

A Guide to the NIPA's

IN this two-volume publication, the Bureau of Economic Analysis presents revised estimates of the national income and product accounts (NIPA's) for 1929–97 that reflect the most recent comprehensive revision of the NIPA's and the 2000 annual NIPA revision.¹ Estimates for 1998 forward that reflect the 2001 annual revision released in July 2001 are available in the *SURVEY OF CURRENT BUSINESS* and on BEA's Web site.²

The 1999 comprehensive revision was the 11th of its kind since the Department of Commerce first published national income statistics in 1934. Comprehensive revisions differ from annual NIPA revisions because of the scope of the changes and because of the number of years subject to revision. Comprehensive revisions incorporate three major types of improvements: (1) Definitional and classificational changes that update the accounts to more accurately portray the evolving U.S. economy, (2) statistical changes that update the accounts to reflect the introduction of new and improved methodologies and the incorporation of newly available and revised source data, and (3) presentational changes that update the NIPA tables to reflect the definitional, classificational, and statistical changes and to make the tables more informative.

The first section of this publication presents background information and a brief history of the NIPA's. The second section describes the definitions and classifications underlying the NIPA's. The third section discusses the presentation of

the NIPA's, and the fourth section discusses the statistical conventions used for the NIPA estimates. An appendix lists the principal source data and methods used to prepare the estimates of gross domestic product (GDP). The remainder of the publication presents 147 NIPA tables.³

History of the NIPA's

The estimation of national income was initiated during the early 1930's, when the lack of comprehensive economic data frustrated efforts of Presidents Hoover and Roosevelt to design policies to combat the Great Depression. In response to this need, the Department of Commerce commissioned Simon Kuznets of the National Bureau of Economic Research (NBER) to develop estimates of national income. Professor Kuznets headed a small group within the Bureau of Foreign and Domestic Commerce's Division of Economic Research. Professor Kuznets coordinated the work of researchers at the NBER in New York and his staff at Commerce. The estimates were presented in a report to the Senate in 1934, *National Income, 1929–32*.

The entry of the United States into World War II led to increased demand for data that could be used for wartime planning. Early in 1942, annual estimates of gross national product (GNP) were introduced to complement the estimates of national income. In addition, estimates were developed for how income was generated, received, and spent by the various sectors of the economy.

The U.S. national income and product statistics were first presented as part of a complete and consistent accounting system in the July 1947 supplement to the *SURVEY OF CURRENT BUSINESS*. The supplement contained 48 tables covering the

1. For specific information about NIPA comprehensive and annual revisions, see the *SURVEY OF CURRENT BUSINESS* articles in the box on page M-4. The results of the comprehensive revision, including revised estimates of fixed assets and consumer durable goods, were published in the *SURVEY* and on BEA's Web site <www.bea.doc.gov> from October 1999 to April 2000, and the results of the 2000 annual revision were released in July 2000.

2. These estimates incorporate the statistical, methodological, and presentational improvements that were introduced in this revision; see "Annual Revision of the National Income and Product Accounts," *SURVEY* 81 (August 2001): 7–32.

3. The full set of NIPA tables now consists of 148 tables, reflecting the addition of table 8.30, "Contributions to Percent Change in the Gross Domestic Purchases Price Index," in the 2001 annual revision. See the section "Publication of the NIPA tables."

years 1929–46. All estimates were presented in current dollars; no adjustments were yet made for changes in purchasing power. Quarterly estimates were available for only a few of the aggregates (national income, GNP, and personal income, and their major components). Monthly estimates were presented for personal income and its major components.

In 1951, annual estimates of real GNP and of implicit price deflators were introduced as supplementary tables. Real GNP was calculated by holding fixed the prices of a particular base year—that is, GNP was calculated in “constant dollars.” In 1954, these inflation-adjusted estimates were formally integrated into the standard NIPA tables.

Another revision, published in 1958, introduced changes in the accounting system and added new information to the accounts. The five summary accounts were adopted as a concise, general presentation of output, income, outlays, foreign transactions, saving, and investment. Quarterly estimates of real GNP were introduced. Government sector tables provided a new breakdown of expenditures by type and function for the Federal Government and for State and local governments. The foreign transactions tables were expanded in detail and integrated with the balance of payments accounts. Regional estimates were introduced, as were estimates of the net stock of fixed assets in manufacturing.

In the 1965 comprehensive revision, for the first time, the components of GNP were benchmarked to the detailed estimates contained in the 1958 input-output table, which provided a better understanding of the structural relationships within the economy.

During the 1960’s and 1970’s, the estimates of capital stock were expanded to cover all business and government-owned fixed assets and consumer durable goods. In 1976, in order to provide a more consistent valuation, the estimates of consumption of fixed capital (CFC) were shifted to a current-cost basis from a book-value basis valued at historical cost, which had reflected a mixture of prices for the various years in which the assets were acquired.

In 1985, BEA introduced quality-adjusted price indexes for computers and peripheral

equipment that were developed with the assistance and advice of the IBM Corporation. The indexes, which were based on a statistical technique known as “hedonic” regression, adjusted for the rapid improvements in speed and capacity of computer equipment. These hedonic price indexes provide improved measures of price change for computers and peripheral equipment during periods when quality characteristics change rapidly and when prices decline as new products are introduced.

In 1991, BEA changed its featured measure of U.S. production from GNP to GDP. GDP covers the goods and services produced by labor and property located in the United States, and thus, it is consistent with key economic indicators of employment, productivity, and industry output. The change also facilitated comparisons of economic activity in the United States with that in other countries.

In 1996, BEA introduced several major improvements to the NIPA’s. BEA began estimating the changes in real GDP and its components by chaining together year-by-year quantity changes that were calculated using the Fisher index formula, rather than estimating real GDP on the basis of prices of a single, arbitrary base year.⁴ Government expenditures for equipment and structures were recognized as fixed investment, thereby providing a more complete measure of investment through the consistent treatment of fixed assets whether purchased by the public or the private sector. The method for calculating CFC was changed to reflect the results of studies on the prices of used equipment and structures in resale markets that found that depreciation generally tends to follow a geometric pattern.

The most recent comprehensive revision of the NIPA’s, which was released beginning in 1999, further improved the definitions underlying the accounts and the statistical underpinnings of the current-dollar estimates, quantities, and prices in the accounts. For example, business and government expenditures for software were recognized as fixed investment. Government employee re-

4. The chain-type measures of real output and prices eliminate the overstatement of real GDP growth for periods after the reference year and the understatement of real GDP growth for periods before the reference year.

tirement plans were reclassified so that they would be treated similarly to private pension plans. A new method was introduced for calculating the real value of unpriced bank services by incorporating measures of banking activity. The consumer price indexes that were used for deflating personal consumption expenditures (PCE) were revised back to 1978 to reflect the use of a geometric-mean formula.

The improvements introduced over the years have reflected not only BEA's own experience, research, and strategic planning but also the reviews and recommendations of scholars and other experts.

In the 1950's, there were two major reviews of the accounts. The first was prepared by the NBER.⁵ The second resulted from a symposium on the accounts held by the Conference on Research in Income and Wealth.⁶ Both of these reviews dealt with emerging issues of the time, many of which related to expanding the complexity and scope of the accounts to more accurately portray the U.S. economy. They also dealt with conceptual issues, such as the treatment of capital gains and the coverage of nonmarket production and consumption, and they discussed the need for better integration of the income and product accounts, flow of funds, and other aspects of the existing accounts.

In 1971, on the occasion of the 50th anniversary of the SURVEY, BEA published a special volume containing 43 papers contributed by some of the country's most prominent economists.⁷ BEA catalogued and prioritized the suggestions from these papers, and BEA's Director at that time, George Jaszi, responded to them.

In 1977, a report was prepared by the Advisory Committee on Gross National Product Data Improvement (referred to as the Creamer Report af-

ter its chair, Daniel Creamer).⁸ The report addressed concerns about the relatively large revisions to the GNP estimates in the early 1970's and focused on needed improvements in the source data.

In 1979, the Conference on Research in Income and Wealth addressed several aspects of the NIPA's role as a system of information about the behavior of the economy.⁹ Topics included the concepts and structure of the accounts, deflation and the treatment of quality change in price indexes, and source data. The last topic included an evaluation of major parts of the Creamer Report.

In 1982, the General Accounting Office published a report that reviewed quarterly GNP revisions in order to reevaluate the relative importance of the Creamer report's recommendations and to reassess the reliability of the GNP estimates.¹⁰ The report focused more on statistical than on conceptual issues and suggested that priorities be placed on those recommendations that would most reduce GNP revisions. In addition, as the title indicates, it urged BEA to take a more proactive role in obtaining the source data needed to improve the accounts.

In 1995, BEA began a comprehensive review of its national, international, and regional economic accounts. Outside perspective was obtained by comments and discussions of a strategic plan that BEA presented in the SURVEY and at a conference of users.¹¹

In 2000, BEA established an advisory committee that meets about twice a year to discuss issues and possible improvements to the accounts. The papers that are presented to the advisory committee are available on BEA's Web site at <www.bea.doc.gov>.

5. U.S. Congress, Joint Economic Committee, Subcommittee on Economic Statistics, "The National Economic Accounts of the United States: Review, Appraisal, and Recommendations," in *The National Economic Accounts of the United States*, report by the National Accounts Review Committee, National Bureau of Economic Research, 85th Congress (October 1957).

6. *A Critique of the United States Income and Product Accounts*, Studies in Income and Wealth, vol. 22 (Princeton, NJ: Princeton University Press, for the National Bureau of Economic Research, 1958).

7. "The Economic Accounts of the United States: Retrospect and Prospect," SURVEY 51, Part II (July 1971).

8. Office of Federal Statistical Policy and Standards, *Gross National Product Data Improvement Project Report*, report of the Advisory Committee on Gross National Product Data Improvement (Washington, DC: U.S. Department of Commerce, 1977).

9. Murray F. Foss, ed., *The U.S. National Income and Product Accounts: Selected Topics*, Studies in Income and Wealth, vol. 47 (Chicago: University of Chicago Press, for the National Bureau of Economic Research, 1983).

10. Comptroller General, *The Bureau of Economic Analysis Should Lead Efforts to Improve GNP Estimates* (Washington, DC: General Accounting Office, 1982).

11. "Mid-Decade Strategic Review of BEA's Economic Accounts: Maintaining and Improving Their Performance," SURVEY 75 (February 1995): 36–66, and "Mid-Decade Strategic Review of BEA's Economic Accounts: An Update," SURVEY 75 (April 1995): 48–56.

Additional Information About the National Accounts

The Bureau of Economic Analysis (BEA) has published a wealth of information about the methodologies that are used to prepare its national accounts. This information is available on the Web site at <www.bea.doc.gov>.

The national accounts encompass the detailed estimates in the national income and product accounts (including gross domestic product), the estimates of wealth and related estimates, gross product by industry, and the input-output accounts.

National income and product accounts (NIPA's).

This series of papers documents the conceptual framework of the NIPA's and the methodologies that have been used to prepare the estimates.

An Introduction to National Economic Accounting (1985) [also in the March 1985 SURVEY]

Corporate Profits: Profits Before Tax, Profits Tax Liability, and Dividends (1985) [A revised version is forthcoming.]

Foreign Transactions (1987)

GNP: An Overview of Source Data and Estimating Methods (1987) [Most of the information in this paper has been superseded by this publication.]

