Concepts and Methods of the U.S. National Income and Product Accounts

(Chapters 1–13)

December 2020

Preface

The "NIPA Handbook" begins with introductory chapters that describe the fundamental concepts, definitions, classifications, and accounting framework that underlie the national income and product accounts (NIPAs) of the United States and the general sources and methods that are used to prepare the NIPA estimates. It continues with separate chapters that describe the sources and methods that are used to prepare the expenditure and income components of the accounts and presents an appendix that defines each entry in the seven summary NIPA accounts and a glossary of terms that are associated with the NIPAs. The Handbook is intended to be a living reference that can be updated to reflect changes in concepts or methodology as they are introduced into the NIPAs.

This release of the NIPA Handbook updates the existing chapters to reflect the 2020 annual update of the. Additional chapters will be incorporated as they become available.

Acknowledgments

Douglas R. Fox, formerly of the Bureau of Economic Analysis (BEA), planned the structure and the content this Handbook. He and **Stephanie H. McCulla** of BEA's National Economic Accounts Directorate (NEA) prepared the chapters, with major contributions from **Shelly Smith** (NEA), and **Eugene P. Seskin,** formerly of NEA. Technical expertise has been provided by the staffs of BEA's NEA and Balance of Payments Division. **Erich Strassner**, BEA's Associate Director for National Economic Accounts, and **David B. Wasshausen**, Chief of NEA's Expenditure and Income Division, along with **Brent R. Moulton**, former Associate Director for National Economic Accounts, and **Carol E. Moylan and Nicole M. Mayerhauser**, former Division Chiefs in NEA, have provided overall guidance.

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CHAPTER 1: INTRODUCTION

The U.S. national income and product accounts (NIPAs) are a set of economic accounts that provide the framework for presenting detailed measures of U.S. output and income. This chapter introduces the NIPAs by answering several basic questions about their nature and purpose.

CHAPTER 2: FUNDAMENTAL CONCEPTS

The NIPAs are based on a consistent set of concepts and definitions. This chapter establishes the type and scope of the economic activities that are covered by the NIPA measures, and it describes several of the principal NIPA measures of these activities. It then discusses the classifications used in presenting the NIPA estimates, and it describes the accounting framework that underlies the NIPAs.

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The NIPAs incorporate a vast amount of data from a variety of public and private sources. This chapter describes the principal source data that are used to prepare the current quarterly NIPA estimates, to prepare the annual revisions of the NIPAs, and to prepare the quinquennial comprehensive revisions of the NIPAs.

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Estimating methods are the steps that are taken to transform source data into estimates that are consistent with the concepts, definitions, and framework of the NIPAs. This chapter briefly describes some of the general methods that are used to prepare the current-dollar, quantity, and price estimates for the NIPAs. An appendix describes some of the statistical tools and conventions that are used in preparing and presenting the NIPA estimates.

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This glossary presents the definitions of terms that are associated with the concepts, classifications, and accounting framework of the NIPAs and with the general sources and methods that are used to prepare the NIPA estimates.

CHAPTER 1: INTRODUCTION

(Updated: May 2019)

What are the NIPAs?
How did the NIPAs originate?
How have the NIPAs evolved?
How are the NIPA estimates used?
How useful are the NIPA estimates?
How are the NIPA estimates prepared?
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What are the NIPAs?

The national income and product accounts (NIPAs) are one of the three major elements of the U.S. national economic accounts. The NIPAs present the value and composition of national output and the types of incomes generated in its production. (For information on the concepts and definitions underlying the NIPAs, see "Chapter 2: Fundamental Concepts.")

