Kuznets (1946) pushed his estimates back to 1869 and forward to 1943. At that point, the task of maintaining and continuing the national accounts was assigned to the Department of Commerce's Office of Business Economics (OBE, later to become the U.S. Bureau of Economic Analysis, BEA). The first report published by the OBE appeared in 1947 with annual estimates going back to 1929. Ever since, the OBE and its successor, the BEA, have been the keepers of the national accounts (Carson 1975). The BEA periodically revises and updates the entire historical record of accounts. The figures reported here reflect the 1996 comprehensive revision (U.S. Bureau of Economic Analysis 1998a, 1998b).

References

See the references at the conclusion of the essay on estimates of national product before 1929, in this chapter.

National Income and Product Accounts: Official Estimates

Richard Sutch

The NIPA Accounts

The national income and product accounts (NIPA) of the United States measure the total value of output produced by the American economy (gross domestic product, or GDP; see Table Ca1–8). Behind this statistical report is a precise double-entry accounting system that is used to keep track of the entire economy and that yields the GDP, a broad measure of the health of the economy, as its bottom line. Even more important, the accounts provide a wealth of underlying detail on the components of GDP so that systematic interrelationships may be investigated and structural features of the economy may be discerned.

The components of GDP are summarized in five basic accounts:

Account 1: National income and product
Account 2: Personal income and outlay
Account 3: Government receipts and expenditures
Account 4: Foreign transactions
Account 5: Gross saving and investment

Each account in the system is presented in Table Ca-D as a traditional T account with sources of funds (credits) recorded on the right-hand side and uses of funds (debits) recorded on the left-hand side. Of course, whether a particular item is a "source" or a "use" of funds is a matter of perspective. For this reason, each of the five accounts takes a different perspective. Each item that appears on the right of one account as a source will appear on the left of another account as a use. The two sides of each account sum to precisely the same total. Table Ca-D presents a simplified view of these five accounts with data for 1996, which is the base year for reporting GDP in constant prices (series Ca6).

Account 1 in Table Ca-D takes the "income approach" to calculating the national product on the left and the "expenditure approach" on the right. The right-hand side of account 1 defines GDP from the perspective of output (also see Tables Ca1–8, Ca20–63, and Ca74–148) and calculates it by assembling data on expenditures. All of the goods and services purchased are allocated into one of the following four broad categories: consumption (line 33), investment (line 37), government purchases (line 47), and net exports to the rest of the world (ROW) (line 44). The production of the goods enumerated on the right-hand side is the source of the incomes distributed on the left-hand side of account 1.

The left-hand side of account 1 totals the incomes earned by the producers of output (also see Tables Ca20–34). These income flows are categorized as labor income (line 1), owners' profits (line 6), rents received (line 7), corporate profits (line 8), and net interest received (line 17). These total to national income (line 18), which does not include depreciation (line 22), indirect taxes (such as sales taxes, line 20), and several other items (lines 19 and 21). To move from the national income concept to the domestic income concept, the net income paid to the ROW must be added (lines 28 and 29). In principle, gross domestic income (GDI) should exactly equal gross domestic product (GDP). However, in practice the match is not exact. The U.S. Bureau of Economic Analysis (BEA) believes that the product side of the account is more accurately measured, so GDP is defined by the expenditure approach. To close the gap between GDI and GDP, a statistical discrepancy, calculated as the difference between GDP and GDI, is added to the left-hand side to balance the account. In recent years the discrepancy has generally been less than 1 percent of GDP.

The double-entry accounting system used in national income accounting recognizes the two-sided nature of every transaction. For each purchase, there is a sale; for each payment, there is a receipt. Unlike business accounting, which takes the perspective of an individual firm, the NIPA are examples of social accounting that assume the perspective of the entire society. Each entry in the accounts has an equal counterentry. Again, take the right-hand side of account 1 as an example. Personal consumption expenditures (line 33) are also entered on the left-hand side of account 2 (line 3), where consumption appears as one of the uses to which personal income is put. In Table Ca-D the counterentries are given in parentheses following the designation of the entry; thus, in account 1 "33 personal consumption expenditures (2-3)" indicates that line 33 of account 1 records personal consumption and that the counterentry can be found in account 2 on line 3.