Government Transactions (1988)

Personal Consumption Expenditures (1990)

These methodologies have been updated and improved, typically as part of the comprehensive and annual revisions of the NIPA's. The most recent revisions are described in the following articles from the SURVEY OF CURRENT BUSINESS.

“A Preview of the 1999 Comprehensive Revision of the National Income and Product Accounts”
Definitional and Classificational Changes
(August 1999)

New and Redesigned Tables (September 1999)
Statistical Changes (October 1999)

“Improved Estimates of the National Income and Product Accounts: Results of the Comprehensive Revision”

For 1959–98 (December 1999)

For 1929–99 (April 2000)

“Annual Revision of the U.S. National Income and Product Accounts” (August 2000 and 2001)

Information about the sources and methods that are used to prepare the national estimates of personal

income, which are the basis for the State estimates, is in *State Personal Income, 1929–97* (1999).

“BEA's Chain Indexes, Time Series, and Measures of Long-Term Economic Growth” (May 1997) is the most recent in a series of articles that describe the conceptual basis for the chain-type measures of real output and prices that are used in the NIPA's.

“Reliability of the Quarterly and Annual Estimates of GDP and Gross Domestic Income” (December 1998) evaluates these estimates by examining the record of revisions to them.

The NIPA's also incorporate information on transactions with foreign residents from BEA's international transactions accounts (ITA's). The methodologies used to prepare the estimates in these accounts are described in *The Balance of Payments of the United States: Concepts, Data Sources, and Estimating Procedures* (1990). These methodologies have been updated and improved as part of the annual revisions of the ITA's; the latest article—“U.S. International Transactions: Revised Estimates for 1989–2000”—was published in the July 2001 SURVEY.

Wealth and related estimates. *Fixed Reproducible Tangible Wealth in the United States, 1925–94* (1999) discusses the concepts and statistical considerations that underlie the estimates and their derivation.

For the most recent estimates, see “Fixed Assets and Consumer Durable Goods for 1925–2000” (September 2001).

Gross product by industry. “Improved Estimates of Gross Product by Industry for 1947–98” (June 2000) describes the most recent comprehensive revision of these estimates.

“Gross Domestic Product by Industry for 1997–99” (December 2000) describes the most recent annual revision of these estimates.

Input-output accounts. “Benchmark Input-Output Accounts for the U.S. Economy, 1992” (November 1997) describes the preparation of the 1992 accounts and the concepts and methods that underlie the accounts.

“Annual Input-Output Accounts of the U.S. Economy” updates the 1992 benchmark accounts

For 1996 (January 2000)

For 1997 (January 2001)

Definitions and Classifications Underlying the NIPA's

NIPA Entries

The major components of the NIPA's are presented and defined below within the context of the five Summary National Income and Product Accounts (see [table A](#) on pages M-6 and M-7). The five summary accounts show the composition of production and the distribution of the incomes earned in production. The first account is the National Income and Product Account: The right side shows GDP as measured by the sum of goods and services produced in the United States and sold to final users, and the left side shows GDP as measured by the incomes earned in production—gross domestic income (GDI)—plus the “statistical discrepancy” between the two measures.¹² Each of the components in this summary account can be mapped to one of the other summary accounts and can, in turn, be mapped to one or more of the 148 tables that now make up the full set of NIPA tables. This system of integrated, double-entry accounts provides a comprehensive and unduplicated measure of economic activity within a consistently defined framework.¹³ Thus, the NIPA's, in combination with BEA's industry, wealth, and regional accounts, can be used to trace the principal economic flows among the major sectors of the economy.

Within the summary accounts, each entry has a counterentry, generally in another account. The parenthetical numbers that follow an entry in table A identify the counterentry by account and line number. With the exception of major income and product aggregates, entries are usually defined in the sequence in which they appear in the five-account summary. The definition is not repeated where the counterentry appears, but a cross-reference is made to the place of its first appearance. After the five-account-summary discussion, definitions for the following items are presented: Final sales of domestic product, gross domestic purchases, final sales to domestic purchasers, fixed as-

sets, produced assets, nonproduced assets, population, personal saving as a percentage of disposable personal income, gross saving as a percentage of gross national product, U.S. residents, foreign residents, and the rest of the world.

Major aggregates

Gross domestic product (GDP), the featured measure of U.S. output, is the market value of the goods and services *produced by labor and property located in the United States*.¹⁴ Because the labor and property are located in the United States, the suppliers (that is, the workers and, for property, the owners) may be either U.S. residents or residents of the rest of the world.

Gross domestic income (GDI) (1-34) measures output as the costs incurred and the incomes earned in the production of GDP.¹⁵ As noted above, in theory, GDP should equal GDI, but in practice, they differ because their components are estimated using largely independent and less-than-perfect source data. This difference is termed the “statistical discrepancy” (described below).

Gross national product (GNP) is the market value of the goods and services *produced by labor and property supplied by U.S. residents*. Because the labor and property are supplied by U.S. residents (see the definition on page M-14), they may be located either in the United States or abroad. The difference between GDP and GNP is net receipts of income from the rest of the world. These net receipts represent income from the goods and services produced abroad using labor and property supplied by U.S. residents less payments to the rest of the world for the goods and services produced in the United States using labor and property supplied by foreign residents. The income receipts and payments are measured as compensation of employees, corporate profits (earnings of both incorporated

12. In theory, GDP should equal GDI, but in practice, they differ because their components are estimated using largely independent and less-than-perfect source data; this difference is the “statistical discrepancy.”

13. For more information on the concepts underlying the accounts, see Allan H. Young and Helen Stone Tice, *An Introduction to National Economic Accounting*, Methodology Paper No. 1 (Washington, DC: U.S. Government Printing Office, 1985); go to <www.bea.doc.gov>, and look under Methodologies.

14. In the NIPA's, the United States consists of the 50 States (before 1960, Alaska and Hawaii were not included), the District of Columbia, and U.S. military installations, embassies, and consulates abroad.

15. Capital gains and losses are not included in NIPA measures, because they result from the revaluation and sale of existing assets rather than from current production.

Table A.—Summary National Income and Product Accounts, 1997

[Billions of dollars]

Account 1.—National Income and Product Account

Line			Line		
1	Compensation of employees	4,651.3	36	Personal consumption expenditures (2-3)	5,529.3
2	Wage and salary accruals	3,886.0	37	Durable goods	642.5
3	Disbursements (2-7)	3,888.9	38	Nondurable goods	1,641.6
4	Wage accruals less disbursements (3-8 and 5-5)	-2.9	39	Services	3,245.2
5	Supplements to wages and salaries	765.3	40	Gross private domestic investment (5-1)	1,390.5
6	Employer contributions for social insurance (3-16)	289.9	41	Fixed investment	1,327.7
7	Other labor income (2-8)	475.4	42	Nonresidential	999.4
8	Proprietors' income with inventory valuation and capital consumption adjustments (2-9)	581.2	43	Structures	255.8
9	Rental income of persons with capital consumption adjustment (2-10)	128.3	44	Equipment and software	743.6
10	Corporate profits with inventory valuation and capital consumption adjustments	833.8	45	Residential	328.2
11	Corporate profits with inventory valuation adjustment	800.8	46	Change in private inventories	62.9
12	Profits before tax	792.4	47	Net exports of goods and services	-89.3
13	Profits tax liability (3-13)	237.2	48	Exports (4-1)	966.4
14	Profits after tax	555.2	49	Imports (4-3)	1,055.8
15	Dividends (2-12)	335.2	50	Government consumption expenditures and gross investment (3-1 and 5-2)	1,487.9
16	Undistributed profits	220.0	51	Federal	538.2
17	Inventory valuation adjustment	8.4	52	National defense	352.6
18	Capital consumption adjustment	32.9	53	Nondefense	185.6
19	Net interest (2-15)	423.9	54	State and local	949.7
20	National income	6,618.4			
21	Business transfer payments	36.8			
22	To persons (2-19)	27.9			
23	To the rest of the world (4-8)	8.9			
24	Indirect business tax and nontax liability (3-14)	646.2			
25	Less: Subsidies less current surplus of government enterprises (3-7)	19.1			
26	Consumption of fixed capital (5-7)	1,013.3			
27	Private (5-8)	832.4			
28	Government (5-9)	180.9			
29	General government (5-10)	154.6			
30	Government enterprises (5-11)	26.3			
31	Gross national income	8,295.7			
32	Less: Income receipts from the rest of the world (4-2)	281.3			
33	Plus: Income payments to the rest of the world (4-4)	274.2			
34	Gross domestic income	8,288.6			
35	Statistical discrepancy (5-13)	29.7			
	GROSS DOMESTIC PRODUCT	8,318.4		GROSS DOMESTIC PRODUCT	8,318.4

Account 2.—Personal Income and Outlay Account

Line			Line		
1	Personal tax and nontax payments (3-12)	968.8	7	Wage and salary disbursements (1-3)	3,888.9
2	Personal outlays	5,715.3	8	Other labor income (1-7)	475.4
3	Personal consumption expenditures (1-36)	5,529.3	9	Proprietors' income with inventory valuation and capital consumption adjustments (1-8)	581.2
4	Interest paid by persons (2-17)	164.8	10	Rental income of persons with capital consumption adjustment (1-9)	128.3
5	Personal transfer payments to the rest of the world (net) (4-6)	21.2	11	Personal dividend income	334.9
6	Personal saving (5-4)	252.9	12	Dividends (1-15)	335.2
			13	Less: Dividends received by government (3-6)3
			14	Personal interest income	864.0
			15	Net interest (1-19)	423.9
			16	Net interest paid by government (3-5)	275.3
			17	Interest paid by persons (2-4)	164.8
			18	Transfer payments to persons	962.2
			19	From business (1-22)	27.9
			20	From government (3-3)	934.4
			21	Less: Personal contributions for social insurance (3-17)	297.9
	PERSONAL TAXES, OUTLAYS, AND SAVING	6,937.0		PERSONAL INCOME	6,937.0

NATIONAL INCOME AND PRODUCT ACCOUNTS OF THE UNITED STATES, 1929-97

Table A.—Summary National Income and Product Accounts, 1997—Continued

[Billions of dollars]

Account 3.—Government Receipts and Expenditures Account

Line			Line		
1	Consumption expenditures (1-50)	1,223.3	12	Personal tax and nontax payments (2-1)	968.8
2	Transfer payments	945.0	13	Corporate profits tax liability (1-13)	237.2
3	To persons (2-20)	934.4	14	Indirect business tax and nontax liability (1-24)	646.2
4	To the rest of the world (net) (4-7)	10.6	15	Contributions for social insurance	587.8
5	Net interest paid (2-16)	275.3	16	Employer (1-6)	289.9
6	Less: Dividends received by government (2-13)3	17	Personal (2-21)	297.9
7	Subsidies less current surplus of government enterprises (1-25)	19.1			
8	Less: Wage accruals less disbursements (1-4)	0			
9	Current surplus or deficit (-), national income and product accounts				
	(5-12)	-22.3			
10	Federal	-53.3			
11	State and local	31.0			
	GOVERNMENT CURRENT EXPENDITURES AND SURPLUS	2,440.0		GOVERNMENT CURRENT RECEIPTS	2,440.0

Account 4.—Foreign Transactions Account

Line			Line		
1	Exports of goods and services (1-48)	966.4	3	Imports of goods and services (1-49)	1,055.8
2	Income receipts (1-32)	281.3	4	Income payments (1-33)	274.2
			5	Transfer payments to the rest of the world (net)	40.8
			6	From persons (net) (2-5)	21.2
			7	From government (net) (3-4)	10.6
			8	From business (1-23)	8.9
			9	Net foreign investment (5-3)	-123.1
	RECEIPTS FROM THE REST OF THE WORLD	1,247.7		PAYMENTS TO THE REST OF THE WORLD	1,247.7

Account 5.—Gross Saving and Investment Account

Line			Line		
1	Gross private domestic investment (1-40)	1,390.5	4	Personal saving (2-6)	252.9
2	Gross government investment (1-50)	264.6	5	Wage accruals less disbursements (private) (1-4)	-2.9
3	Net foreign investment (4-9)	-123.1	6	Undistributed corporate profits with inventory valuation and capital consumption adjustments	261.3
			7	Consumption of fixed capital (1-26)	1,013.3
			8	Private (1-27)	832.4
			9	Government (1-28)	180.9
			10	General government (1-29)	154.6
			11	Government enterprises (1-30)	26.3
			12	Government current surplus or deficit (-), national income and product accounts (3-9)	-22.3
			13	Statistical discrepancy (1-35)	29.7
	GROSS INVESTMENT	1,532.1		GROSS SAVING AND STATISTICAL DISCREPANCY	1,532.1

NOTE.—Numbers in parentheses indicate accounts and items of counterentry in the accounts. For example, line 7 of account 1 is shown as "other labor income (2-8)"; the counterentry is shown in account 2, line 8.

and unincorporated affiliates), and interest.