The other major elements of the U.S. national economic accounts are the industry accounts, which are also prepared by the Bureau of Economic Analysis (BEA), and the financial accounts of the United States (formerly the flow of funds accounts), which are prepared by the U.S. Board of Governors of the Federal Reserve System. The industry accounts consist of the input-output (I-O) accounts, which trace the flow of goods and services among industries in the production process and which show the value added by each industry and the detailed commodity composition of national output, and the gross domestic product (GDP) by industry accounts, which measure the contribution of each private industry and of government to GDP.[1] The financial accounts record the acquisition of nonfinancial and financial assets (and the incurrence of liabilities) throughout the U.S. economy, the sources of the funds used to acquire those assets, and the value of assets held and of liabilities owed.[2]

In addition, BEA prepares two other sets of U.S. economic accounts: the international accounts, which consist of the international transactions (balance of payments) accounts and the international investment position accounts; and the regional accounts, which consist of the estimates of GDP by state and by metropolitan area, of

[1] See Mary L. Streitwieser, "Measuring the Nation's Economy: An Industry Perspective/A Primer on BEA's Industry Accounts," and U.S. Bureau of Economic Analysis, *Concepts and Methods of the U.S. Input-Output Accounts*; both are available on BEA's website at www.bea.gov.

[2] See U.S. Board of Governors of the Federal Reserve System, *Guide to the Flow of Funds Accounts* (Board of Governors, Washington, DC, 2006); and see Albert M. Teplin, "The U.S. Flow of Funds Accounts and Their Uses," *Federal Reserve Bulletin* (July 2001): 431–441.

state personal income, and of local area personal income.[3] Finally, the U.S. Bureau of Labor Statistics prepares estimates of productivity for the U.S. economy (which are partly based on the estimates of GDP). Altogether, the system of U.S. economic accounts presents a coherent, comprehensive, and consistent picture of U.S. economic activity.

The NIPAs provide information to help answer three basic questions. First, what is the output of the economy—its size, its composition, and its use? Second, what are the sources and uses of national income? Third, what are the sources of saving, which provides for investment in future production? The NIPA estimates are presented in a set of integrated accounts that show U.S. production, income, consumption, investment, and saving. The conceptual framework of the accounts is illustrated by seven summary accounts, and detailed estimates are provided in approximately 300 supporting NIPA tables. The NIPA information is supplemented by a set of fixed-asset accounts, which show the U.S. stock of fixed assets and consumer durable goods.[4]

The NIPAs feature some of the most closely watched economic statistics that influence the decisions made by government officials, businesses, and households. Foremost among these estimates is GDP, the most widely recognized measure of the nation's production. In particular, the quarterly estimates of inflation-adjusted GDP provide the most comprehensive picture of current economic conditions in the United States. Other key NIPA estimates include the monthly estimates of personal income and outlays, which provide current information on consumer income, spending, and saving, and the quarterly estimates of corporate profits, which provide an economic measure of U.S. corporate financial performance.

How did the NIPAs originate?

Prior to the development of official statistics in the 1930s, there were only fragmentary and sometimes conflicting data on the state of the economy. This lack of comprehensive economic data hampered efforts to develop policies to combat the Great Depression. In response to this need, and in keeping with the economic identity that "income equals production," the U.S. Department of Commerce commissioned future Nobel Laureate Simon Kuznets to develop estimates of national income to serve as an indicator of both U.S. income and U.S. output.[5] He coordinated the work of a group of researchers at the National Bureau of Economic Research and of his staff at the Commerce Department, and initial estimates were presented in a 1934 report to the U.S. Senate, *National Income, 1929–32*. Shortly thereafter, work began on monthly measures

[3] For more information on BEA's international or regional estimates, go to www.bea.gov; select "Resources" and then "Methodologies."

[4] See U.S. Bureau of Economic Analysis, *Fixed Assets and Consumer Durable Goods in the United States, 1925-97*, (September 2003), available on BEA's website at www.bea.gov.

[5] The proposition that for a country as a whole, goods and services produced must equal incomes earned by its residents is precisely true only for a closed economy. In the 1930s, when statistical measures were being formulated and international flows were relatively small, the identity was retained by using a measure of production derived from labor and capital supplied by U.S. residents wherever the production takes place—that is, gross national product rather than gross domestic product.

that could track income developments more quickly. These measures of income payments to individuals were first published in 1938 and were the predecessor of BEA's personal income estimates. They revealed their usefulness immediately, as they showed that incomes had dropped 11 percent from a post-Great Depression peak in August 1937 to the recession trough in March 1938. Annual statistics could not track these developments.

