Source note for US GDP, 1789-2002

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This is, to our knowledge, the first easily available, complete, annual series on Gross Domestic Product (GDP) from 1789 to the present. It is the product of much work that has been done by many scholars and represents our best judgment regarding currently available sources.

A central point to keep in mind is that the quality of the data deteriorates the farther back in time one goes. The reason for this is simple: GDP was not measured before the 1930s and thus any measures for years before 1929 rely on sources that were not collected for the purpose of constructing national income and product accounts. See Bureau of Economic Analysis (2000) for a historical overview of the national income accounts and national income accounting.)

This note describes the sources that were used and the techniques applied to those sources to construct the data series. The first section lays out the sources and techniques used in constructing the numbers. The remaining sections provide background on the sources and the choices made in constructing the estimates; the discussion proceeds in reverse chronological order.

Basic sources and techniques for GDP, 1789-Present

1. Nominal GDP (in billions of dollars)

1789 to 1860: each decade uses Weiss (1992) benchmarks for 1800, 1810, 1820, 1830, 1840, 1850, and 1860. These data were then interpolated using the annual data from Berry (1988), Table 3, p. 18.

1860-1868: These data were interpolated using the annual data from Berry (1988), and the 1860 observation from Weiss (1992) and the 1869 observation from Balke and Gordon (1989)

1869-1928: Balke and Gordon (1989), Table 10, pp. 84-5 provides nominal GNP. The difference between Gross National Product GNP and GDP is net international factor income (NFI). Matthew Simon (1960) published an estimate of NFI in millions of nominal dollars from 1869 to 1900. This was converted to billions dollars and then added to the Balke-Gordon GNP to create an estimate of nominal GDP for 1869 to 1900. Historical Statistics (1975) provides estimates of NFI in millions of nominal dollars for 1901 to 1928; these are the official Department of Commerce figures for the US balance of payments. This was converted to billions of dollars and added to the Balke-Gordon GNP to create an estimate of nominal GDP for 1901 to 1928.

1929-present: Bureau of Economic Analysis at http://www.bea.gov

2. Real GDP (in billions of 1996 dollars)

1789-1833: each decade uses Weiss (1992) benchmarks for 1800, 1810, 1820, 1830, 1840, 1850, and 1860. The data were then interpolated using the annual data from Berry (1988), Table 3, p. 24. Finally, these data were multiplying by 16.46, the ratio of real 1869 GDP in 1996 dollars to real 1869 GDP in 1860 dollars.

1834-1859: Annual data from Rhode (2002), Table 1, column 7, were used to interpolate the decadal data from Weiss (1992) and then converted to 1996 dollars by multiplying data by 16.46.
1860-1868: These data were interpolated using the annual data from Berry (1988), and the 1860 observation from Weiss (1992) and the 1869 observation from Gallman (1966) and then converted to 1996 dollars by multiplying data by 16.46.

1869-1928: The nominal GDP series described above was deflated into 1982 dollars using the Balke-Gordon deflator. This was then converted to 1996 dollars by multiplying by 1.1678 (the ratio of real 1929 GDP in 1996 dollars from the BEA to real 1929 GDP in 1982 dollars as computed above.)


3. Implicit GDP deflator (1996 = 100)
Nominal GDP divided by real GDP multiplied by 100

4. Resident population (in millions)

5. Nominal GDP per capita
Nominal GDP divided resident population.

6. Real GDP per capita
Real GDP divided by resident population.

The foundation: Kuznets and the Department of Commerce estimates

The United States Department of Commerce has named ‘the development of the national income and product accounts as its achievement of the century.’ (Bureau of Economic Analysis 2000) In the early 1930s, the department commissioned Simon Kuznets to develop national income and product accounts and “the original set of accounts was presented in a report to Congress in 1937 and in a research report, National Income, 1929–35.” (Bureau of Economic Analysis 2000, 6) Kuznets continued to refine these estimates throughout the 1940s and 1950s and extended his work back to 1869. The final results were published in Kuznets (1961).

The Department of Commerce constructs annual and quarterly estimates of real and nominal GDP and regularly revises the historical estimates back to 1929. These are the numbers that are presented for 1929 to the present.

Extending the estimates back in time: Kuznets, Kendrick, Gallman, and GDP from 1869-1928

John Kendrick (1961), who worked with Kuznets at the Division of Economic Research, modified Kuznets’ original estimates for 1889 to 1928 to include government spending. This was necessary because Kuznets treated most government expenditure as an intermediate good while the Department of Commerce treated such spending as final product. This created a GDP series from 1889 to 1928 that was consistent with the Department of Commerce data.