Gross national income (GNI) (1-31) is the costs incurred and the incomes earned in the production of GNP. GNI is the sum of (1) factor incomes—compensation of employees, proprietors' income with inventory valuation adjustment (IVA) and capital consumption adjustment (CCAdj), rental income of persons with CCAdj, corporate profits with IVA and CCAdj,

and net interest; (2) three nonfactor charges—business transfer payments, indirect business tax and nontax liability, and the current surplus of government enterprises less government subsidy payments; and (3) consumption of fixed capital (CFC). GNI and GNP also differ by the statistical discrepancy.

Net domestic product (NDP) is the net market value of the goods and services attributable to labor and

property located in the United States and is equal to GDP less CFC. NDP may be viewed as an estimate of sustainable product, which is a rough measure of the level of consumption that can be maintained while leaving capital assets intact.

Net national product (NNP) is the net market value of goods and services attributable to the labor and property supplied by U.S. residents and is equal to GNP less CFC. The measure of CFC used for both NDP and NNP relates only to fixed capital located in the United States. The investment in capital is measured by private fixed investment and government gross investment.

National income (1–20) is the sum of the factor incomes. It is a net factor-cost measure (net of CFC) equal to the income that originates in the production of goods and services from labor and property supplied by U.S. residents.

Domestic income, also a net factor-cost measure, is the income that originates in the production of goods and services attributable to labor and property located in the United States.

Personal income is the income received by persons from all sources—that is, from participation in production, from both government and business transfer payments, and from government interest (which is treated like a transfer payment). “Persons” consists of individuals, nonprofit institutions that primarily serve individuals, private noninsured welfare funds, and private trust funds. Personal income is calculated as the sum of wage and salary disbursements, other labor income, proprietors’ income with IVA and CCAdj, rental income of persons with CCAdj, personal dividend income, personal interest income, and transfer payments to persons, less personal contributions for social insurance.

Disposable personal income is personal income less personal tax and nontax payments. It is the income available to persons for spending or saving.

National income and product account

GDP is measured as the sum of personal consumption expenditures, gross private domestic investment (including change in private inventories and before deduction of charges for CFC), net exports of goods and services (exports less imports), and government consumption expenditures and gross investment. GDP excludes intermediate purchases of goods and services by business.

Personal consumption expenditures (PCE) (1–36) is

goods and services purchased by U.S. residents. PCE consists mainly of purchases of new goods and of services by individuals from private business. In addition, PCE includes purchases of new goods and of services by nonprofit institutions (including compensation of employees), net purchases of used goods by individuals and nonprofit institutions, and purchases abroad of goods and services by U.S. residents. PCE also includes purchases of certain goods and services provided by general government and government enterprises, such as tuition payments for higher education, charges for medical care, and charges for water and other sanitary services. Finally, PCE includes imputed purchases that keep PCE invariant to changes in the way that certain activities are carried out—for example, whether housing is rented or owned, whether financial services are explicitly charged, or whether employees are paid in cash or in kind.

The following conventions are used to classify each PCE commodity: *Durable goods* (1–37) are tangible commodities that can be stored or inventoried and that have an average life of at least 3 years; *nondurable goods* (1–38) are all other tangible commodities that can be stored or inventoried; and *services* (1–39) are commodities that cannot be stored and that are consumed at the place and time of purchase.

Gross private domestic investment (1–40) consists of *fixed investment* (1–41) and *change in private inventories* (1–46). Fixed investment consists of both *nonresidential* (1–42) fixed investment and *residential* (1–45) fixed investment. It is measured without a deduction for CFC and includes replacements and additions to the capital stock. It covers all investment in fixed assets by private businesses and by nonprofit institutions in the United States, regardless of whether the fixed asset is owned by U.S. residents. (Purchases of the same types of equipment, software, and structures by government agencies are included in government gross investment.) It excludes investment by U.S. residents in other countries. Nonresidential fixed investment consists of both *structures* (1–43) and *equipment and software* (1–44).

Nonresidential structures consists of new construction (including own-account production), improvements to existing structures, expenditures on new nonresidential mobile structures, brokers’ commissions on sales of structures, and net purchases of used structures by private business and by nonprofit institutions from government agencies.¹⁶ New construction includes hotels and motels and mining exploration,

shafts, and wells. Nonresidential structures also includes equipment considered to be an integral part of a structure, such as plumbing, heating, and electrical systems.

Equipment and software consists of purchases by private business and by nonprofit institutions on capital account of new machinery, equipment, furniture, vehicles, and computer software; dealers' margins on sales of used equipment to business and to nonprofit institutions; and net purchases of used equipment from government agencies, from persons, and from the rest of the world. Own-account production of computer software is also included. For equipment that is purchased for both business and personal use (for example, motor vehicles), the personal-use portion is included in PCE.

Residential fixed investment consists of all private residential structures and of residential equipment that is owned by landlords and rented to tenants. Residential structures consists of new construction of permanent-site single-family and multifamily units, improvements (additions, alterations, and major structural replacements) to housing units, expenditures on manufactured homes, brokers' commissions on the sale of residential property, and net purchases of used structures from government agencies. Residential structures includes some types of equipment that are built into the structure, such as heating and air-conditioning equipment.

Change in private inventories (1–46) is the change in the physical volume of inventories owned by private business, valued in average prices of the period. It differs from the change in the book value of inventories reported by most business; the difference is the *inventory valuation adjustment* (described below).

Net exports of goods and services (1–47) is *exports* (1–48) less *imports* (1–49) of goods and services. Income receipts and payments and transfer payments to the rest of the world (net) are excluded.

Government consumption expenditures and gross investment (1–50), the measure of government-sector final demand, consists of two major components: Current consumption expenditures by general government, and gross investment by both general government and government enterprises. Consumption expenditures consists of compensation of general government employees (except own-account invest-

ment¹⁷), consumption of general government fixed capital, and net current purchases from business and from the rest of the world. Consumption expenditures also includes changes in inventories and net purchases of used goods. Current receipts for certain goods and services provided by general government agencies—primarily tuition payments for higher education and charges for medical care—are defined as government sales, which are treated as deductions from government consumption expenditures. Gross investment consists of purchases of new structures and of equipment and software by both general government and government enterprises, net purchases of used structures and equipment, and own-account production of structures and of software. Government consumption expenditures and gross investment does not include current transactions of government enterprises, transfer payments, interest paid or received by government, subsidies, or transactions in financial assets and non-produced assets such as land.

Compensation of employees (1–1) is the income accruing to employees as remuneration for their work. It is the sum of wage and salary accruals and of supplements to wages and salaries.

Wage and salary accruals (1–2) consists of the monetary remuneration of employees, including the compensation of corporate officers; commissions, tips, and bonuses; voluntary employee contributions to certain deferred compensation plans, such as 401(k) plans; employee gains from exercising nonqualified stock options; and receipts in kind that represent income. Wage and salary accruals consists of *disbursements* (1–3) and *wage accruals less disbursements* (1–4). Disbursements is wages and salaries as just defined except that retroactive wage payments are recorded when paid rather than when earned. Accruals less disbursements is the difference between wages earned, or accrued, and wages paid, or disbursed. In the NIPA's, wages accrued is the measure used for national income, and wages disbursed is the measure used for personal income.

Supplements to wages and salaries (1–5) consists of employer contributions for social insurance and of other labor income. *Employer contributions for social insurance* (1–6) consists of employer payments under the following Federal Government and State and local government programs: Old-age, survivors, and disabil-

16. Own-account production refers to an asset produced by a business or government for its own use.

17. Expenditures for own-account production of structures and of software, including compensation of government employees and expenditures for related goods and services, are classified as gross government investment.

ity insurance (social security); hospital insurance; unemployment insurance; railroad retirement; pension benefit guaranty; veterans life insurance; publicly administered workers' compensation; military medical insurance; and temporary disability insurance. *Other labor income* (1–7) consists of employer payments (including payments in kind) to private pension and profit-sharing plans, publicly administered government employee retirement plans, private group health and life insurance plans, privately administered workers' compensation plans, supplemental unemployment benefit plans, and several minor categories of employee compensation (including judicial fees to jurors and witnesses, compensation of prison inmates, and marriage fees to justices of the peace).

Proprietors' income with inventory valuation and capital consumption adjustments (1–8) is the current-production income (including income in kind) of sole proprietorships and partnerships and of tax-exempt cooperatives. The imputed net rental income of owner-occupants of farm dwellings is included; the imputed net rental income of owner-occupants of nonfarm dwellings is included in rental income of persons. Proprietors' income excludes dividends and monetary interest received by nonfinancial business and rental income received by persons not primarily engaged in the real estate business; these incomes are included in dividends, net interest, and rental income of persons. (The inventory valuation and capital consumption adjustments are described below.)

Rental income of persons with capital consumption adjustment (1–9) is the net current-production income of persons (except those primarily engaged in the real estate business) from the rental of real property, the imputed net rental income of owner-occupants of nonfarm dwellings, and the royalties received by persons from patents, copyrights, and rights to natural resources.

Corporate profits with inventory valuation and capital consumption adjustments (1–10) is the net current-production income of organizations treated as corporations in the NIPA's. These organizations consist of all entities required to file Federal corporate tax returns, including mutual financial institutions and cooperatives subject to Federal income tax, private noninsured pension funds,¹⁸ nonprofit institutions that primarily serve business, Federal Reserve banks, and federally

sponsored credit agencies. With several differences, this income is measured as receipts less expenses as defined in Federal tax law. Among these differences are the following: Receipts exclude capital gains and dividends received, expenses exclude depletion and capital losses and losses resulting from bad debts, inventory withdrawals are valued at replacement cost, and depreciation is on a consistent accounting basis and is valued at replacement cost using depreciation profiles based on empirical evidence on used-asset prices that generally suggest a geometric pattern of price declines. Because national income is defined as the income of U.S. residents, its profits component includes income earned abroad by U.S. corporations and excludes income earned in the United States by the rest of the world.