Account 2 presents the sources of personal income (on the right side) and the uses (or outlays) of that income (on the left). Note that personal saving (line 6) is calculated as a residual by subtracting taxes and personal outlays from personal income. Thus, the two sides of account 2 are in balance by construction.

Account 3 presents the sources of government revenue (on the right side) and government expenditures (on the left). All governments (federal, state, and local) are aggregated together in this simplified version; however, separate accountings at each level of government are available in the original source. In this account the balancing item, which is calculated as a residual, is the "current surplus or deficit" and is entered on the left-hand side. Note that the government surplus here is somewhat different in concept than that presented in government budgets and is distinguished from the latter by the notation "NIPA" in line 10.

Account 4 balances the country's receipts of money from the ROW with payments to the ROW. Thus, U.S. exports (line 1) generate receipts. Payments are made to the ROW in exchange for imports (line 4). In this account net foreign investment (line 10)

TABLE Ca-D Summary of the national income and product accounts: 1996

ACCOUNT 1 – NATIONAL INCOME AND PRODUCT

	National income	
1	Compensation of employees	4,395.6
2	Wage and salary accruals (2-8, 3-8, and 5-6)	3,630.1
3	Supplements to wages and salaries	765.4
4	Employer contributions for social insurance (3-15)	275.4
5	Other labor income (2-9)	490.0
6	Proprietors' income with inventory valuation and capital consumption adjustments (2-10)	544.7
7	Rental income of persons with capital consumption adjustment (2-11)	129.7
8	Corporate profits with inventory valuation and capital consumption adjustments	754.0
9	Corporate profits with inventory valuation adjustment	729.4
10	Profits before tax	726.3
11	Profits tax liability (3-13)	223.6
12	Profits after tax	502.7
13	Dividends (2-12 and 3-6)	297.7
14	Undistributed profits (5-7)	205.0
15	Inventory valuation adjustment (5-7)	3.1
16	Capital consumption adjustment (5-7)	24.6
17	Net interest (2-4, 2-13, and 3-5)	386.3
18	**National Income**	**6,210.4**
19	Business transfer payments (2-14 and 4-9)	34.4
20	Indirect business tax and nontax liability (3-14)	620.0
21	Less: subsidies less current surplus of government enterprises (3-7)	22.6
22	Consumption of fixed capital	956.2
23	Private (5-8)	781.9
24	Government (5-12)	174.3
25	General government	149.2
26	Government enterprises	25.0
27	**Gross National Income**	**7,798.4**
28	Less: income receipts from the rest of the world (4-2)	245.6
29	Plus: income payments to the rest of the world (4-5)	227.5
30	**Gross Domestic Income**	**7,780.3**
31	*Statistical discrepancy (5-19)*	*32.8*
32	**Gross Domestic Product**	**7,813.2**

	National product	
33	Personal consumption expenditures (2-3)	5,237.5
34	Durable goods	616.5
35	Nondurable goods	1,574.1
36	Services	3,047.0
37	Gross private domestic investment (5-1)	1,242.7
38	Fixed investment	1,212.7
39	Nonresidential	899.4
40	Structures	225.0
41	Equipment and software	674.4
42	Residential	313.3
43	Change in private inventories	30.0
44	Net exports of goods and services	−89.0
45	Exports (4-1)	874.2
46	Less: imports (4-4)	963.1
47	Government consumption expenditures and gross investment (3-1 and 5-2)	1,421.9
48	Federal	531.6
49	National defense	357.0
50	Nondefense	174.6
51	State and local	890.4
52	**Gross Domestic Product**	**7,813.2**

ACCOUNT 2 – PERSONAL INCOME AND OUTLAY

	Personal outlays	
1	Personal tax and nontax payments (3-12)	869.7
2	Personal outlays	5,405.6
3	Personal consumption expenditures (1-33)	5,237.5
4	Interest paid by persons (1-17)	149.9
5	Personal transfer payments to the rest of the world (4-7)	18.2
6	*Personal saving (5-5)*	*272.1*
7	**Personal Taxes, Outlays, and Saving**	**6,547.4**

	Personal income	
8	Wage and salary disbursements (1-2)	3,626.5
9	Other labor income (1-5)	490.0
10	Proprietors' income with inventory valuation and capital consumption adjustments (1-6)	544.7
11	Rental income of persons with capital consumption adjustments (1-7)	129.7
12	Personal dividend income (1-13)	297.4
13	Personal interest income (1-17)	810.6
14	Transfer payments to persons (1-19 and 3-3)	928.8
15	Less: personal contributions for social insurance (3-15)	280.4
16	**Personal Income**	**6,547.4**

