the Bureau, even if they were not always able to deal with them to everyone’s satisfaction.

(1) For example, it has often been pointed out that non-monetized production within the household is excluded from GDP and other measures of national income. This was recognized, as I noted above, in the Bureau's first book, *Income in the United States* by Mitchell and his collaborators and in Kuznets's subsequent work. (2) John W. Kendrick (1961) relied on Kuznets's estimates for his famous and still important study of total factor productivity. However, as I noted above, he rejected Kuznets's exclusion of a good part of military spending from the peacetime totals. (3) Friedman and Schwartz (1982) used Kuznets's estimates of NNP in their studies of the demand for money reported *Monetary Trends in the United States and the United Kingdom*. But they were skeptical of Kuznets's deflator for World War II and for 1971 to 1974. They thought that price controls had produced quality deterioration, black markets, and other forms of evasion which meant that the measured rate of inflation understated the true rate of inflation. They then devised a technique for generating what they regarded as more accurate measures of wartime inflation, using nominal income as an interpolator for the price level.¹²

(4) Recently, one of the frequent complaints voiced by critics of the national income estimates is that the estimates do not adequately stress rising inequality and therefore give a misleading picture of how well the economy is doing, and how well it is providing for the average citizen. We have returned in other words to the concerns that motivated formation of the Bureau. The response of the Commerce Department will be to release estimates of income by distributional class alongside its estimates of total

¹² Mills and Rockoff (1987) also attempted to improve on the measured deflator for WWII, and came up with somewhat different estimates. But, of course, all such estimates are subject to a wide margin of error.

income (Leonhardt 2019). The goal of the advocates of this change in the Commerce Department's policies, of course, is to reinforce calls for redistribution. The Bureau, as we have seen, was concerned from the beginning with the distribution of income. There were chapters on the distribution of income in its first study, as announced in the full title: *Income in the United States, its Amount and Distribution, 1909-1919*. King and Epstein discussed the distribution of income when they extended the Bureau's estimates through the 1920s. And as I noted above, Kuznets published a number of important studies of the distribution of income and its impact on the economy which culminated in his famous presidential address to the American Economic Association (1955).

These complaints aside, how well have the early estimates produced by the Bureau and the Commerce Department with the Bureau's help stood up? Five series are plotted in Figure 2 which covers 1913 to 1929. The upper three are estimates of real GNP; the lower two are estimates of real NNP. As you can see, the estimates of real GNP by Nathan S. Balke and Robert J. Gordon (1989) and Christina Romer (1989) are very similar to Kuznets (1961) in the 1920s when all three are available. The estimates of real net product by King and Epstein (1930) and Kuznets (1961) are also very similar when both are available. Later writers, of course, did not start from scratch. They built on the foundations laid at the Bureau; an important endorsement of the Bureau's work. It is clear, moreover, that later writers did not find errors that would change our picture of the macro-economic history of the 1920s.

The motivation for the creation of Commerce Department estimates was to document the severity of the Great Contraction and reinforce Progressive calls for action to address the crisis. So let's compare those

estimates with later estimates. Tables 1 (nominal) and 2 (1929 prices) show the levels of various estimates in 1929 and 1932 and the percentage changes between 1929 and 1932, 1937 and 1938, and 1929 and 1939.¹³ These dates correspond to the main turning points in the Depression. There was a severe contraction from 1929 to 1933, a rapid but incomplete recovery, a short but severe contraction in 1937 and 1938 (the “recession within the depression”), leaving an economy that had not fully recovered by the end of the decade. I have included most of the estimates of national income that have been used frequently by economic historians so that the reader can peruse the tables and make the comparisons that are of most interest to them.

Rows 1 and 2 of Table 1 show the original estimates made at the Commerce Department under Kuznets’s direction. They document a tremendous contraction of nominal income between 1929 and 1932 as no doubt Senator Lafollette and other Progressives thought they would. There are differences with subsequent estimates, reflecting in part conceptual differences, but in general they are in the same ball park. The original estimates are quite close, for example, to the estimates of national income included in the year 2000 edition of *the Historical Statistics of the United States*. Evidently, nothing had come to the attention of the compilers that would justify inclusion of far different estimates.