Profits before tax (1–12) is the income of organizations treated as corporations in the NIPA's except that it reflects the inventory-accounting and depreciation-accounting practices used for Federal income tax returns. It consists of profits tax liability, dividends, and undistributed corporate profits.

Profits tax liability (1–13) is the sum of Federal, State, and local government income taxes on all income subject to taxes; this income includes capital gains and other income excluded from profits before tax. The taxes are measured on an accrual basis, net of applicable tax credits.

Profits after tax (1–14) is profits before tax less profits tax liability. It consists of dividends and undistributed corporate profits. *Dividends* (1–15) is payments in cash or other assets, excluding the corporations' own stock, that are made by corporations located in the United States and abroad to stockholders who are U.S. residents. The payments are measured net of dividends received by U.S. corporations. Dividends paid to State and local governments are included. *Undistributed profits* (1–16) is corporate profits after tax less dividends.

Inventory valuation adjustment (IVA) (1–17) is the difference between the cost of inventory withdrawals valued at acquisition cost and the cost of inventory withdrawals valued at replacement cost. The IVA is needed because inventories as reported by business are often charged to cost of sales (that is, withdrawn) at their acquisition (historical) cost rather than at their replacement cost (the concept underlying the NIPA's). As prices change, businesses that value inventory withdrawals at acquisition cost may realize profits or losses. Inventory profits, a capital-gains-like element in busi-

18. The corporate profits that are associated with private noninsured pension plans are recorded as zero, and the property income is recorded as being received directly by persons in the corresponding components of personal income.

ness income (corporate profits and nonfarm proprietors' income), result from an increase in inventory prices, and inventory losses, a capital-loss-like element, result from a decrease in inventory prices. In the NIPA's, inventory profits or losses are shown as adjustments to business income; that is, they are shown as the IVA with the sign reversed. No adjustment is needed to farm proprietors' income because farm inventories are measured on a current-market-cost basis.

Net interest (1–19) is the interest paid by private business less the interest received by private business, plus the interest received from the rest of the world less the interest paid to the rest of the world. Interest payments on mortgage and home improvement loans and on home equity loans are included in interest paid by business because home ownership is treated as a business in the NIPA's. Interest received by private noninsured pension plans is recorded as being directly received by persons in personal income (see below). In addition to monetary interest, net interest includes imputed interest, which is paid by corporate financial business. For regulated investment companies, imputed interest is measured as operating expenses. For depository institutions and life insurance carriers, imputed interest is measured as the difference between the property income received on depositors' or policyholders' funds and the amount of property income paid out explicitly. The imputed interest paid by life insurance carriers attributes their investment income to persons in the period it is earned. The imputed interest payments by financial intermediaries (other than life insurance carriers) to persons, governments, and to the rest of the world have imputed service charges as counterentries in GDP and in income payments to the rest of the world; these charges are included in PCE, in government consumption expenditures and gross investment, and in exports of goods and services, respectively.

Business transfer payments (1–21) consists of payments to persons (1–22) and to the rest of the world (1–23) by private business for which no current services are performed. Business transfer payments to persons consists primarily of liability payments for personal injury and of corporate gifts to nonprofit institutions. Business transfer payments to the rest of the world consists of nonresident taxes—that is, taxes paid by domestic corporations to foreign governments.

Indirect business tax and nontax liability (1–24) consists of (1) tax liabilities that are chargeable to business expense in the calculation of profit-type incomes and

(2) certain other business liabilities to general government agencies that are treated like taxes. Indirect business taxes includes taxes on sales, property, and production. Employer contributions for social insurance are not included. Taxes on corporate incomes are also not included; these taxes cannot be calculated until profits are known, and in that sense, they are not a business expense. Nontaxes includes regulatory and inspection fees, special assessments, fines and forfeitures, rents and royalties, and donations. Nontaxes generally excludes business purchases from general government agencies of goods and services that are similar to those provided by the private sector. Government current receipts from the sales of such products are netted against government consumption expenditures.

Subsidies less current surplus of government enterprises (1–25). *Subsidies* is the monetary grants paid by government agencies to private business and to government enterprises at another level of government. The *current surplus of government enterprises* is their current operating revenue and subsidies received from other levels of government less their current expenses. In the calculation of their current surplus, no deduction is made for net interest paid. The current surplus of government enterprises is not counted as a profit-type income, and therefore, it is not counted as a factor charge. Subsidies and current surplus are shown as a combined entry because deficits incurred by some government enterprises may result from selling goods to business at below-market prices in lieu of giving them subsidies.

Consumption of fixed capital (CFC) (1–26) is the charge for the using up of private and government fixed capital located in the United States. It is defined as the decline in the value of the stock of assets due to wear and tear, obsolescence, accidental damage, and aging. For most types of assets, estimates of CFC are based on geometric depreciation patterns; empirical studies on the prices of used equipment and structures in resale markets have concluded that a geometric pattern of depreciation is appropriate for most types of assets.¹⁹ For general government and for nonprofit institutions that primarily serve individuals, CFC is recorded in government consumption expenditures and

19. Several asset types use depreciation patterns that are not geometric. For example, computers and peripheral equipment and private autos use actual empirical depreciation profiles, and missiles and nuclear fuel rods use a straight-line pattern. For more information on depreciation patterns, see U.S. Bureau of Economic Analysis, *Fixed Reproducible Tangible Wealth in the United States, 1925–94* (Washington, DC: U.S. Government Printing Office, August 1999).

in PCE, respectively, as a partial measure of the value of the current services of the fixed assets owned and used by these entities. *Private capital consumption allowances* consists of tax-return-based depreciation charges for corporations and nonfarm proprietorships and of historical-cost depreciation (calculated by BEA, using a geometric pattern of price declines) for farm proprietorships, rental income of persons, and non-profit institutions. *Private capital consumption adjustment* is the difference between private capital consumption allowances and private CFC.

Income receipts from the rest of the world (1-32) consists of receipts by U.S. residents of foreign interest and dividends, of reinvested earnings of foreign affiliates of U.S. corporations, and of compensation paid to U.S. residents by foreigners.

Income payments to the rest of the world (1-33) consists of payments to foreign residents of U.S. interest and dividends, of reinvested earnings of U.S. affiliates of foreign corporations, and of compensation paid to foreigners by U.S. residents.

Statistical discrepancy (1-35) is GDP less GDI or GNP less GNI. It is recorded in the NIPAs as an "income" component that reconciles the income side with the product side of the accounts. As noted above, it arises because the two sides are estimated using independent and imperfect data. In particular, much of the data used for estimating GDP and GDI are based on samples rather than on complete enumerations, and some of the data are from tax return information that must be adjusted for misreporting and to conform to NIPA accounting concepts; the source data also vary in the timeliness and comprehensiveness of coverage.²⁰

Personal income and outlay account

Personal income is the sum of wage and salary disbursements, other labor income, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and transfer payments to persons, less personal contributions for social insurance. Property income (interest, dividends, and rent) received by private noninsured pension plans and by government employee retirement plans are recorded as being received directly by persons in the corresponding components of personal income.

20. For additional details on the statistical discrepancy, see Robert P. Parker and Eugene P. Seskin, "Annual Revision of the National Income and Product Accounts," SURVEY 77 (August 1997): 19.

Wage and salary disbursements (see 1-3).

Other labor income (see 1-7).

Proprietors' income with inventory valuation and capital consumption adjustments (see 1-8).

Rental income of persons with capital consumption adjustment (see 1-9).

Personal dividend income (2-11) is the dividend income of persons from all sources. It equals net dividends paid by corporations (see 1-15) less *dividends received by government* (2-13), which consists of dividends received by State and local governments.

Personal interest income (2-14) is the interest income (monetary and imputed) of persons from all sources. It equals net interest (see 1-19) plus *net interest paid by government* (2-16) plus *interest paid by persons* (2-17). The last item consists of all interest paid by individuals except mortgage interest, which is reflected in rental income of persons.

Transfer payments to persons (2-18) is income payments to persons for which no current services are performed. It consists of business transfer payments to persons (see 1-22) and *government transfer payments* (2-20). Government transfer payments includes benefits from the following social insurance funds: Old-age, survivors, and disability insurance (social security); hospital insurance; supplementary medical insurance; unemployment insurance; railroad retirement; pension benefit guaranty; veterans life insurance; workers' compensation; military medical insurance; and temporary disability insurance. Government transfer payments also includes benefits from certain other programs: Veterans benefits other than life insurance, food stamps, black lung, supplemental security income, public assistance (including medical care and family assistance), and educational assistance. Government payments to nonprofit institutions excluding payments for work under research and development contracts are also included.

Personal contributions for social insurance (2-21) includes payments by employees, self-employed, and other individuals who participate in the following government programs: Old-age, survivors, and disability insurance (social security); hospital insurance; supplementary medical insurance; unemployment insurance; railroad retirement; veterans life insurance; and temporary disability insurance.

Personal tax and nontax payments (2-1) is tax payments (net of refunds) by U.S. residents that are not chargeable to business expense and certain other personal payments to government agencies (except gov-

ernment enterprises) that are treated like taxes. Personal taxes includes taxes on income, including realized net capital gains, and on personal property. Nontaxes includes donations and fees, fines, and forfeitures. Personal contributions for social insurance is not included. Taxes paid by U.S. residents to foreign governments and taxes paid by foreigners to the U.S. Government are both included in transfer payments to the rest of the world (net).

Personal outlays (2-2) is the sum of personal consumption expenditures (see 1-36), interest paid by persons (see 2-17), and *personal transfer payments to the rest of the world (net)* (2-5). The last item is personal remittances in cash and in kind to the rest of the world less such remittances from the rest of the world.

Personal saving (2-6) is personal income less the sum of personal outlays and personal tax and nontax payments. It is the current saving of individuals (including proprietors and partnerships), nonprofit institutions that primarily serve individuals, life insurance carriers, private noninsured welfare funds, private noninsured pension plans, publicly administered government employee retirement plans, and private trust funds. Personal saving may also be viewed as the net acquisition of financial assets (such as cash and deposits, securities, and the change in life insurance and pension fund reserves), plus the net investment in produced assets (such as residential housing, less depreciation), less the net increase in financial liabilities (such as mortgage debt, consumer credit, and security credit), less net capital transfers received.

Government receipts and expenditures account

Personal tax and nontax payments (see 2-1).

Corporate profits tax liability (see 1-13).

Indirect business tax and nontax liability (see 1-24).

Contributions for social insurance (see 1-6 and 2-21).

Consumption expenditures (see 1-50).

Transfer payments (3-2) is transfer payments to persons (see 2-20) and *transfer payments to the rest of the world (net)* (3-4). The latter consists of U.S. Government military and nonmilitary grants in cash and nonmilitary grants in kind to foreign governments and of U.S. Government transfers, mainly retirement benefits, to former residents of the United States.

Net interest paid (3-5) is interest paid by government to persons, to business, and to the rest of the world (that is, to foreign businesses, governments, and persons) less interest received by government from persons, from business, and from the rest of the world.

Interest paid consists of monetary interest paid on public debt and other financial obligations. Interest received consists of monetary and imputed interest received on loans and investments. (Interest received by government employee retirement plans is recorded as being received directly by persons in personal income.)

Dividends received by government (see 2-13).

Subsidies less current surplus of government enterprises (see 1-25).

Wage accruals less disbursements (see 1-4).