Similar efforts occurred internationally. In 1928, the League of Nations held the International Conference Relating to Economic Statistics to encourage countries to develop internationally comparable official statistics. As in the United States, the Great Depression underscored the urgency of developing reliable economic measures and in 1939 the League of Nations published national income estimates for 26 countries. As with the United States' measures, the usefulness of the measures was quickly recognized.

The planning needs for a wartime economy in the United States in the early 1940s highlighted the need for a measure of national production that could answer questions that national income measures could not address, such as the tradeoffs associated with mobilizing for war. Annual estimates of "gross national expenditure," which gradually evolved to gross national product (GNP), were introduced early in 1942 to provide information about major categories of expenditures in the economy; the measure also served as a complement to the estimates of national income.[6] Over time, both the income and expenditure measures were refined and expanded. The first U.S. national income and product statistics were presented as part of a complete and consistent double-entry accounting system in the summer of 1947. The accounts presented a framework for classifying and recording the economic transactions among major sectors: households, businesses, government, and international (termed "rest of the world"). This framework placed the GNP statistics in the broader context of the economy as a whole and provided a more complete picture of how the economy works.[7]

International efforts also continued, and after the war, the League's Committee of Statistical Experts formed a Sub-Committee on National Income Statistics, which produced a report in 1947, written by Sir Richard Stone.[8] This report was the foundation of the modern-day *System of National Accounts* (SNA)—the internationally accepted guidelines for the compilation of national accounts.

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[6] Until 1991, GNP was the featured measure of U.S. production. For an explanation of the difference between GNP and GDP, see the section "Geographic coverage" in chapter 2.

[7] See Rosemary D. Marcuss and Richard E. Kane, "U.S. National Income and Product Statistics: Born of the Great Depression and World War II," *Survey* 87 (February 2007): 32–46.

[8] Sir Richard Stone subsequently won the Nobel Prize for "having made fundamental contributions to the development of systems of national accounts and hence greatly improved the basis for empirical economic analysis."

How have the NIPAs evolved?

The evolution of the NIPAs from their earliest origins in the 1930s to their current form exemplifies the balance between theoretically ideal measures, the availability of source data and other resources, and the economic questions of the day. Put another way, the NIPAs evolved, and continue to evolve, in an effort to produce the best possible measures of the economy that are at once accurate, reliable, and relevant.

The improvements BEA introduced into its accounts over the years have reflected its own experience, research and strategic planning, and the recommendations of scholars and other experts. For example, in the 1950s, there were two major reviews of the accounts, one by the National Bureau of Economic Research and another by the Conference on Research in Income and Wealth.[9] In 1971, BEA published a special volume commemorating its 50th anniversary that contained recommendations contributed by some of the country's most prominent economists.[10] Also in the 1970s, reports were prepared by the Advisory Committee on Gross National Product Data Improvement and by the Conference on Research in Income and Wealth; in 1982, the General Accounting Office reviewed quarterly GNP revisions.[11] BEA regularly conducts its own reviews; for example, in 1995, BEA began a comprehensive review of its national, international, and regional economic accounts and sought outside advice from experts; this effort was the predecessor of the advisory committee established by BEA in 2000.[12] And in 2004, BEA participated in a Conference on Research in Income and Wealth on "A New Architecture for the U.S. National Accounts," which initiated the development of a comprehensive and fully integrated set of U.S. national accounts that would be integrated with other U.S. economic statistics such as the productivity measures prepared by the Bureau of Labor Statistics and the financial accounts prepared by the Federal Reserve Board.[13]

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[9] 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 and "A Critique of the United States Income and Product Accounts," *Studies in Income and Wealth*, vol. 22. Princeton, JN: Princeton University Press, for the National Bureau of Economic Research, 1958.