Robert Gallman (1966) used information from the 1870 and 1880 censuses to create new estimates of GDP in 1870 and 1880. Kuznets (1961) had noted that he felt his 1869-1870 estimates was too low and the resulting growth rates from the early 1870s through the 1880s were thus too high. This, combined with Kendrick’s work for 1889 to 1928, created a revised version of Kuznets estimates for the period 1869 to 1928.
The resulting series is often referred to as the Kuznets-Kendrick-Gallman (KKG) series and was the standard data source until the late 1980s.

**Trends and cycles: Romer and Balke-Gordon revisions for 1869-1928**

Christina Romer, in a series of papers (1986, 1989a, 1989b), argued that the KKG series was “excessively volatile.” She presented new data on GDP that showed that business cycle lengths and amplitudes were roughly the same before and after 1929.

Nathan Balke and Robert Gordon (1989) challenged Romer’s estimates, pointing out that she had applied new statistical techniques to the original data but had not added any additional information. Balke and Gordon used additional information on output in transportation, communication, and other services to recompute the KKG series. They found that business cycle lengths and amplitudes were larger before 1929 than after 1929.

An important point to keep in mind about these series is that although they differ in their cyclical properties, they retained the long-run trend of the KKG series. We have utilized the Balke-Gordon series because we believe that their estimates are the most accurate in terms of annual fluctuations. [1]

**GDP before 1869: shedding light on a statistical dark age**

There are many problems and challenges in estimating GDP before 1869. The issues are clearly laid out in Engerman and Gallman (1983), Davis and Engerman (1999), Gallman (1999) and McCusker (2000). The problems become progressively more difficult the further back in time one pushes the estimation process.

We believe that the most reliable data on GDP before 1869 are contained in Weiss (1992b). Weiss presents both real and nominal estimates of GDP for each census year from 1800 to 1860. He constructed these data in three steps. First, for each census year he directly estimated the value of farm gross product using sources and techniques similar to those employed by Gallman and Kuznets. Second, for each census year he indirectly estimated the value of non-farm gross product by using Sokoloff's (1986) estimates of productivity and productivity growth and his own (1992a) estimates of the non-farm labor force. Third, he added together the farm gross output figures and the non-farm gross output figures to obtain an estimate of GDP.

We utilized Weiss's "broad" concept of GDP; this includes the imputed market value of farm improvements and home manufacturing. Gallman (1999) discusses the importance of including these "unconventional" measures with regard to estimating GDP for the colonial period and his points apply equally well to the period 1789 to 1860. He writes:

"The standard measures of national product include all of agricultural output and the value of shelter; the only other relevant outputs are those that flow through markets. Since, in colonial times, many things now produced exclusively for the market were produced in the home for home consumption, using modern concepts of income and output to construct colonial national accounts would leave much colonial output uncounted. To improve the comparability of colonial and modern measurements, the colonial concept of national product must be modified to include many nonmarketed goods, such as the value of clearing and breaking farm land; slaughtering, butchering, weaving, and dyeing cloth for home consumption; clothes produced in the home for domestic consumption; and the products of hunting and fishing (Gallman 1999: 23)."

We constructed annual estimates for this period by interpolating Weiss's data using annual data from Berry (1978, 1988) and Gallman (contained in Rhode (2002)). Gallman calculated annual GDP for 1834 to 1859 using the same techniques Kuznets applied to 1869 to 1928. We thus used Gallman's annual data whenever possible because he tried to construct as much of his data as possible using direct evidence from the Census and the work of other scholars.

By contrast, Berry's technique was to use various versions of the KKG series and then backcast these data by fitting them to a variety of long-term series. (The series he used are provided in Table 23 of Berry (1978).) This should give pause to those looking to use these data for time series analysis. Berry's annual data are
twenty to thirty percent lower than Weiss through the 1830s. By fitting Weiss's decadal numbers to the Berry data, we have adjusted the later series to what we consider are more comparable levels but we have not been able to improve the short-run properties of the data. (For an effort to do this, see Calomiris and Hanes (1994).)

Finally, the Civil War decade presents a particular challenge. Gallman does not provide any estimates for the period 1860 to 1868. Berry (1988) presents annual data for the decade 1860 to 1870; however, he never says if the Confederacy is included in the data or not. (See his comments.) We interpolated Berry's annual data using the 1860 observation from Weiss (1992b) and the 1869 observation from Gallman (1966). This provides, we believe the best trend for the decade but the short-run properties of the data remain fragile.

References:


Weiss, Thomas. "Estimates of Gross Domestic Product for the United States, 1800 to 1860." Mimeo (University of Kansas) 1992 (b). This work is soon to be published on EH.Net.

http://www.eh.net/hmit/gdp/GDPsource.htm - _ftnref1#_ftnref1