Current surplus or deficit (-), *national income and product accounts* (3-9), a measure of government net saving, is the sum of government current receipts (lines 12, 13, 14, and 15 of account 3) less the sum of government current expenditures (lines 1, 2, 5, 6, 7, and 8 of account 3). It may also be viewed as the net acquisition of financial assets by government and government enterprises, plus the net investment in fixed assets (such as roads and highways, less depreciation), plus the net government purchases of nonproduced assets, less the net increase in financial liabilities, less net capital transfers.

Foreign transactions account

Imports of goods and services (see 1-49).

Income payments to the rest of the world (see 1-33).

Transfer payments to the rest of the world (see 1-23, 2-5, and 3-4).

Net foreign investment (4-9) is U.S. exports of goods and services and income receipts from the rest of the world less U.S. imports of goods and services, income payments to the rest of the world, and transfer payments to the rest of the world (net). It may also be viewed as the acquisition of foreign assets by U.S. residents less the acquisition of U.S. assets by foreign residents. It includes the statistical discrepancy in the international transactions accounts.

Exports of goods and services (see 1-48).

Income receipts from the rest of the world (see 1-32).

Gross saving and investment account

Personal saving (see 2-6).

Wage accruals less disbursements (see 1-4).

Undistributed corporate profits with inventory valuation and capital consumption adjustments (see 1-16, 1-17, and 1-18).

Consumption of fixed capital (see 1-26).

Government current surplus or deficit (-), *national income and product accounts* (see 3-9).

Statistical discrepancy (see 1-35).

Gross private domestic investment (see 1–40).

Gross government investment (see 1–50).

Net foreign investment (see 4–9).

Other definitions

Final sales of domestic product is GDP minus change in private inventories; equivalently, it is the sum of PCE, private fixed investment, government consumption expenditures and gross investment, and net exports of goods and services.

Gross domestic purchases is the market value of goods and services purchased by U.S. residents, regardless of where those goods and services were produced. It is GDP minus net exports of goods and services; equivalently, it is the sum of PCE, gross private domestic investment, and government consumption expenditures and gross investment.

Final sales to domestic purchasers is gross domestic purchases minus change in private inventories.

Fixed assets are produced assets that are themselves used repeatedly, or continuously, in processes of production for an extended period of time. Fixed assets consist of equipment, software, and structures (including, by convention, owner-occupied housing); consumer durable goods are not included.

Produced assets are nonfinancial assets that have come into existence as outputs from a production process; they include fixed assets and private inventories.

Nonproduced assets are nonfinancial assets that are used for production but have not themselves been produced; they include naturally occurring assets, such as land and mineral deposits.

Population is the total population of the United States, including the Armed Forces overseas and the institutionalized population. The monthly estimate is the average of Census Bureau survey estimates for the first of the month and the first of the following month; the quarterly and annual estimates are the averages of the relevant monthly estimates.

Personal saving as a percentage of disposable personal income (DPI), frequently referred to as “the personal saving rate,” is calculated on a monthly, quarterly, and annual basis as the ratio of personal saving to DPI.

Gross saving as a percentage of gross national product (GNP), sometimes referred to as “the national saving rate,” is calculated on a quarterly and annual basis as the ratio of gross saving—the sum of gross private saving and gross government saving—to GNP. *Gross private saving* consists of personal saving, undistributed corporate profits with inventory valuation and capital

consumption adjustments, corporate and noncorporate consumption of fixed capital (CFC), and wage accruals less disbursements. *Gross government saving* consists of government CFC plus current surplus or deficit for the Federal Government and for State and local governments.

U.S. residents are individuals, governments, business enterprises, trusts, associations, nonprofit organizations, and similar institutions that have the center of their economic interest in the United States and that reside or expect to reside in the United States for 1 year or more. (For example, business enterprises resident in the United States include U.S. affiliates of foreign companies.) In addition, U.S. residents include all U.S. citizens who reside outside the United States for less than 1 year and U.S. citizens residing abroad for 1 year or more who meet one of the following criteria: Owners or employees of U.S. business enterprises who reside abroad to further the enterprises’ business and who intend to return within a reasonable period; U.S. Government civilian and military employees and members of their immediate families; and students who attend foreign educational institutions.

Foreign residents are those residing and pursuing economic interests outside the United States. They also include international institutions located in the United States, foreign nationals employed by their home governments in the United States, and foreign affiliates of U.S. companies.

The rest of the world consists of foreign residents who are transactors with U.S. residents.

Real Output and Related Measures

The chain-type quantity and price indexes, in combination with the current-dollar estimates, provide users with the basic data series from which all other analytical tables and presentations of the NIPA’s are derived. The chained (1996) dollar, or “real,” estimates provide measures to calculate the percent changes for GDP and its components that are consistent with those calculated from the chain-type quantity indexes. For most components of GDP, these estimates also provide rough approximations of their relative importance and of their contributions to real GDP growth for the years close to 1996. However, for components for which relative prices are changing rapidly, such as computers and peripheral equipment, calculations of contributions using chained-dollar estimates may be misleading, even very close to the reference year. For most analyses, the current-dollar, or “nominal,” estimates

provide more appropriate measures of the relative importance of GDP components, and the contributions tables (described below) present the appropriate measures of contributions to real growth.

Quantity and price indexes

Changes in current-dollar GDP measure the changes in the market value of the goods, services, and structures produced in the economy in a particular period. These changes can be decomposed into quantity and price components. Quantities and prices are expressed as index numbers with the reference year—at present, the year 1996—equal to 100. Percent changes in real GDP and its components are equal to the percent changes of the quantity indexes; percent changes in prices are equal to the percent changes of the price indexes.

The annual changes in quantities and prices in the NIPA's are calculated using a Fisher formula that incorporates weights from 2 adjacent years. For example, the 1996–97 change in real GDP uses prices for 1996 and 1997 as weights, and the 1996–97 change in prices uses quantities for 1996 and 1997 as weights.²¹ These annual changes are “chained” (multiplied) together to form time series of quantity and price indexes. (For more details, see the box “[Basic Formulas for Calculating Chain-Type Quantity and Price Indexes](#)” on the next page.)

Quarterly changes in quantities and prices are calculated using a Fisher formula that incorporates weights from two adjacent quarters; quarterly indexes are adjusted for consistency to the annual indexes before percent changes are calculated.

The Fisher indexes have several advantages over the fixed-weighted measures of real output and prices that were featured before the 1996 comprehensive revision of the NIPA's: (1) Elimination of substitution bias in

real GDP growth that tends to cause an understatement of growth for periods before the reference year and an overstatement of growth for periods after the reference year, (2) elimination of the distortion of growth in components and in industries that result from the fixed-weighted indexes, and (3) elimination of the anomalies that arise from using recent-period price weights to measure periods in the past when a far different set of prices prevailed.²²

The Fisher formula produces percent changes in quantities and prices that are not affected by the choice of reference year. In addition, because the formulas for calculating the changes in quantities and prices in this way are symmetric, the product of a quantity index and the corresponding price index, in general, equals the current-dollar index.²³

Chain-type quantity and price indexes that correspond to most of the current-dollar output, product, and expenditure measures are presented in tables 7.1–7.14 and 7.17–7.20.²⁴ Percentage changes from the preceding period for GDP and its major components and for other aggregates are presented in table 8.1. Contributions by major components to changes in real GDP and to changes in other major aggregates are presented in tables 8.2–8.6.

Chained-dollar measures

BEA also prepares measures of real GDP and its components in a dollar-denominated form, designated “chained (1996) dollar estimates.” For GDP and for most other series, these estimates are computed by multiplying the 1996 current-dollar value by a corresponding quantity index number divided by 100. For example, if a current-dollar GDP component equaled \$100 in 1996 and if real output for this component increased 10 percent in 1997, then the chained (1996) dollar value of this component would be \$110 ($\100×1.10) in 1997. (For a list of the

21. Because the source data available for most components of GDP are measured in dollars rather than in units, the quantities of most of the detailed components used to calculate percent changes are obtained by deflation. For deflation, quantities are approximated by real values (expressed at present with 1996 as the reference year) that are calculated by dividing the current-dollar value of the component by its price index, where the price index uses 1996 as the reference year.

Two other methods, quantity extrapolation and direct base-year valuation, are also used to calculate real values for a number of the most detailed GDP components. For quantity extrapolation, the real values are obtained by extrapolating the reference-year current-dollar estimates in both directions from the reference year (1996) by quantity indicators; for example, the real values for mining exploration, shafts, and wells structures are extrapolated using oilwell footage drilled. For direct reference-year valuation, the real values are obtained by multiplying reference-year prices by quantity data for each period; for example, the real values of natural gas inventories are calculated using quantities and prices of natural gas stocks.

22. For further discussion, see Jack E. Triplett, “Economic Theory and BEA's Alternative Quantity and Price Indexes,” *SURVEY* 72 (April 1992): 49–52; and J. Steven Landefeld and Robert P. Parker, “BEA's Chain Indexes, Time Series, and Measures of Long-Term Economic Growth,” *SURVEY* 77 (May 1997): 58–68.

23. For the annual estimates of GDP, this relationship does not hold exactly because of the price-data conventions used to calculate the change in private inventories and the change in Commodity Credit Corporation inventories, a component of government consumption expenditures. In addition, the relationship does not hold exactly for the quarterly series, because all quarterly chain-type quantities and prices are adjusted to average to the corresponding annual estimates.

24. Indexes are not presented for change in private inventories, for net exports, and for most of the “net” series in tables 7.5, 7.7, 7.11, 7.13, 7.19, and 7.20. Indexes for these series are not meaningful.

chained-dollar series that are not calculated this way, see the box “Chained Measures in the NIPAs That Are Not Calculated as Fisher Indexes.”)

For analyses of changes over time in an aggregate or in a component, the percentage changes calculated from the chained-dollar estimates and from the chain-

Basic Formulas for Calculating Chain-Type Quantity and Price Indexes

This box shows the basic calculations used to prepare annual and quarterly chain-type quantity and price indexes. See also the box “Chained Measures in the NIPAs That Are Not Calculated as Fisher Indexes.”

Annual indexes

The formula used to calculate the annual change in real GDP and other components of output and expenditures is a Fisher index (Q_t^F) that uses weights for 2 adjacent years (years $t-1$ and t).

The formula for real GDP in year t relative to its value in year $t-1$ is

$$Q_t^F = \sqrt{\frac{\sum p_{t-1} q_t}{\sum p_{t-1} q_{t-1}} \times \frac{\sum p_t q_t}{\sum p_t q_{t-1}}},$$

where the p 's and q 's represent prices and quantities of detailed components in the 2 years.

Because the first term in the Fisher formula is a Laspeyres quantity index (Q_t^L), or

$$Q_t^L = \frac{\sum p_{t-1} q_t}{\sum p_{t-1} q_{t-1}},$$

and the second term is a Paasche quantity index (Q_t^P), or

$$Q_t^P = \frac{\sum p_t q_t}{\sum p_t q_{t-1}},$$

the Fisher formula can also be expressed for year t as the geometric mean of these indexes as follows:

$$Q_t^F = \sqrt{Q_t^L \times Q_t^P}.$$

The percent change in real GDP (or in a GDP component) from year $t-1$ to year t is calculated as

$$100(Q_t^F - 1.0).$$

Similarly, price indexes are calculated using the Fisher formula

$$P_t^F = \sqrt{\frac{\sum p_t q_{t-1}}{\sum p_{t-1} q_{t-1}} \times \frac{\sum p_t q_t}{\sum p_{t-1} q_t}},$$

which is the geometric mean of a Laspeyres price index (P_t^L) and a Paasche price index (P_t^P), or

$$P_t^F = \sqrt{P_t^L \times P_t^P}.$$

The chain-type quantity index value for period t is

$$I_t^F = I_{t-1}^F \times Q_t^F,$$

and the chain-type price index is calculated analogously. Chain-type real output and price indexes are presented with the reference year (b) equal to 100; that is, $I_b=100$.