(continued)

TABLE Ca-D Summary of the national income and product accounts: 1996 *Continued*

ACCOUNT 3 – GOVERNMENT RECEIPTS AND EXPENDITURES

	Government expenditures	
1	Consumption expenditures (1-47)	1,171.8
2	Transfer payments	916.0
3	To persons (2-14)	902.4
4	To the rest of the world (net) (4-8)	13.6
5	Net interest paid (1-17)	274.4
6	Less: Dividends received by government (1-13)	0.3
7	Subsidies less current surplus of government enterprises (1-21)	22.6
8	Less: Wage accruals less disbursements (1-2)	0.0
9	**CURRENT EXPENDITURES**	**2,384.5**
10	*Current surplus or deficit (–), NIPA (5-15)*	*–115.4*
11	**Government Current Expenditures and Surplus**	**2,269.1**

	Government receipts	
12	Personal tax and nontax payments (2-1)	869.7
13	Corporate profits tax liability (1-11)	223.6
14	Indirect business tax and nontax liability (1-20)	620.0
15	Contributions for social insurance (1-4 and 2-15)	555.8
16	**Government Current Receipts**	**2,269.1**

ACCOUNT 4 – FOREIGN TRANSACTIONS

	Receipts from rest of world (ROW)	
1	Exports of goods and services (1-45)	874.2
2	Income receipts from ROW (1-28)	245.6
3	**Receipts from Row**	**1,119.7**

	Payments to rest of world (ROW)	
4	Imports of goods and services (1-46)	963.1
5	Income payments to ROW (1-29)	227.5
6	Transfer payments to ROW (net)	39.8
7	From persons (net) (2-5)	18.2
8	From government (net) (3-4)	13.6
9	From business (1-19)	8.0
10	*Net foreign investment (5-3)*	*–110.7*
11	**Payments to Row**	**1,119.7**

ACCOUNT 5 – GROSS SAVING AND INVESTMENT

	Investment	
1	Gross private domestic investment (1-37)	1,242.7
2	Gross government investment (1-47)	250.1
3	Net foreign investment (4-10)	–110.7
4	**Gross Investment**	**1,382.1**

	Saving	
5	Personal saving (2-6)	272.1
6	Wage accruals less disbursements (private) (1-2)	3.6
7	Undistributed corporate profits with inventory and capital consumption adjustments (1-14, 1-15, and 1-16)	232.7
8	Private consumption of fixed capital (1-23)	782.0
9	Corporate consumption of fixed capital	543.5
10	Noncorporate consumption of fixed capital	238.5
11	**GROSS PRIVATE SAVING**	**1,290.4**
12	Government consumption of fixed capital (1-24)	174.2
13	Federal	85.3
14	State and local	88.9
15	Government current surplus and deficit (–), NIPA (3-10)	–115.4
16	Federal	–136.8
17	State and local	21.4
18	**GROSS GOVERNMENT SAVING**	**58.9**
19	Statistical discrepancy (1-31)	32.8
20	**Gross Saving and Statistical Discrepancy**	**1,382.1**

Source

For the table layout: U.S. Bureau of Economic Analysis (BEA), "A Guide to the NIPAs," in *National Income and Product Accounts, 1929–97* (1998), Table A. For the 1996 data values: BEA Internet site, downloaded August 12, 2003; published August 1, 2003.

Documentation

Items in bold are totals or subtotals. Items in italics in accounts 1 through 4 are calculated as a residual. The line numbers are for cross reference; they are not assigned by the BEA. The numbers in parentheses after some item descriptions indicate the account and line number of the counterentry. For example, "Personal consumption expenditures (2-3)" in account 1, line 33, has its counterentry in account 2, line 3.