The Commerce Department did not publish estimates of real national income in their summary tables. They simply showed the Bureau of Labor Statistic’s indexes of wholesale prices and the cost of living alongside the estimates of nominal income so that readers could make their own

¹³ Most of the series bottom in 1933, but here I show 1932 values to facilitate comparison of the first Commerce Department estimates with estimates made later.

comparisons. As a simple expedient, I used an average of the two indices to deflate the estimates of nominal income. It might be possible to produce a better estimate by combining the sub-sector estimates expressed in 1929 prices that were included in the report. But for my purposes this makeshift should do. The results are shown in rows 1 and 2 of Table 2. Evidently, the Commerce Department estimates of real national income are similar to later estimates. The first Commerce Department estimates of National Income Produced, deflated with my makeshift price index, falls 44.8 percent (Table 2 row 1), and National Income Paid Out falls 29.3 percent (Table 2 row 2). The most recent Bureau of Economic Analysis estimate of NNP (Table 2 row 9) falls 33.4 percent between 1929 and 1932.

Rows 3-17 of Table 2 show many of the subsequent estimates of real national income made by Bureau researchers and by the U.S. Bureau of Economic Analysis. The numbers differ from one set of estimates to another because of differences in the concept of national income, and also because of differences in the sources of data exploited, but the broad-brush picture of the Depression painted by each is similar. The decreases between 1929 and 1932 in real NNP range from -54.1 percent (Table 2 row 3) in Kuznets (1937) to -33.4 percent in the most recent National Income and Product Account estimates (Table 2 row 9). The Kendrick and Kuznets estimates are generally similar; they differ only by the amount of national defense spending, but this was a minor factor during the 1930s.

Each series documents an devastating collapse between 1929 and 1932, then a recovery interrupted by the 1937-1938 recession, so that by the end of the decade real income was only a few percent above the level in 1929. The population of the United States rose a bit more than 7 percent between 1929 and 1939. Therefore, even the modern chained indexes of

real national income which show the most growth imply an increase in income per capita of only 2 or 3 percent between 1929 and 1939: a lost decade. Scholars have had time to ponder the early estimates, to find new sources of data, and to refine the methodology for producing estimates of national income. But the picture of the Depression developed by Kuznets and by the team Kuznets helped to create at the Commerce Department is very similar to recent efforts.

Figure 3 takes a longer view and shows five measures of real NNP from 1929 through 1955. The modern chained index declines a bit less during the Great Contraction than the earlier fixed-weight estimates. The explanation may be that as incomes fell people spent a larger fraction of their remaining income on lower-priced necessities and a smaller share on higher priced luxuries; more on bread and less on jewelry. The effect of this change in spending patterns would have moderated the extent of the decline in the prices were chained. Clearly, however, all of these series tell similar stories for the Depression decade as might be expected from Tables 1 and 2.

However, the estimates diverge during the war and follow somewhat different patterns through the first part of the 1950s. I have plotted Kuznets's Variant III, a "peacetime" estimate in Kuznets's lexicon, which declines during the war because current military spending (but not additions to the stock of munitions) are excluded. As noted above, Kuznets did prepare alternative estimates for the war years that included all military spending because he thought that military spending had become a prime objective coequal with the supplying of goods and services to consumers.

The Friedman and Schwartz measure, also shown in Figure 3, includes military spending during the war, and so rises more than Kuznets's

peacetime-concept estimates. But it rises less than the other measures of NNP because Friedman and Schwartz adjust the price level upward for black markets and other forms of evasion of price controls.

The modern chained index grows more rapidly during the war and afterwards. It was probably working as intended, responding quickly to changes in the way the people spend their income. Sectors experiencing rapid technological change were the recipient of more spending and yet experienced lower inflation. Continually giving these sectors more weight produced lower measured inflation and a higher rate of growth of real income.

All in all, the early estimates of national income made by researchers at the Bureau or at the Commerce Department with the help of the Bureau have stood the test of time. Later investigators have made adjustments to these early estimates. But recent estimates are usually in the same ballpark, indeed, one is tempted to write that often they are in the same infield.

7. Conclusion

The Bureau was a product of the bitter controversies over the distribution of income that roiled the United States at the turn of the nineteenth century. Indeed, the Bureau began life as “the Committee on the Distribution of Income.” Progressives claimed that the distribution of income was increasingly distorted by the predation of the Robber Barons; while others blamed the end of the frontier or immigration for adverse trends or denied that such trends existed. But what were the facts? Scott Nearing and Willford King had produced estimates of national income and its distribution

and addressed the causes for the trends they found. One is reminded of Piketty (2014). But how could the public be sure that these were unbiased estimates? Two economists, Malcolm Rorty and Nahum Stone, won financial support for an organization with the mission of producing reliable estimates and, hopefully, sufficient resources to accomplish the task.