The current-dollar change from year $t-1$ to year t expressed as a ratio is equal to the product of the Fisher price and quantity indexes:¹

$$\frac{\sum p_t q_t}{\sum p_{t-1} q_{t-1}} = \sqrt{\frac{\sum p_t q_{t-1}}{\sum p_{t-1} q_{t-1}} \times \frac{\sum p_t q_t}{\sum p_{t-1} q_t}} \times \sqrt{\frac{\sum p_{t-1} q_t}{\sum p_{t-1} q_{t-1}} \times \frac{\sum p_t q_t}{\sum p_t q_{t-1}}} = P_t^F \times Q_t^F.$$

Quarterly indexes

The same formulas are used to calculate the quarterly indexes except that quarterly data are substituted for annual data.

All quarterly chain-type indexes for completed years that have been included in an annual or comprehensive revision are adjusted so that the quarterly indexes average to the corresponding annual index. When an additional year is completed between annual revisions, the annual index is computed as the average of the quarterly indexes, so no adjustment is required to make the quarterly and annual indexes consistent. For example, until the 2000 annual revision was released, the chain-type indexes for the year 1999 were computed as the average of the four quarterly indexes for 1999.

Chained-dollar estimates

The chained-dollar value (CD_t^F) is calculated by multiplying the index value by the reference-year current-dollar value ($\sum p_b q_b$) and dividing by 100. For period t ,

$$CD_t^F = \left(\sum p_b q_b \times I_t^F / 100 \right).$$

Implicit price deflators

The implicit price deflator (IPD_t^F) for period t is calculated as the ratio of the current-dollar value to the corresponding chained-dollar value multiplied by 100 as follows:

$$IPD_t^F = \frac{\sum p_t q_t}{CD_t^F} \times 100.$$

1. See also footnote 23 on page M-15.

type quantity indexes are the same; any differences will be small and due to rounding. Thus, chained-dollar estimates are most appropriately interpreted as index numbers with a reference value other than 100. However, because the relative prices used as weights for any period other than the reference year differ from those used for the reference year, the chained-dollar values for the detailed GDP components will not necessarily sum to the chained-dollar estimate of GDP or of any intermediate aggregate. A measure of the extent of such differences is provided by a “residual” line, which indicates the difference between GDP (or another major aggregate) and the sum of the most detailed components in the table.

For periods close to the reference year, when there usually has not been much change in the relative prices that are used as the weights for the chain-type index, the residuals tend to be small, and the chained (1996) dollar estimates can be used to approximate the contributions to growth and to aggregate the detailed estimates.

As one moves further from the reference year, the residual tends to become larger, and the chained-dollar

estimates become less useful for economic analysis. For this reason, most of the chained-dollar series for detailed components are shown beginning with 1987.²⁵ In general, the use of chained-dollar estimates to calculate component shares or component contributions to real growth may be misleading for periods away from the reference year. Thus, contributions to percent change shown in tables 8.2–8.6 provide better measures of the composition of GDP growth and that of its major aggregates. In particular, for components for which relative prices are changing rapidly, such as computers and peripheral equipment, calculations of contributions using chained-dollar estimates may be misleading even very close to the reference year (and the residuals in the corresponding chained-dollar tables may be large).

Tables 8.2–8.6 use exact formulas for attributing growth to the components of GDP and of other aggregates, but the presentation is limited to the contributions to change from the preceding year or quarter.

25. Chained (1996) dollar estimates for selected series for earlier periods are shown in tables 1.2, 1.4, 1.6, 1.8, 1.10, 1.11, 1.16, 2.9, 5.11, 5.13, and 8.7.

Chained Measures in the NIPA's That Are Not Calculated as Fisher Indexes

The Fisher formula described in the box “Basic Formulas for Calculating Chain-Type Quantity and Price Indexes” is generally preferred for calculating the chain-type quantity and price indexes presented in the NIPA's. In the preferred method, chained dollars are obtained by multiplying the Fisher quantity index by the reference-year current-dollar value and dividing by 100. However, when the components of an aggregate include large negative values, the Fisher formula may require taking the square root of a negative number. For these aggregates, another method for calculating chained dollars must be used. The inability to calculate a particular Fisher quantity index (for example, change in private inventories) because of negative values usually does not extend to the calculation of higher level aggregates (for example, quantity indexes for gross private domestic investment and for GDP can be computed). The calculation of contributions to percent change is not affected by negative values, so they can be calculated for all components. The following paragraphs describe the cases for which the Fisher formula cannot be used.

For change in private inventories (in tables 1.2, 1.4, 1.6, 5.3, 5.11, 8.9B, and 8.11), chained-dollar series are calculated as the difference between end-of-period and beginning-of-period chain-weighted stocks of inventories.

The following chained-dollar series are calculated as the current-dollar value of the series divided by an appropriate implicit price deflator: Gross national in-

come and gross domestic income (in table 1.10); command-basis exports of goods and services and income receipts from the rest of the world (in table 1.11); and disposable personal income (in tables 2.1 and 2.9).

For the following series, real values are calculated as the sum of, or the difference between, chained-dollar series measuring flows: Net exports of goods and services (in table 1.2); command-basis gross national product (in table 1.11); net domestic product of nonfinancial corporate business (in table 1.16); foreign travel and other, net (in table 2.5); net foreign travel and net foreign remittances (in table 2.7); Federal nondefense consumption expenditures for durable goods, for nondurable goods, and for Commodity Credit Corporation inventory change (in table 3.8); Federal defense consumption expenditures for other durable goods (in table 3.11); net investment by major type (in table 5.3); residential and nonresidential private net purchases of used structures (in table 5.7); Federal defense and nondefense net purchases of used structures (in table 5.15); and net exports of motor vehicles (in table 8.9B).

For the following series, quantity indexes are calculated by dividing the chained-dollar series by its reference year (that is, 1996) value and multiplying by 100: Command-basis GNP and command-basis exports of goods and services and receipts from the rest of the world (in table 7.3); and income receipts from the rest of the world (in table 7.9).

(For details, see the box below.) For some analytical purposes, it may be desirable to calculate contributions to growth for more than a single quarter or year or to calculate contributions to growth for aggregates not shown in tables 8.2–8.6. An article in the SURVEY provides information on how to prepare chained-dollar series with different reference years that permit the calculation of close approximations of contributions to real growth for any period.²⁶ This article shows how to calculate a chained-dollar series for any period by using the percent changes in the chain-type indexes to compute chained-dollar series indexed to the current dollars of whatever reference year is appropriate for the analysis. In the article, different reference years are used depending upon the time period analyzed; for example, for decades and business cycles, the midpoints of the periods are used.

In this publication, tables 1.2A, 1.2B, 1.2C, and 1.2D present annual estimates of real GDP and its major components in chained (1937) dollars, chained (1952) dollars, chained (1972) dollars, and chained (1982) dollars, respectively. However, users should be aware that contributions calculated from these tables are approximations and may produce misleading results for periods far from those reference years or when relative prices are changing rapidly, such as during the energy crisis of 1973–75.

The presentation in this publication of chained-dollar estimates before 1987 has been limited to key

aggregates. However, detailed quantity indexes, which are accurate for all periods, are presented in tables 7.3–7.14 and 7.17–7.20, most of which begin with 1929. These quantity indexes can be used in place of chained-dollar estimates in analyses that require data on real GDP or its components over time, as well as to calculate percent changes. For GDP and its major components and for other measures of output, annual growth rates beginning with 1930 and quarterly growth rates beginning with the second quarter of 1947 are presented in table 8.1.

Price indexes

BEA's featured aggregate price measure is the price index for gross domestic purchases, which measures the prices paid for goods and services *purchased* by U.S. residents. This index is derived from the prices of PCE, gross private domestic investment, and government consumption expenditures and gross investment. In contrast, the GDP price index measures the prices paid for goods and services *produced* by the U.S. economy and is derived from the prices of PCE, gross private domestic investment, net exports, and government consumption expenditures and gross investment. Thus, the two indexes differ with respect to coverage of the prices of exported and imported goods and services. Price changes in goods and services produced abroad and sold in the United States are reflected in the gross domestic purchases measure but not in the GDP measure; price changes in goods and services produced by the U.S. economy and sold abroad are reflected in the

26. See Landefeld and Parker, "BEA's Chain Indexes," 63–66.

Calculating the Contributions of Components to the Change in GDP and in Other Major Aggregates

The contributions to percent change in a real aggregate, such as real GDP, provide a measure of the composition of growth in the aggregate that is not affected by the non-additivity of its components. This property makes contributions to percent change a valuable tool for economic analysis. The contribution to percent change ($C_{i,t}^Q$) in an aggregate in period t that is attributable to the quantity change in component i is defined by the formula

$$C_{i,t}^Q = 100 \times \frac{(p_{i,t-1} + (p_{i,t}/P_t^F)) \times (q_{i,t} - q_{i,t-1})}{\sum_j (p_{j,t-1} + (p_{j,t}/P_t^F)) \times q_{j,t-1}}$$

where P_t^F is the Fisher price index for the aggregate in period t relative to period $t-1$; $p_{i,t}$ is the price of the component i in period t ; and $q_{i,t}$ is the quantity of the component i in period t .

The summation with subscript j in the denominator includes all the deflation-level components of the aggregate.

Contributions of subaggregates (such as PCE goods) to the percent change of the aggregate (say, PCE or GDP) are calculated by summing the contributions of all the deflation-level components contained in the sub-aggregate.

For annual estimates, no adjustments are required for contributions to sum exactly to the percent change in the aggregate. For quarterly estimates, adjustments are required to offset the effects of adjustments made to published aggregates and their quarterly percent change: namely, conforming quarterly estimates to average to the corresponding annual estimates, and expressing percent change at annual rate. The same formula is used for both annual and quarterly estimates of contributions to percent change in all periods. The only variation in the method of calculation is that when the annual contributions for the most recent year are first calculated, they are based on a weighted average of the quarterly contributions until the next annual revision.

GDP price measure but not in the gross domestic purchases price measure. For example, a change in the price of imported petroleum that is fully passed on to U.S. consumers would be fully reflected in the price index for gross domestic purchases but not in the GDP price index, because imports are subtracted in deriving GDP.

Implicit price deflators

BEA also prepares another price index, the implicit price deflator (IPD), which is calculated as the ratio of the current-dollar value to the corresponding chained-dollar value, multiplied by 100 (see the box “Basic Formulas for Calculating Chain-Type Quantity and Price Indexes” on page M–16). The values of the IPD are very close to the values of the corresponding chain-type price index for all periods.²⁷

IPD’s for GDP and its major components are presented as index numbers in table 7.1, and percentage changes from the preceding period for these measures are presented in table 8.1.

Command-basis GNP and terms of trade

BEA also prepares another measure of “real” output—*command-basis GNP* (see table 1.11). Command-basis GNP is a measure of the goods and services produced by the U.S. economy in terms of their purchasing power. GNP and command-basis GNP differ in how their real values are prepared: In estimating real GNP, the current-dollar values of the detailed components of exports of goods and services are deflated by export prices, the current-dollar values of the detailed components of imports of goods and services are deflated by import prices, and the current-dollar value of most factor income is deflated by the IPD for final sales to domestic purchasers. In estimating command-basis GNP, the current-dollar value of the sum of exports of goods and services and of income receipts is deflated by the IPD for the sum of imports of goods and services and of income payments.