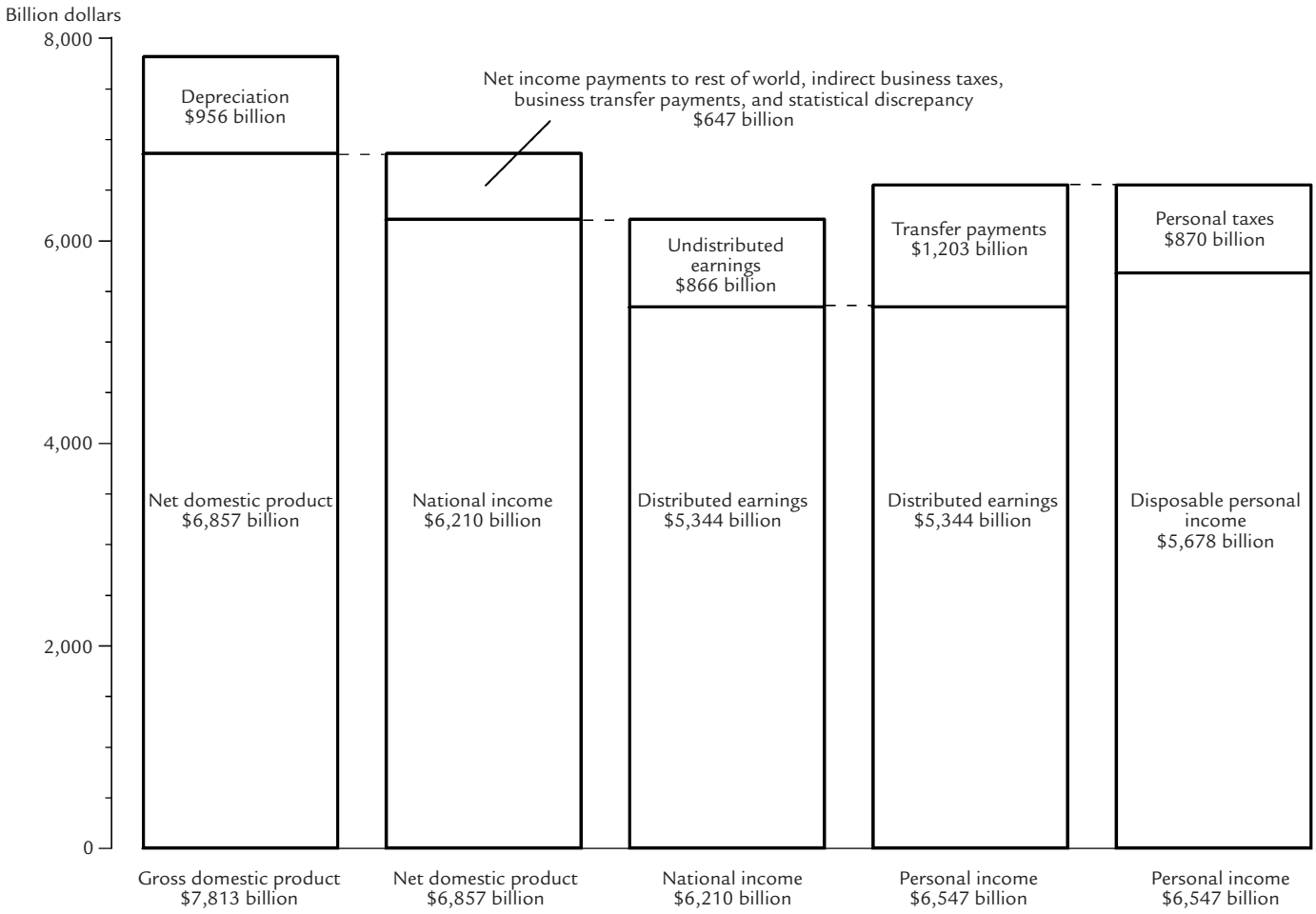

FIGURE Ca-E Relationships among the major NIPA aggregates: 1996

Source
Table Ca-D.

is calculated as a residual. When net foreign investment is positive, it means that Americans, on balance, have invested funds in foreign countries. When it is negative, as was the case in 1996, it means that, on balance, the ROW has invested in the U.S. economy.

Account 5 closes the system by organizing the remaining counterentries as a balance between saving (on the right) and investment (on the left). Note that the investment side records gross investment. Net investment is gross investment (line 4) less the consumption of fixed capital (the sum of lines 8 and 12).

Although the basic structure is summarized in the five accounts, there are other ways of disaggregating GDP. For example, Table Ca135–148 presents GDP based on sector of origin. A full set of the NIPA currently consists of 148 tables. The extent of detail presented in *Historical Statistics* is limited by space requirements; the full set of accounts is available on the BEA's Internet site, where the underlying data are constantly updated and frequently revised. The tables provided here for the period beginning in 1929 present only a hint of the rich detail available in the full accounts.