The Bureau was chartered in 1920 and Wesley Mitchell, an economist already well known for his number based studies of the greenback and the business cycle was appointed the first director. The Bureau's first study *Income in the United States, Its Amount and Distribution* was published in 1921. Written by a team directed by Mitchell that included Oswald Knauth, Frederick Macaulay and King, and nearly 600 pages in two volumes, won widespread praise for the care, thoroughness and sophistication that were deployed in determining the level and distribution of income. True to what became the guiding philosophy of the Bureau, this volume made no policy recommendations. The Bureau's estimates of national Income were extended through the 1920s by King and Epstein.

The Great Contraction, 1929-1933 produced renewed calls for reliable economic data. Progressives wanted rigorously constructed and therefore persuasive estimates produced by the Federal Government that they thought would help underline the severity of the contraction. Simon Kuznets was seconded from the Bureau to the Department of Commerce where he led a team that produced the first federal estimates of national income and established the administrative organization for producing regular updates. Kuznets did not invent GDP, as often claimed, but he had enormous influence as a philosopher of national income accounting and as a skilled practitioner and teacher. Subsequently, some scholars have

criticized aspects of the early estimates, but the picture those estimates painted of the Great Depression has held up well.

In short, the Bureau's efforts to produce accurate measures of national income and to disseminate them with detailed explanations of the underlying philosophy and methods was a response to intense political controversies at the turn of the 19th century. The result was an important and enduring legacy.

**Table 1. Changes in National Income during the Great Depression
(Billions of Dollars at Current Prices)**

	Variable	Source	1929	1932	Change 1929-32 %	Change 1937-38 %	Change 1929-39 %
1	National Income Produced	U.S. Bureau of Foreign Domestic Commerce 1934, 10	83.0	39.4	-74.6	NA	NA
2	National Income Paid Out	U.S. Bureau of Foreign Domestic Commerce 1934, 10	81.1	48.9	-50.7	NA	NA
3	National Income	<i>Historical Statistics 2000, Series Ca6</i>	86.8	43.9	-68.2	-9.3	-17.5
4	National Income	U.S. Bureau of Economic Analysis, 2020	94.2	51.3	-60.8	-8.3	-13.3
5	NNP	Kuznets 1937, 8	83.4	39.6	-74.4	NA	NA
6	NNP Variant I	Kuznets 1961, 486	87.2	42.9	-70.9	-7.4	-20.3
7	NNP Variant II	Kuznets 1961, 486	93.7	47.3	-68.4	-8.3	-19.9

8	NNP Variant III	Kuznets 1961, 486	90.3	44.8	-70.1	-8.8	-20.2
9	NNP	U.S. Bureau of Economic Analysis, 2020	94.9	51.5	-61.1	-7.3	-12.6
10	GNP	Kuznets 1937, 8	93.6	47.2	-68.5	NA	NA
11	GNP, Variant I	Kuznets 1961, 486	98.4	51.5	-64.7	-6.0	-17.6
12	GNP, Variant II	Kuznets 1961, 486	104.9	55.9	-62.9	-6.9	-17.5
13	GNP, Variant III	Kuznets 1961, 486	101.5	53.4	-64.2	-7.1	-17.6
14	GNP	U.S. Bureau of Economic Analysis, 2020	103.9	58.5	-57.4	-6.7	-12.9
15	GDP	U.S. Bureau of Economic Analysis, 2020	104.6	59.5	-56.3	-6.3	-11.2

Notes: (1) Percent changes are the difference in natural logarithms multiplied by 100. The result is usually close to the difference in the two values divided by their average and multiplied by 100.

(2) The term "National Income" is used here in most cases as a generic to cover NNP, GNP, GDP and the like. In row 3, however, it refers to the aggregate designated as National Income in the National Income and Product Accounts.