The *terms of trade* is a measure of the relationship between the prices that are received by U.S. producers for exports of goods and services and the prices that are paid by U.S. purchasers for imports of goods and services. It is measured by the following ratio, with the decimal point shifted two places to the right: In the numerator, the IPD for the sum of exports of goods and services and of income receipts; in the denominator, the IPD for the sum of imports of goods and services

and of income payments. Changes in the terms of trade reflect the interaction of several factors, including movements in exchange rates, changes in the composition of traded goods and services, and changes in producers’ profit margins. For example, if the U.S. dollar depreciates against a foreign currency, a foreign manufacturer may choose to absorb this cost by reducing the profit margin on the product it sells to the United States, or it may choose to raise the price of the product and risk a loss in market share.

Classifications of Production

In the NIPA’s, production is classified by type of product, by sector, by legal form of organization, and by industry.

Type of product

Type of product classifications—goods (durable and nondurable), services, and structures—are presented for GDP and the components of final sales of domestic product. Goods are tangible products that can be stored or inventoried, services are products that cannot be stored and are consumed at the place and time of their purchase, and structures are products that are usually constructed at the location where they will be used and that typically have long economic lives. In cases in which a product has characteristics of more than one of these classifications (for example, restaurant meals), or in which source data do not provide detail on type of product (for example, foreign travel), the product is classified on the basis of the dominant characteristic.

Accordingly, the following products are included in goods: Restaurant meals; expenditures abroad by U.S. residents except for travel (for example, expenditures of U.S. military and embassy personnel abroad); replacement parts whose installation cost is minimal; dealers’ margins on used equipment; and movable household appliances, such as refrigerators, even when they are included in the purchase price of a new home.

The following products are included in services: Food that is included in airline transportation and hospital charges; natural gas and electricity (except in exports and imports); goods and services that are included in current operating expense of nonprofit institutions (for example, office supplies); foreign travel by U.S. residents; expenditures in the United States by foreigners; repair services, which include the cost of parts (except replacement parts whose installation cost is minimal); defense research and development; and exports and imports of certain goods, primarily military

27. The two measures of the price level differ only because of the factors that are cited in footnote 23.

equipment purchased and sold by the Federal Government.

The following products are included in structures: Manufactured homes; certain types of installed equipment, such as elevators, heating, and air conditioning systems; brokers' commissions on sale of structures; architectural and engineering fees included in the value of structures; land development costs; and mining exploration, shafts, and wells.

In PCE, exports, imports, and government consumption expenditures and gross investment, durable goods have an average life of at least 3 years. In fixed investment, equipment and software consists of goods that have an average life of at least 1 year. In change in private inventories, goods held by manufacturing and trade establishments are classified as durable goods or nondurable goods in accordance with the classification of the industry of the establishment holding the inventories. Inventories held by construction establishments are classified as durable goods. Inventories held by establishments other than those in manufacturing, trade, and construction are classified as nondurable goods.

Sector

In the NIPA's, a breakdown of GDP is also shown in terms of the three sectors of the economy—business, households and institutions, and general government.

Business. Production by all entities that produce goods and services for sale at a price intended at least to approximate the costs of production, corporate and noncorporate private entities organized for profit, and certain other entities that are treated as business in the NIPA's. These entities include mutual financial institutions, private noninsured pension funds, cooperatives, nonprofit organizations (that is, entities classified as nonprofit by the Internal Revenue Service (IRS) in determining income tax liability) that primarily serve business, Federal Reserve banks, federally sponsored credit agencies, and government enterprises.²⁸ Business production also includes the services of owner-occupied housing and of buildings and equipment and software owned and used by nonprofit institutions that primarily serve individuals. Gross product of the business sector is measured as GDP less the gross product of households and institutions and of general government.²⁹

28. For more detail on government enterprises, see the section "Legal form of organization."

29. Gross product of financial and of nonfinancial corporations are also shown in the NIPA tables. They are calculated on the basis of the costs incurred and the incomes earned from production.

Households and institutions. Production by households, consisting of families and unrelated individuals, and by nonprofit institutions that primarily serve individuals. Gross product of households and institutions is measured by the compensation paid to domestic workers and to the employees of these nonprofit institutions.

General government. Production of all Federal Government and State and local government agencies except government enterprises. Gross product of general government is measured as the sum of the compensation of the employees of these agencies and of the consumption of fixed capital (CFC).

Legal form of organization

For the domestic business sector, income and its components are shown for four legal forms of organization—corporate business, sole proprietorships and partnerships, other private business, and government enterprises (employee compensation only).

Corporate business. All entities required to file Federal corporate tax returns (IRS Form 1120 series). These entities include mutual financial institutions and cooperatives subject to Federal income tax, nonprofit institutions that primarily serve business, Federal Reserve banks, and federally sponsored credit agencies.

Sole proprietorships. All entities that would be required to file IRS Schedule C (Profits or Loss from Business) or Schedule F (Farm Income and Expenses) if the proprietor met the filing requirements, together with owner-occupied farm housing.

Partnerships. All entities required to file Federal partnership income tax returns, IRS Form 1065 (U.S. Partnership Return of Income).

Other private business. All entities that would be required to report rental and royalty income on the individual income tax return in IRS Schedule E (Supplemental Income and Loss) if the individual met the filing requirements, tax-exempt cooperatives, owner-occupied nonfarm housing, and buildings and equipment and software owned and used by nonprofit institutions that primarily serve individuals.

Government enterprises. Government agencies that cover a substantial proportion of their operating costs by selling goods and services to the public and that maintain their own separate accounts. A "mixed" treatment of government enterprises is used in the NIPA's: Some types of transactions are recorded as if they were part of the business sector, and others are re-

corded as if they were part of the general government sector.

The following transactions of government enterprises are treated like those of businesses and included in the NIPA business sector: (1) Their sales to final users are recorded as sales by businesses, (2) their purchases of materials and business services are considered intermediate, and (3) their compensation payments and CFC are deducted in calculating their income. Within the business sector, government enterprises are classified as noncorporate businesses.

Other transactions of government enterprises are treated like those of other government agencies: (1) Their interest payments are combined with those of general government rather than those of business, (2) their investment in equipment and software and in structures is combined with general government investment rather than with business investment in gross private domestic investment, and (3) their profit-like income, the current surplus of government enterprises (see the definition on page M–10), accrues to general government.

Industry

Industrial distributions are presented for national income and its components, capital consumption allowances, employment and hours, and the change in private inventories and the stock of private inventories.³⁰ The classification underlying the distributions of private activities in this publication is based on the Standard Industrial Classification (SIC).³¹ BEA and other Federal statistical agencies have begun to adopt the new North American Industry Classification System.³²

The industry distributions in most of the tables in “Income, Employment, and Product by Industry”

30. An industrial distribution of fixed investment based on data collected from establishments is prepared as part of the procedure used to estimate capital stock. For further information, see *Fixed Reproducible Tangible Wealth in the United States*.

Industrial distributions of gross output, intermediate inputs, and gross product are also prepared; for further information, see Sherlene K.S. Lum, Brian C. Moyer, and Robert E. Yuskavage, “Gross Product by Industry, 1947–98,” *SURVEY 80* (June 2000): 24–54.

31. Office of Management and Budget, Statistical Policy Division, *Standard Industrial Classification Manual, 1987* (Washington, DC: U.S. Government Printing Office (GPO), 1988); Office of Management and Budget, Statistical Policy Division, *Standard Industrial Classification Manual, 1972* (Washington, DC: GPO, 1972); and Bureau of the Budget, *Standard Industrial Classification Manual, 1942* (Washington, DC: GPO, 1942).

32. For more information, see “The North American Industry Classification System in BEA’s Economic Accounts,” *SURVEY 81* (May 2001): 7–13, “An Upcoming Change in the NIPA Presentation of Private Inventories by Industry,” *SURVEY 81* (June 2001): 22–26, and “Annual Revision of the National Income and Product Accounts,” *SURVEY 81* (August 2001): 7–32.

(category 6) are shown as follows: Estimates for 1929–48 that are based on the 1942 SIC are shown in tables designated as part A; estimates for 1948–87 that are based on the 1972 SIC are shown as part B; and estimates for 1987–97 that are based on the 1987 SIC are shown as part C. The industry distributions based on the 1987 SIC reflect the corresponding shift of most of the NIPA source data. The estimates for earlier years have not been adjusted to the 1987 SIC, because of a lack of adequate source data. Instead, the estimates for 1948 are shown on the basis of both the 1942 and 1972 SIC, and the estimates for 1987 are shown on the basis of both the 1972 and the 1987 SIC.

Industrial distributions of government activities are not provided; instead, they are combined into a single category. For most series, separate estimates are shown for the activities of the Federal Government, of State and local governments, and of government enterprises. Expenditures by the Federal Government and by State and local governments are also shown by type and by function.

The industrial distributions for private activities are based on data collected from “establishments” or from “companies” (also called enterprises, or firms). Establishments, as defined in the SIC, are economic units, generally at a single physical location, where business is conducted or where services or industrial operations are performed. Companies consist of one or more establishments owned by the same legal entity or group of affiliated entities. Establishments are classified into an SIC industry on the basis of their principal product or service, and companies are classified into an SIC industry on the basis of the principal SIC industry of all their establishments. Because large multiestablishment companies typically own establishments that are classified in different SIC industries, the industrial distribution of the same economic activity on an establishment basis can differ significantly from that on a company basis. For example, employment of steel-manufacturing companies differs from employment of steel-manufacturing establishments because the employment of these companies includes the employment of establishments that are not classified in steel manufacturing and because it excludes the employment of establishments that manufacture steel but that are not owned by steel-manufacturing companies.

Industrial distributions on a consistent establishment or company basis are not available for all NIPA components. As a result, the industrial distribution of national income reflects a mix of establishment and

company data. For the following series, the industrial distributions are based on establishment data: Compensation of employees, employment, hours, inventories, rental income of persons, farm proprietors' income, farm net interest, and farm noncorporate capital consumption allowances. For nonfarm proprietors, industrial distributions of proprietors' income, net interest, and capital consumption allowances are based on company data; these data are regarded as being substantially the same as if they were based on establishment data because nearly all unincorporated companies own only one establishment (and the few multi-establishment companies usually own establishments in the same SIC industry). For corporations, industrial distributions of profits, nonfarm net interest, and capital consumption allowances are based on company data.

In addition, individual industry series are not fully comparable over time. Historical comparability is affected primarily by two factors. First, the composition of industries may change because of changes in the SIC basis that is used for the estimates. This factor affects estimates based on establishment data and on company data.

Second, historical comparability is affected because the industrial classification of the same establishment or company may change over time. This factor affects company-based estimates much more than establishment-based estimates. The classification of a company may change as a result of the following: Shifts in the

level of consolidation of entities for which company reports are filed; mergers and acquisitions; and other shifts in principal activities, especially for large diversified firms.

In addition to the SIC industrial distributions of private activities, some NIPA tables show the following special SIC groupings, the titles of which correspond to the 1987 SIC:

Financial industries consists of the following SIC industries: Depository institutions, nondepository institutions, security and commodity brokers, insurance carriers, regulated investment companies, small business investment companies, and real estate investment trusts.³³

Nonfinancial industries consists of all other private industries.