Greater detail on the account structure can be found in a publication of the BEA, *A Guide to the NIPAs*, which is also available on the BEA Internet site (Seskin and Parker 1998). The basic reference sources for concepts and methodology are "An Introduction to National Income Accounting," "GNP: An Overview of Source Data and Estimating Methods," and "Updated Summary of NIPA Methodologies" (Young and Tice 1985; Carson 1987; U.S. Bureau of Economic Analysis 1998b).

Table Ca1–8 presents several major aggregates, including GDP, national income, and personal income. The relationship among these aggregates is depicted in Figure Ca-E. The difference between GDP and net domestic product is called capital consumption allowances, which is an estimate of the depreciation of the capital stock. The difference between net domestic product and national income is composed of (1) net income payments to the ROW, (2) indirect business tax and nontax liabilities that are chargeable as business expenses (primarily taxes on sales, property, and production, as well as excise taxes, but neither employer contributions to social insurance nor corporate income taxes), (3) business transfer payments to persons and the ROW (less subsidies to business), and (4) the statistical discrepancy discussed earlier. Indirect business taxes are the most significant of these four deductions. National income can be divided into undistributed earnings (consisting of corporate retained earnings, corporate profits tax, employer and employee contributions to social insurance, dividends paid to government, and any excess of wage accruals over disbursements) and distributed earnings. Distributed earnings plus transfer

payments (which include net interest paid by the government and both business and government transfers to persons) constitute personal income. Personal income can be divided into personal taxes and disposable personal income (see Table Ca64–73).

Sources of Data

Most statistical data are collected for purposes other than for use in compiling the national accounts. There is no overarching database from which the NIPA tables are derived. Instead, the BEA relies on a large number of independently designed surveys and data collection protocols. However, it is true that many of these data sources have been shaped in part keeping in mind specific NIPA requirements. Many of the sources are agencies of the government, but private data sources are also used. Even when the source is a government agency, it is often the case that the government must rely on the cooperation of private firms and individuals to supply data and respond to surveys.

This state of affairs means that it is impossible to calculate formal measures of statistical reliability (Fixler and Grimm 2002). The sources used are generally reliable, but many are based on samples rather than a complete census of the economic activity. Users of the national accounts concerned about the accuracies of the measurements of a particular component will need to review the sources of data and the methodologies used by the BEA. Joseph Ritter provides an overview, which would serve as a good starting place (Ritter 2000).

Real versus Nominal National Product

Nominal GDP, calculated using the expenditure approach (the right-hand side of account 1 in Table Ca-D), is valued in terms of current transaction prices. When GDP measured in this way increases from one year to the next, it can be because the country produced more goods and services or because higher prices were paid. Often, the explanation involves a combination of both. If the chief cause of an increase in GDP is an increase in output, it means that the material standard of living has improved. If the primary reason for the change is a general increase in prices, then the cost of living has increased, with a very different implication for the average well-being of residents. It is important to decompose the change in nominal GDP into two components, the portion attributable to changing prices and the portion attributable to a change in production. The change in production is measured by a statistic called real GDP.

The proper accounting methods for calculating real GDP are the subject of a long-sustained dispute, which really has no unique solution. The accepted textbook definition of real GDP is the value of the final goods and services produced during the year when valued at "constant" prices. Typically, a "base year" is chosen to establish these prices, which are then used to evaluate GDP in all other years of interest. The BEA now uses the year 1996 as its base year and presents real GDP estimates (and its components) back to 1929 and forward beyond 1996 in terms of the 1996 prices (series Ca6–8). However, as a practical matter, each item in the GDP is not evaluated at 1996 prices. Given the countless transactions that make up the GDP, this ideal would be impossible to achieve. Furthermore, for some items produced in the years following 1996, there was no "1996 price" for the simple reason that those products were first introduced in a subsequent year. In practice, the BEA uses the "deflation method" for the majority of the components of real GDP. In 1997, 83.6 percent of real GDP was estimated by deflation (Eldridge 1999).