**Table 2. Changes in National Income during the Great Depression
(Billions of Dollars at 1929 Prices)**

	Variable	Source	1929	1932	% Change 1929-32	% Change 1937-38	% Change 1929-39
1	National Income Produced	U.S. Bureau of Foreign Domestic Commerce 1934, 10	83.0	53.1	-44.8	NA	NA
2	National Income Paid Out	U.S. Bureau of Foreign Domestic Commerce 1934, 10	81.1	60.5	-29.3	NA	NA
3	NNP	Kuznets 1937, 8	83.4	48.6	-54.1	NA	NA
4	NNP variant I	Kuznets 1961, 487	86.9	56.0	-43.9	-6.8	0.1
5	NNP variant II	Kuznets 1961, 487	93.4	60.8	-42.9	-7.9	-0.2
6	NNP variant III	Kuznets 1961, 487	90.3	60.3	-40.2	-8.2	2.2
7	NNP – National Security Version	Kendrick 1961, 291	91.1	61.0	-40.1	-8.0	2.5
8	NNP	Friedman and Schwartz 1982, 124-125	90.3	60.3	-40.4	-8.2	2.1
9	NNP, Chained Prices	U.S. Bureau of Economic Analysis, 2020	94.9	68.0	-33.4	-3.9	10.2
10	GNP	Kuznets 1937, 8	93.6	58.3	-47.4	NA	NA

11	GNP variant I	Kuznets 1961, 487	98.0	66.4	-38.9	-6.0	0.2
12	GNP variant II	Kuznets 1961, 487	101.5	71.2	-38.4	-6.9	0.1
13	GNP variant III	Kuznets 1961, 487	101.4	70.7	-36.1	-7.2	2.2
14	GNP – National Security Version	Kendrick 1961, 290	102.1	71.2	-36.0	-7.1	2.3
15	GNP Chained Prices	U.S. Bureau of Economic Analysis, 2020	105.3	78.4	-29.5	-3.3	9.4
16	GDP	<i>Historical Statistics</i> 2000, Series Ca6	103.7	77.2	-29.6	-3.6	9.4
17	GDP, Chained Prices	U.S. Bureau of Economic Analysis, 2020	104.6	78.0	-29.3	-3.4	9.7

Notes: (1) Percent changes are the difference in natural logarithms multiplied by 100.
(2) The data from *Historical Statistics* was in 1996 dollars and the data from the National Income and Product Accounts was in 2012 prices. Each observation was multiplied by the ratio of the 1929 value in current prices to the 1929 value in 1996 or 2012 prices to facilitate comparisons with the other series.