Goods-producing industries consists of the following SIC divisions: Agriculture, forestry, and fishing; mining; construction; and manufacturing.

Distributive industries consists of the following SIC divisions: Transportation (excluding the U.S. Postal Service); communications; electric, gas, and sanitary services; wholesale trade; and retail trade.

Service industries consists of the rest-of-the-world sector and the following SIC divisions: Finance, insurance, and real estate; and services.

33. Regulated investment companies, small business investment companies, and real estate investment trusts are included in the SIC classification "holding and other investment offices" and are not shown separately in the NIPA tables.

The Presentation of the NIPA's

This section describes the release schedule for the NIPA estimates, the publication of the NIPA tables, and additional presentations of NIPA and NIPA-related estimates.³⁴

Release schedule

For GDP and most other NIPA series, quarterly estimates are released on the following schedule: "Advance" estimates are released near the end of the first month after the end of the quarter; as more detailed and more comprehensive data become available, "preliminary" and "final" estimates are released near the end of the second and third months, respectively.

For gross national product, gross domestic income,

national income, corporate profits, and net interest, "advance" estimates are not prepared, because of a lag in the availability of source data. Except for the fourth-quarter estimates, the initial estimates for these series are released with the preliminary GDP estimates, and the revised estimates are released with the final GDP estimates. For the fourth quarter, these estimates are released only with the final GDP estimates.

Monthly estimates of personal income and outlays are released near the end of the month following the reference month; estimates for the preceding 2 to 4 months are subject to revision at that time.

Annual revisions of the NIPA's are usually carried out each summer and cover the months and quarters of the most recent calendar year and of the 2 preceding years. These revisions are timed to incorporate newly

34. For additional details on the availability of BEA's products and services, see BEA's Web site at <www.bea.doc.gov>.

available major annual source data.³⁵

Comprehensive revisions are carried out at about 5-year intervals. They incorporate definitional, statistical, and presentational improvements (see the introduction on page M–1).

Publication of the NIPA tables

Tables that present the NIPA estimates appear each month under “National Data” in the section “BEA Current and Historical Data” in the *SURVEY OF CURRENT BUSINESS*.³⁶ The full set of NIPA tables now consists of 148 tables that present annual, quarterly, and monthly estimates. These tables are grouped into two summary tables (S.1 and S.2) and nine other categories:

1. National Product and Income
2. Personal Income and Outlays
3. Government Current Receipts and Expenditures
4. Foreign Transactions
5. Saving and Investment
6. Income and Employment by Industry
7. Quantity and Price Indexes
8. Supplemental Tables
9. Seasonally Unadjusted Estimates

Categories 1–5 are presented in volume 1 of this publication, and categories 6–9 are presented in volume 2.

The NIPA tables are numbered as follows: The number (or letter S) preceding the period is the category number, and the number following the period indicates the specific table in that category; for example, table 2.2 is the second table in the second category “Personal Income and Outlays.” For some tables, a letter suffix following the table number indicates that there are different versions of the table for different time periods; for example, in this publication, table 4.5A shows the relation of foreign transactions in the NIPAs to the corresponding items in the international transactions accounts for the period 1946–85, and table 4.5B shows the same relation (with additional detail) for the period 1986–97.

Most of the full set of NIPA tables are published in the issues of the *SURVEY* that describe the annual and comprehensive revisions (for example, see the August 2001 *SURVEY*); the remaining tables are published in subsequent months. In addition, a set of “Selected NIPA Tables” is published monthly in the *SURVEY*; this

set presents the estimates for the most recent 5 or 6 quarters and the most recent 2 years. The selected set comprises the 2 summary tables and 59 tables from the first eight NIPA categories (seasonally unadjusted estimates in the last category are compiled only once a year and thus are not included in the selected set of tables). Because the numbering system used for the full set of tables is retained in the selected set, gaps occur in the numbering of the selected tables.

A note preceding the NIPA tables indicates information on the vintage of the estimates. In general, the NIPA tables in the *SURVEY* present estimates for the most recent 2–4 years. Historical annual and quarterly estimates for summary NIPA series are presented annually in the *SURVEY* and cover the following: Current- and chained-dollar GDP for most of the components in NIPA tables 1.1 and 1.2 and for final sales of domestic product and gross national product; NIPA chain-type quantity and price indexes and implicit price deflators; and most of the major components of national income and personal income in NIPA tables 1.14 and 2.1. For example, these estimates were published as “GDP and Other Major NIPA Series, 1929–2001:I” in the August 2001 *SURVEY*. In addition, historical annual and quarterly estimates for the major NIPA aggregates are published monthly in table C.1 in the “BEA Current and Historical Data” section of the *SURVEY*.

In the table of contents, the frequency of the estimate and the time period covered are given for each table. In volume 2, the tables are followed by the “Index to the NIPA Tables,” which identifies the NIPA table (or tables) for each NIPA series and each topic covered by the NIPAs and which includes cross-references for commonly used business and economic terms to the appropriate NIPA item.

Other presentations of NIPA estimates and NIPA-related estimates

The *SURVEY* also presents the following NIPA and NIPA-related estimates that do not fit neatly into the system or publication schedule for the standard NIPA presentation.

“Gross Domestic Product by Industry” presents current-dollar and chained-dollar estimates of gross domestic product by industry, which is the contribution of each industry—including government—to GDP. Estimates for GDP by industry for 1947–98 were published in the June 2000 *SURVEY*, and revised and new estimates for 1997–99 were published in the December 2000 *SURVEY*.

35. For a discussion of the most recent annual revision of the NIPAs, see the article in the August 2001 *SURVEY*.

36. The NIPA estimates are first published in news releases, which are available to the public in a variety of forms; for details, see the box “Data Availability.”

“Reconciliation Tables” in appendix A of the “BEA Current and Historical Data” section presents tables that reconcile NIPA estimates with related series and that provide analytically useful extensions of the NIPA estimates. At present, tables in this section show the reconciliation of relevant NIPA series with related series in the international transactions accounts and the reconciliation of BEA compensation with Bureau of Labor Statistics earnings.

“Real Inventories, Sales, and Inventory-Sales Ratios for Manufacturing and Trade”—usually published in the January, April, July, and October issues of the SURVEY—shows quarterly and monthly estimates for these series and quarterly and monthly inventories for manufacturing by stage of fabrication. Historical estimates for these series, quarterly for 1977 forward, were published in the January 2000 SURVEY, and revised and new estimates for 1997 forward will be published in the October 2001 SURVEY. Estimates for 1959 forward are available electronically on BEA’s Web site (see the box “Data Availability”).

“Fixed Assets and Consumer Durable Goods”—usually published in the September issue of the SURVEY—shows annual estimates of stocks for private fixed assets, government-owned fixed assets, and durable goods owned by consumers. Revised estimates for 1929–98 were published in the April 2000 SURVEY and were updated to 1999 in the September 2000 SURVEY. (The forthcoming publication *Fixed Assets and Consumer Durable Goods in the United States, 1925–97* will present the estimates described above and additional estimates by industry and by type of asset for net stocks, consumption of fixed capital, investment, and average age of net stocks.) Estimates for 1925 forward are available electronically on BEA’s Web site (see the box “Data Availability”).

“Selected Monthly Estimates” for personal income by type of income and for the disposition of personal income, including PCE, are published in tables B.1 and B.2 in the “BEA Current and Historical Data” section of the SURVEY. These estimates are also published annually in NIPA tables 2.8–2.11, and the estimates for the most recent months appear in the personal-income-and-outlays news release.

“Source Data and Assumptions” shows the source data and the BEA assumptions for missing key source data that are used to prepare the advance estimates of

GDP. This information is available at the time of the news release and is included in the “Business Situation” in the SURVEY that present the advance estimates.³⁷

“Reliability of the GDP Estimates” covers several articles that assess the reliability of the current quarterly estimates, which consist of the advance, preliminary, and final estimates, by comparing them with the “latest” estimates, which reflect the results of both annual and comprehensive revisions. The most recent study, which was conducted in 1998 (before the 1999 comprehensive revision and the 2000 and 2001 annual revisions), found that the current quarterly estimates correctly indicated the direction of change 98 percent of the time, correctly indicated the acceleration or deceleration of aggregate economic activity about three-fourths of the time, and successfully identified four of the five cyclical peaks since the beginning of 1969.³⁸

37. Additional information about source data and assumptions is also available on BEA’s and STAT–USA’s Web sites; see the box below.

38. See Bruce T. Grimm and Robert P. Parker, “Reliability of the Quarterly and Annual Estimates of GDP and Gross Domestic Income,” SURVEY 78 (December 1998): 12–21.

Data Availability

Most NIPA estimates are available on BEA’s Web site at <www.bea.doc.gov> within minutes after their official news release. The Web site provides summary estimates from the national, industry, regional, and international accounts, articles from the monthly SURVEY OF CURRENT BUSINESS, and other information about all aspects of BEA’s work.

In addition, STAT–USA maintains an Internet site that contains a range of economic information from many Federal statistical agencies, including BEA. To subscribe or for more information, go to <www.stat-usa.gov>, or call (202) 482–1986.

BEA also prepares recorded telephone messages that summarize key estimates immediately after they are released: For gross domestic product, call (202) 606–5306; for personal income and outlays, call (202) 606–5303; for U.S. international transactions, call (202) 606–5362.

The NIPA estimates are also available on diskettes. For more information, see the Catalog of Products on our Web site, or call the BEA Order Desk at 1–800–704–0415 (outside the United States, call (202) 606–9666).

Statistical Conventions Used for the NIPA Estimates

Most of the NIPA estimates are presented in current dollars. Changes in current-dollar estimates measure the changes in the market values of goods or services that are produced or sold in the economy. For many purposes, it is necessary to decompose these changes into price and quantity components. Prices are expressed as index numbers with the reference year—at present, the year 1996—equal to 100. Quantities, or “real” measures, are expressed as index numbers with the reference year (1996) equal to 100; for selected series, they are also expressed in chained (1996) dollars. (For further details, see the section “Real Output and Related Measures.”)

Seasonal adjustment

Quarterly and monthly NIPA estimates are seasonally adjusted at the detailed series level when the series demonstrate statistically significant seasonal patterns. For most of the series that are seasonally adjusted by the source agency, BEA adopts the corresponding seasonal adjustment factors. Seasonal adjustment removes from the time series the average effect of variations that normally occur at about the same time and in about the same magnitude each year—for example, weather and holidays. After seasonal adjustment, cyclical and other short-term changes in the

economy stand out more clearly.

Annual rates

Quarterly and monthly NIPA estimates in current and chained dollars are presented at annual rates, which show the value that would be registered if the rate of activity measured for a quarter or a month were maintained for a full year. Annual rates are used so that periods of different lengths—for example, quarters and years—may be easily compared. These annual rates are determined simply by multiplying the estimated rate of activity by 4 (for quarterly data) or by 12 (for monthly data).

Percent changes in the estimates are also expressed at annual rates. Calculating these changes requires a variant of the compound interest formula,

$$r = \left[\left(\frac{GDP_t}{GDP_0} \right)^{\frac{m}{n}} - 1 \right] \times 100$$

where r is the percent change at an annual rate, GDP_t is the level of activity in the later period, GDP_0 is the level of activity in the earlier period, m is the periodicity of the data (for example, 1 for annual data, 4 for quarterly data, or 12 for monthly data), and n is the number of periods between the earlier and later periods (that is, $t-0$).