The deflation approach calculates a quantity index by dividing the current dollar estimate by an appropriate price index. In its simplest form, the formula can be written as

$$\text{Real quantity} = \text{Nominal quantity/Price index}$$

The price index is constructed so that it equals 1 in the base year. This formula is not applied for each and every product but is instead applied to commodity groupings and thus sidesteps the problems of new goods. When used by the BEA, the deflation method is applied separately to detailed components of GDP using component estimates of the consumer price index (CPI), the producer price index (PPI), and several other indexes. For an extended discussion of price indexes, see Chapter Cc, on prices. For a discussion of the BEA's use of the deflation method, see the review by Lucy Eldridge (1999).

The traditional way in which the BEA defined real GDP was to total the real expenditures in each of the categories. The result is termed fixed-weight real GDP because the weights are the fixed prices of the base year. With both the fixed-weight real GDP and the nominal current-dollar GDP time series, the BEA then calculated an "implicit price deflator" (IPD) as the ratio of nominal GDP to real GDP.

Although this traditional method is intuitive and makes real GDP easy to interpret as *the value of output had all prices remained at the level of the base year*, it has several weaknesses. The first problem with this approach is that the choice of the base year is to some extent arbitrary, and yet the resulting rates of change of real GDP will depend on the particular base year chosen. If a commodity or service has an unusually low relative price in the base year, that component will receive a lower weight in the calculation of real GDP for all years than in a calculation in which a base year had been chosen in which that component had a relatively high price. The choice of a base year can have a profound effect on calculated growth rates. Take the change in GDP from 1997 to 1998 as an example. When 1995 is chosen as the base year, the growth rate would be calculated as 4.5 percent; using 1990 prices, it would be 6.5 percent (Whalen 2000).

The further back in time the base year is established, the higher will be the rate of growth for real GDP when adjusted by a fixed-weight index. Termed a substitution bias, this phenomenon is a consequence of consumers' tendency to substitute one category of goods for another as relative prices change. As an historical regularity, the economic sectors that had the most rapidly declining relative prices grew the most rapidly in terms of output. A base year further in the past, when prices in the rapidly growing sectors were relatively high, gives those sectors a large fixed weight and thus contributes to an exaggerated measured growth rate for real GDP in years when those sectors are expanding rapidly. Take the computer sector as an example. In 1970, the computer industry was still in its infancy; the sector was small, and prices were quite high. Over the next quarter century, computer prices tumbled, and the output of computers boomed. Using 1970 prices to evaluate the real growth of the sector produces enormous numbers for recent years that swamp the more modest growth rates of many of

the other sectors. Thus, the growth rate of fixed-weight real GDP in 1998 – if measured using 1970 prices, when computers were very expensive – would be an astonishing 37.4 percent (Whalen 2000).

To minimize the effect of substitution bias on recent growth rates, BEA's practice was to move the base year forward periodically. Although this had the desired effect of making the growth estimates more reliable for the recent years, it made them worse for the distant past. Moreover, every time the base year was moved forward, the historical growth rates would change. Although this is awkward for those conducting historical research, the best advice for those using fixed-weight indexes is to choose a base year close to the historical period under study.

In 1996, BEA abandoned its traditional method and adopted the chain-linked method to calculate real GDP (Landefeld and Parker 1995, 1997). To address the problem that the choice of a base year is arbitrary, the new method calculates two price indexes, each with a base in a different but adjacent year, and then averages them. The price change between 1996 and 1997, for example, is calculated using 1996 prices in a fixed-weight index and then is reestimated using 1997 prices. The two estimates are then geometrically averaged (a geometric average is obtained by taking the square root of the product of the two numbers). This average, called a Fisher index, is a rough compromise between the upward substitution bias inherent in the 1996 base-year index and the downward bias that would be present in the index based on 1997 prices (Fisher 1922). The Fisher estimate of the 1996–1997 real change in GDP alleviates much of the problem associated with substitution bias. Annual real changes are calculated in this way for each adjacent pair of years and these are then "chained" together to form a continuous series that passes through the nominal GDP in the year chosen as the base.