Figure 1. Two Estimates of Changes in National Income 1911-1930

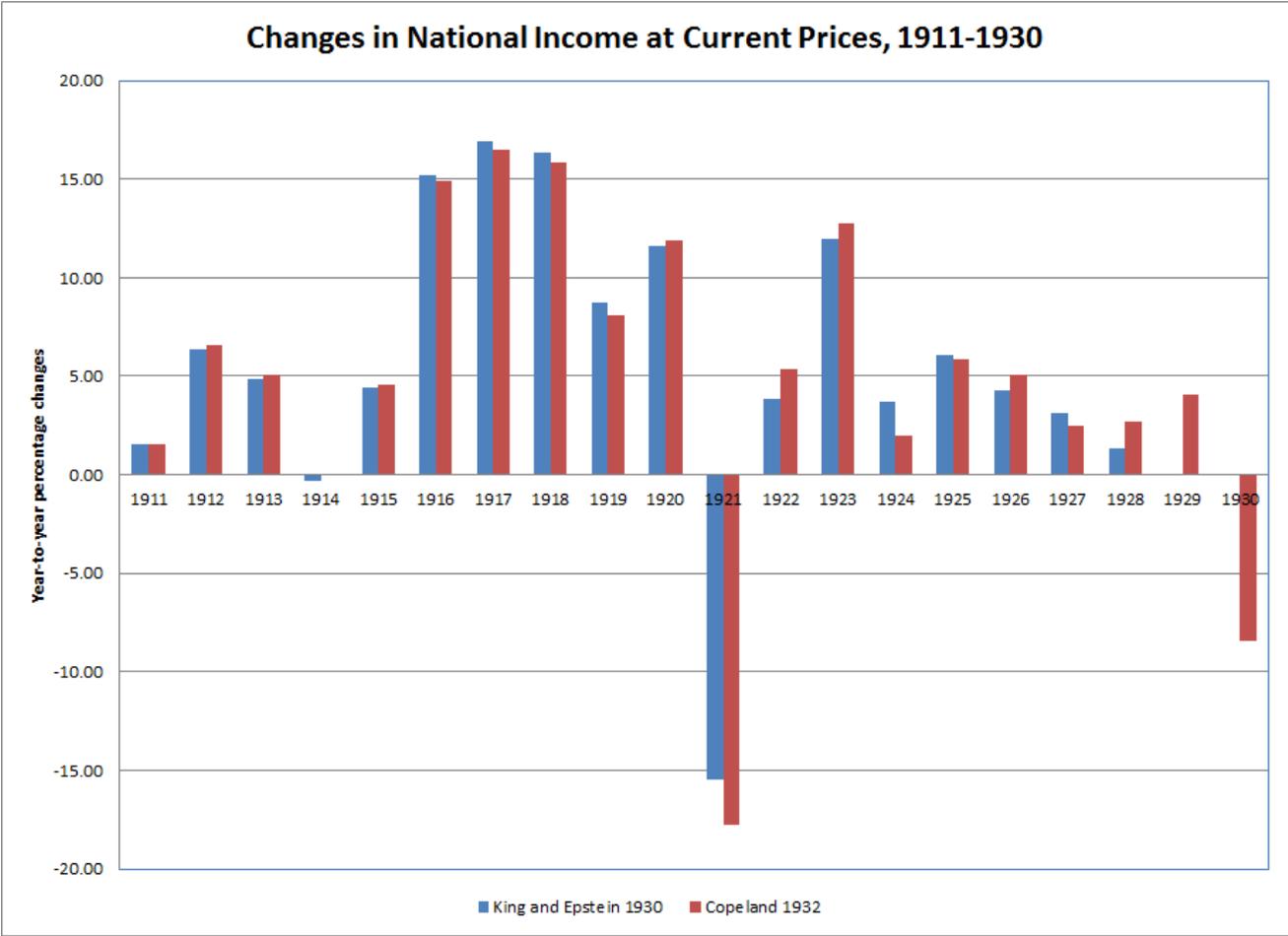


Figure 2. Estimates of NNP and GNP in Constant Dollars, 1913-1929