[10] "The Economic Accounts of the United States: Retrospect and Prospect," *Survey* 51 (July 1971), Part II, 50th anniversary issue.

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

[12] BEA's Advisory Committee papers are available on BEA's website at www.bea.gov. See also "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): 48-55.

[13] Dale W. Jorgenson, J. Steven Landefeld, and William D. Nordhaus, eds., "A New Architecture for the U.S. National Accounts," *Studies in Income and Wealth*, vol. 66, Chicago: University of Chicago Press, for the National Bureau of Economic Research, 2006.

Since World War II, the U.S. national accounts and the SNA have continued to evolve together: BEA actively participated in the 1993 and 2008 revisions of the SNA, and as part of its mission, BEA supports the goal of international harmonization by adopting the SNA guidelines to the extent feasible. Since 1993, BEA has incorporated many improvements to the NIPAs and its other economic accounts that have resulted in increased consistency with major SNA guidelines on GDP, investment, and saving.[14]

As a result of these continuous efforts, at the end of 1999, the Commerce Department named the invention and ongoing development of the NIPAs and its marquee measure GDP as "its greatest achievement of the century."[15] The following are examples of some of the major changes that have been introduced into the NIPAs to keep them accurate and relevant in the face of a changing economy.

- In the early 1950s, BEA developed and began to publish inflation-adjusted, or "real," measures of output in response to inflation concerns that had persisted since WWII and in order to assess trends in national productivity and standards of living. Later in the same decade, BEA introduced measures of personal income by size and by state in response to similar needs for information on the composition of consumer markets. Additionally, BEA introduced quarterly measures of real GNP to meet the need for more timely data that indicated the pace of inflationary or deflationary changes.
- In the 1960s, GNP components were benchmarked to BEA's input-output accounts to better integrate the U.S. economic estimates. Interest payments to individuals were excluded from GNP to better reflect productive activity.
- In the 1970s, BEA introduced economic measures of capital consumption that were valued at replacement cost rather than historical cost to better reflect the depletion of capital assets and to enhance the picture of the Nation's productive capacity.
- In the 1980s, BEA significantly expanded its coverage of international trade in services in response to the growing size and diversity of these global transactions.
- In the 1990s, BEA introduced more accurate measures of real output and of prices, developed estimates of investments in computer software, instituted the treatment of government purchases of structures, equipment, and software as investment, and incorporated improved measures of high-tech products.
- In the early 2000s, BEA introduced improved measures of insurance and banking services, a new treatment of government as a producer of goods and services, and a new, improved format for presenting the NIPAs.
- In the late 2000s, BEA updated the classification system for personal consumption expenditures to provide more useful categories for analysis of spending by households and nonprofit institutions serving households. BEA also

[14] For more information, see Stephanie H. McCulla, Karin E. Moses, and Brent R. Moulton, "The National Income and Product Accounts and the System of National Accounts 2008: Comparison and Research Plans," *Survey* 95 (June 2015). For the latest edition of the SNA, see http://unstats.un.org/unsd/nationalaccount/SNA2008.asp

[15] "GDP: One of the Great Inventions of the 20th Century," *Survey* 80 (January 2000): 6–14.

changed the treatment of disasters to better reflect the distinctions between current and capital transactions, and events that directly affect balance sheets.

- In 2013, BEA expanded the asset boundary in the accounts by recognizing expenditures by business, government, and nonprofits institutions serving households for research and development and expenditures by private enterprises for the creation of entertainment, literary, and artistic originals as fixed investment to allow better measurement of the effects of innovation and intangible assets on the economy. BEA also began measuring pension income on an accrual basis.

In 2018, BEA completed a multi-year initiative to improve its seasonal adjustment in the NIPAs, and it introduced measures of GDP and GDI and their major components that are not seasonally adjusted. These estimates will facilitate analyses of seasonal adjustment by distinguishing movements that are attributable to underlying source data from those that are attributable to seasonal adjustment.

How are the NIPA estimates used?

The NIPAs provide government policymakers, business decision-makers, academics and other researchers, and the general public with information that enables them to follow and understand the performance of the U.S. economy. The following are among the principal uses of the NIPA estimates.