Real GDP measured in "chained 1996 dollars" has several desirable properties. The ratio of nominal to real GDP is itself a Fisher index, thus allowing the continued use of this ratio as an implicit deflator for GDP (Table Ca149–158). As each year's output is evaluated at prices appropriate to that year, the chained-price real GDP avoids the need to update the base year routinely and the consequent "rewriting of economic history" whenever the base is changed (Landefeld and Parker 1997, p. 60). The new procedure has also eliminated distortions attributed to using price structures from a recent base year to examine events in the past when relative prices were quite different. The BEA provides a striking example:

> As measured by the old 1987 fixed-weighted index, real GDP dropped 25 percent from 1944 to 1947, reflecting the post–World War II demobilization and the associated sharp cutbacks in defense spending. However, much of this drop reflects the use of 1987 prices for defense equipment. As measured by the more appropriate price weights of BEA's new chain-type indexes, the postwar drop in real GDP is 13 percent. (Landefeld and Parker 1997, p. 60)

There is, however, a major drawback to the use of the new definition for real GDP. The components of real GDP will not sum to the total value. This is because the quantity indexes are forced to pass through the nominal estimates of GDP and its components in the base year (currently 1996). Thus, apart from that year, the 1996-dollar levels are based inconsistently on the annual weights involved in the chained growth rates *and* the quantity weights from the arbitrarily chosen base year. If one adds up the major components of chain-weighted real GDP (consumption, investment, government purchases, and exports minus imports; series Ca85–89) and then subtracts the result from chain-weighted real GDP (series Ca84), a "residual" is obtained (series Ca90). Figure Ca-F graphs this residual as a percent of real GDP.

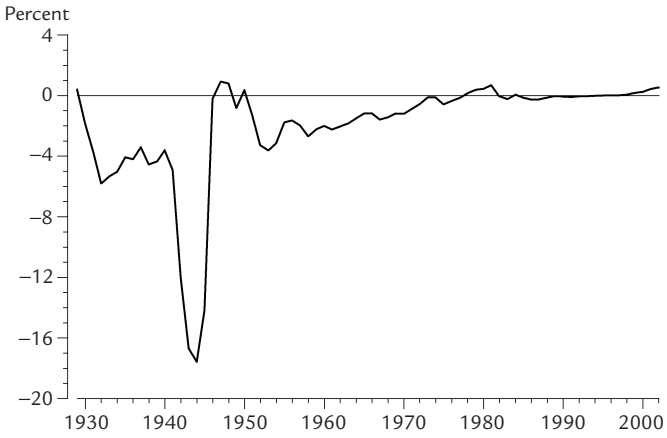

FIGURE Ca-F The residual as a percentage of chain-weighted real GDP: 1929–2002

Source
Series Ca90 as a percentage of series Ca84.

As can be seen, the residual is generally larger the further back in time one looks. Very large residuals are shown for World War II and its immediate aftermath as the component weights from 1996 are strikingly different from those of the wartime economy.

The lack of additivity complicates the use of the chain-weighted components. Specifically, one cannot calculate the "share" of real GDP contributed by a component by using the data on the real components. Shares should be calculated using the nominal estimates of GDP and its components. In general, any calculations that involve ratios, sums, or differences between chain-weighted real series should be avoided. The BEA and Karl Whelan provide useful suggestions for users of the chain-weighted components (Landefeld and Parker 1997; Whalen 2000).

Because of the changing structure of the economy, it is best to use a base year for chained-dollar GDP that is close to the period of interest and to avoid using chained real GDP for studies of long-run trends. The interested user can "rebase" chained real GDP and its major components to an alternative base year by using BEA's "chain-type quantity indexes" (Howell 1997). These are presented in Table Ca159–168. For example, to create real GDP estimates in chained 1952 dollars, we take the current-dollar values of GDP (or one of its major components) from Table Ca74–90. The chain-type quantity indexes for a span of years preceding and following 1952 are then taken from Table Ca159–168. These are used to extrapolate the 1952 current-dollar figures forward and backward. The calculations are illustrated in Table Ca-G. This methodology produces a usable approximation for calculating the shares of each component of real GDP for years close to the new base year, as indicated by the small residuals. BEA publishes a small set of chained real GDP estimates with alternative base years (U.S. Bureau of Economic Analysis 1998a, 1998b). The one for

TABLE Ca-G An illustration of rebasing estimates of real gross domestic product and its components