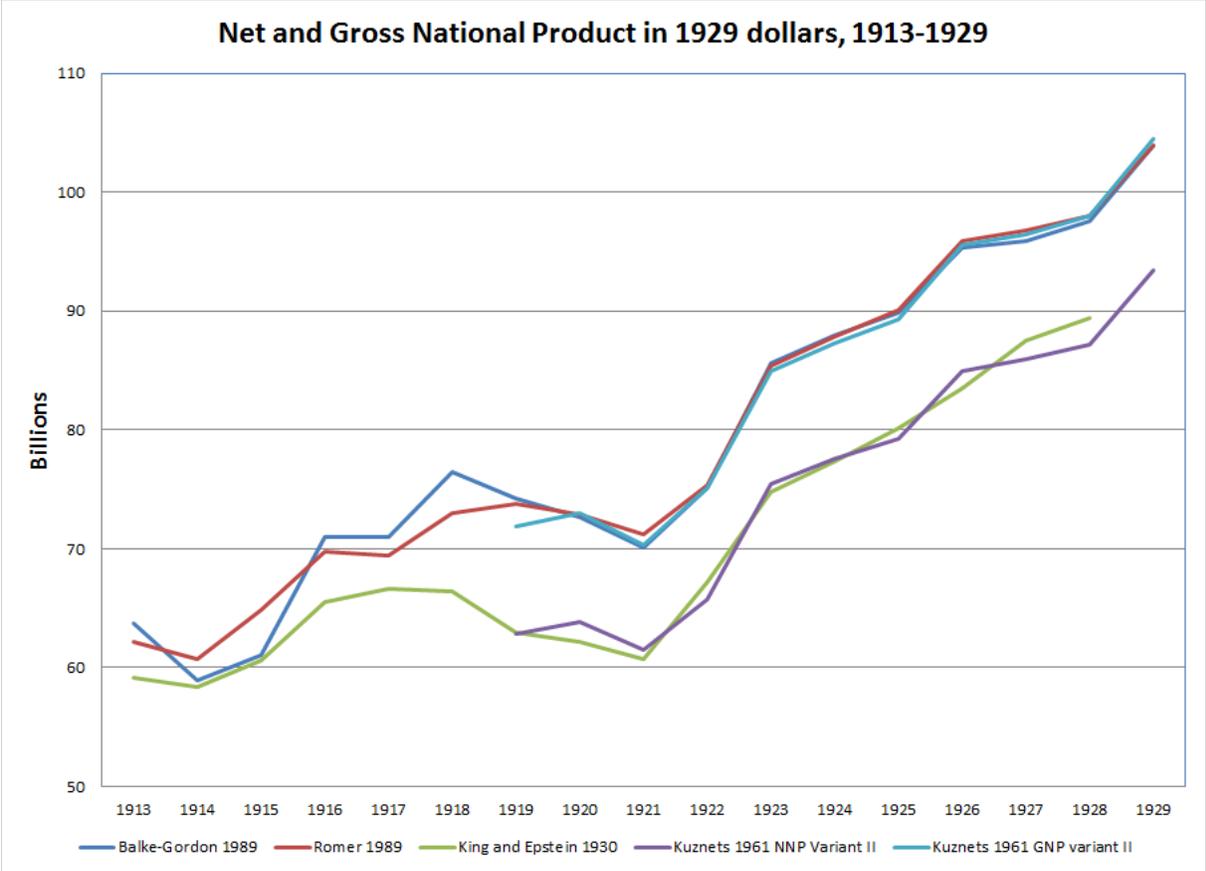
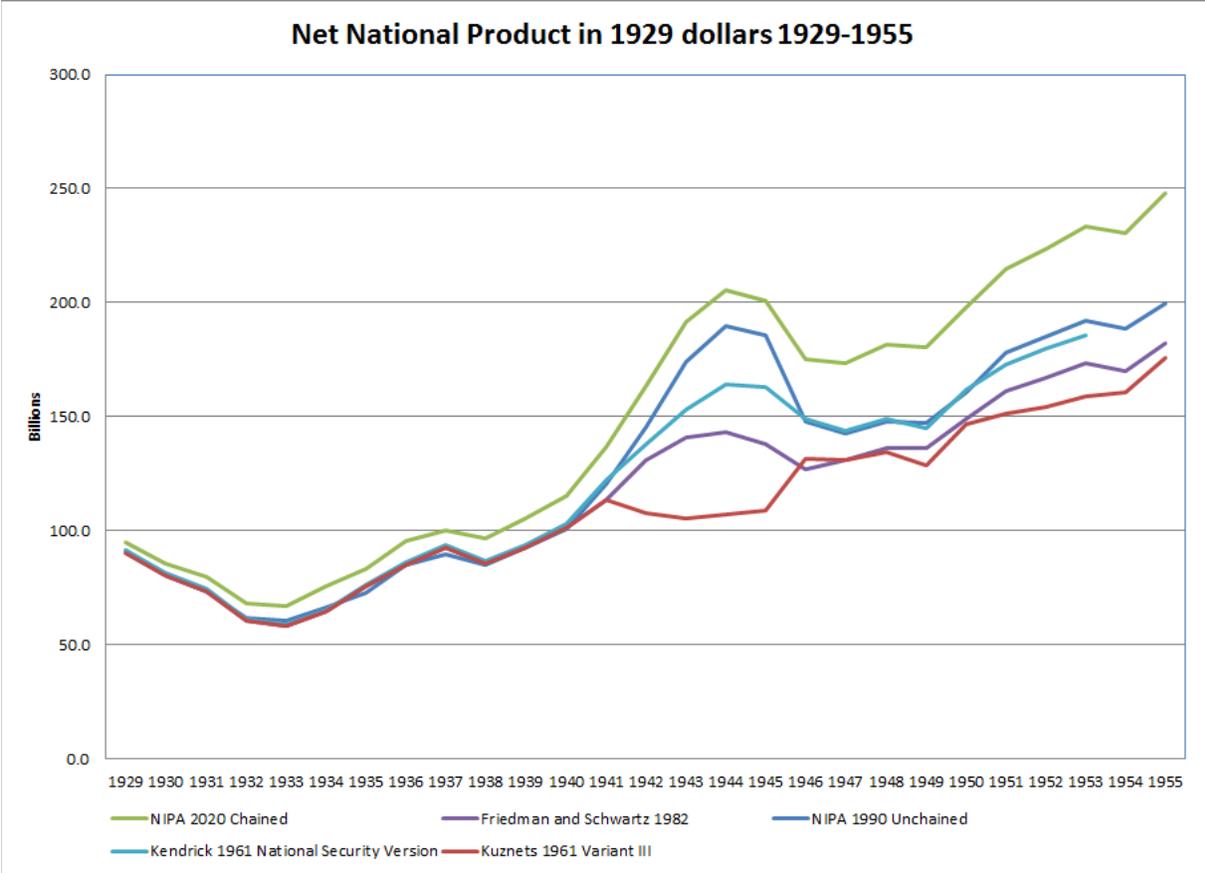


Figure 3. Five Estimates of Real NNP in Constant Dollars, 1929-1955



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