- Since their inception in the 1930s and 1940s, the NIPAs have become the mainstay of modern macroeconomic analysis. They provide comprehensive and consistent time series that can be used for measuring the long-term path of the U.S. economy, for analyzing trends and identifying factors in economic growth and productivity, and for tracking cyclical fluctuations in economic activity.

- The NIPAs provide the basis for macroeconomic forecasting models. These mathematical models are developed using historical NIPA estimates and other variables with the aim of predicting short-term economic activity or long-term economic trends.

- Key NIPA estimates serve as primary indicators of the current condition of the U.S. economy. In particular, the releases of the quarterly estimates of GDP and its components, of the quarterly estimates of corporate profits, and of the monthly estimates of personal income and personal consumption expenditures are closely anticipated and followed by Wall Street investors and analysts, the news media, and the general public.

- The NIPA estimates provide critical inputs to the formulation and execution of macroeconomic policy and to the assessment of the effects of these policies. They are used by the White House and by Congress in formulating fiscal policy and by the Federal Reserve Board in formulating monetary policy.

- The NIPA estimates are used by the White House and Congress in preparing the federal budget and tax projections.

- The NIPA estimates are used in comparisons of the U.S. economy with the economies of other nations. Comparable international statistics facilitate assessments of relative economic performance among nations, and they provide the basis for tracking and analyzing the global economy.

- Detailed NIPA estimates can be used in examining interrelationships between various sectors of the economy. For example, estimates of benefits paid under government assistance programs track flows of transfer payments from governments to households.

- The NIPA estimates are used by businesses and individuals in planning financial and investment strategies. Such planning heavily depends on the near- and long-term prospects for economic growth.

- The NIPAs are an important data source for the other national economic accounts and other economic statistics. For example, the NIPA estimates of owner-occupied housing, of motor vehicle output, and of bank-service charges are among the primary source data used in preparing the I-O accounts. In addition, the NIPA estimates are used in various analytical measures; for example, business-sector output is used as the numerator in the Bureau of Labor Statistics' estimates of productivity for the U.S. economy.

- The NIPA framework provides the basis for developing analytical tools such as satellite accounts, which are supplementary accounts that focus on a particular aspect of economic activity or on the activities of a specific sector or segment of the economy. For example, the NIPAs provide the structural and statistical basis for the travel and tourism satellite accounts.

How useful are the NIPA estimates?

The usefulness of the NIPA estimates is determined by how effective they are in meeting the above needs. This effectiveness may be summarized in terms of four characteristics: accuracy, reliability, relevance, and integrity.

Accuracy. Accuracy may be described in terms of how close the estimates come to measuring the concepts they are designed to measure. In the case of GDP, the estimate is accurate when it captures all production for final use but does not include production for intermediate use. In order to keep pace with innovations in the economy, such as the development of new online services, BEA must periodically review and update the definitions and methodologies of the NIPA aggregates and components to ensure that they represent complete and consistent estimates.

Reliability. Reliability refers to the size and frequency of revisions to the NIPA estimates. An important indicator of reliability is the effectiveness of the initial estimates of GDP in providing a useful picture of U.S. economic activity. The results of periodic studies have confirmed that the initial estimates provide a reliable indication of whether economic growth is positive or negative, whether growth is accelerating or decelerating, whether growth is high or low relative to trend, and where the economy is in relation to the business cycle.[16]

Relevance. Relevance has two dimensions. First, relevance refers to the length of time before the estimates become available. Estimates that are not available soon enough for the intended use are not relevant. However, there is an implicit tradeoff between timeliness and accuracy, so BEA has developed a release cycle for the estimates that addresses this tradeoff (see the section "Why are the NIPA estimates revised?"). Second, relevance refers to the ability of the accounts to provide summary and detailed estimates in analytical frameworks that help answer the questions being asked about the economy. Issues of relevance change as the economy changes, as policy concerns evolve, and as economic theory advances; as discussed above, BEA's accounts have evolved over time in order to maintain their relevance.