	Year	Gross domestic product	Personal consumption expenditures	Gross private domestic investment	Exports of goods and services	Imports of goods and services	Government consumption expenditures and gross investment	Residual
Chain-type quantity indexes (1996 = 100)	1948	19.97	19.06	17.33	6.84	5.65	23.13	—
	1949	19.85	19.58	13.22	6.78	5.45	25.83	—
	1950	21.59	20.83	18.71	5.93	6.44	25.84	—
	1951	23.23	21.14	18.77	7.27	6.69	35.16	—
	1952	24.16	21.81	16.99	6.93	7.28	42.56	—
	1953	25.26	22.86	17.78	6.47	7.97	45.54	—
	1954	25.09	23.33	16.96	6.78	7.57	42.40	—
	1955	26.87	25.02	21.09	7.50	8.49	40.82	—
	1956	27.40	25.75	20.81	8.75	9.17	40.85	—
GDP in chained 1952 dollars	1948	296.4	192.0	55.1	16.1	11.9	45.6	−0.5
	1949	294.6	197.2	42.0	15.9	11.5	50.9	0.0
	1950	320.5	209.8	59.5	13.9	13.5	50.9	−0.2
	1951	344.8	213.0	59.7	17.1	14.1	69.3	−0.2
	1952	358.6	219.7	54.0	16.3	15.3	83.9	0.0
	1953	374.9	230.3	56.5	15.2	16.8	89.8	−0.1
	1954	372.4	235.0	53.9	15.9	15.9	83.6	−0.1
	1955	398.8	252.0	67.0	17.6	17.8	80.5	−0.5
	1956	406.7	259.4	66.1	20.6	19.3	80.5	−0.7

Sources

Chain-type quantity indexes: Table Ca159–168. Gross domestic product (GDP) and its major components for 1952: Table Ca74–90.

Documentation

The chain-type quantity indexes in the top panel are used to extrapolate the 1952 data forward and backward. For example, GDP in chained 1952 dollars can be computed as follows:

For years before the base year: $GDP_t = GDP_{t+1} * (I_t/I_{t+1})$

$GDP_{1951} = GDP_{1952} * (I_{1951}/I_{1952})$

$344.8 = 358.6 * (23.23/24.16)$

For years after the base year: $GDP_t = GDP_{t-1} * (I_t/I_{t-1})$

$GDP_{1953} = GDP_{1952} * (I_{1953}/I_{1952})$

$374.9 = 358.6 * (25.26/24.16)$

1929–1947 uses 1937 dollars; for 1942–1962 the base is 1952 dollars, and so on.

References

See the references at the conclusion of the essay on estimates of national product before 1929, in this chapter.

Estimates of National Product before 1929

Paul W. Rhode and Richard Sutch

The official estimates of national income and product provided by the Bureau of Economic Analysis (BEA) begin in 1929. The broad interest in long-term trends has generated a number of attempts to estimate national product for the earlier period. We briefly summarize this work, concentrating on annual estimates of real national output suitable for estimating economic and productivity growth. One product of this effort is a new annual series on real per capita gross product for 1790–2000 (Table Ca9–19).

Although estimates of aggregate output for the nineteenth and early twentieth centuries are undoubtedly valuable for the study of economic growth, the increase in the average standard of living, and other long-run trends, a concern arises because aggregate measures of output presented as annual time series are also used to study fluctuations in economic activity. However, the standards of precision in the estimates of national output required for examination of short-run changes, study of business cycles, or analysis of macroeconomic dynamics are much higher than those required to assess the pace and pattern of long-term economic growth. In Chapter Cb, data on economic fluctuations are described in detail. This chapter deals with estimates of national product that are intended primarily to focus on trends rather than fluctuations.

It is important to note that all pre-1929 estimates are based on fragmentary data that were not originally collected for the purpose of making national product estimates. This means that the series are less precise than the official estimates. Moreover, the further back in time these estimating methods are pushed, the more degraded the quality of existing data and the more scarce reliable detailed series become. These problems force the investigator to fill the gaps with interpolated data, rough estimates, and conjectured relationships between available and missing data. Finally, most experts in the field regard all of the available annual estimates of gross product before 1909 as unfinished "work in progress." Simon Kuznets, John Kendrick, and Robert Gallman, whose work on pre-1929 gross national product (GNP) is the foundation for all existing estimates, did not publish their annual series for the early period (Kuznets 1946, 1961; Kendrick 1961; Gallman 1966). They were interested in long-run trends and the factors underlying economic growth, not in annual economic fluctuations. Their annual estimates were not intended to accurately measure the timing and magnitude of recessions and depressions. At the time of his death in 1998, Gallman still regarded his annual series as subject to revision (Rhode 2002).