Integrity. One critical factor underlying the usefulness of the accounts is confidence on the part of users that the NIPA estimates represent a truthful picture of the economy. That is, the preparation and release of the estimates must reflect the best methods and technical judgments available, free from any political or other inappropriate influence.

In recognition of the importance of its statistics and the trust placed in their integrity, BEA strives to make its processes open and transparent and its releases objective and timely. For example, the NIPA estimates that are designated as "principal economic indicators"—GDP, personal income and outlays, and corporate profits—are prepared in accordance with Statistical Policy Directive Number 3 of the Office of Management and Budget, which provides standards for data collection, estimation, and evaluation and for the timely and orderly release of these sensitive economic statistics. BEA employs such standards in the preparation of all of its estimates.

As Alan Greenspan, former Chair of the Federal Reserve Board, stated about the national economic accounts, and specifically the estimates of GDP:

> Though these estimates have a profound influence on markets when published and are the basis for federal budget projections and political rhetoric, I do not recall a single instance when the integrity of the estimates was called into question by informed observers. This is so despite the fact that, for many of the published preliminary figures, judgmental estimates for data not yet available are made, many of which

[16] For more information, see Dennis J. Fixler, Danit Kanal, and Pao-Lin Tien, "Revisions to GDP, GDI, and Their Major Components," *Survey* 98 (January 2018).

> affect the message of the accounts. It is a testament to the professionalism of the analysts that these judgments are never assumed to be driven by political imperatives. This cannot be said of statistical operations of all countries, and I think it is fair to say that the consequent ability of people to make decisions with greater confidence in the information at their disposal has contributed, in at least a small way, to our nation's favorable economic performance.[17]

How are the NIPA estimates prepared?

The NIPA estimation process starts with identifying and obtaining source data that are appropriate as the basis for the estimates. These data largely originate from public sources, such as government surveys and administrative data, and they are supplemented by data from private sources, such as data from trade associations. (For more information, see "Chapter 3: Principal Source Data.")

Ideally, the source data for each detailed component of the NIPAs would correspond exactly to the concepts and structure of the accounts. Additionally, these data would be accurate, would have the needed coverage, would have the appropriate time of recording and valuation, and would be available quickly. In practice, the source data will never meet all of these criteria. Thus, BEA must develop estimating methods that adjust the data to the required concepts and that fill gaps in coverage and timing. (For more information, see "Chapter 4: Estimating Methods.")

Why are the NIPA estimates revised?

BEA revises the NIPA estimates for two related reasons. First, as noted earlier, the NIPAs serve a multitude of purposes, some of which require frequent and immediately available estimates and others of which require consistent, long-term time series. Second, much of the source data that BEA uses to prepare the estimates are part of statistical programs that provide, over time, more complete or otherwise better coverage—for example, monthly surveys that are superseded by an annual survey that is drawn from a larger sample or that collects more detailed information. To address this implicit tradeoff between estimates that are the most timely possible and estimates that are the most accurate possible, BEA has developed a release cycle for the NIPA estimates. This cycle progresses from current quarterly estimates, which are released soon after the end of the quarter and which are based on limited source data, to comprehensive-update estimates, which are released about every 5 years and which incorporate the most extensive source data available.

For GDP and most other NIPA series, the set of three current 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. Most of these estimates are based on initial data

[17] "GDP: One of the Great Inventions of the 20th Century," 13.

from monthly surveys for either 2 or 3 months of the quarter; where source data are not yet available, the estimates are generally based on previous trends and judgment (see the box "Source Data and Key Assumptions for the Advance Estimates of GDP for the First Quarter of 2014" in the section "Source data for the current estimates" in chapter 3).[18]

"Second" and "third" quarterly estimates are released near the end of the second and third months, respectively; these estimates incorporate new and revised data from the monthly surveys and other monthly and quarterly source data that have subsequently become available. The current quarterly estimates provide the first look at the path of U.S. economic activity.[19]

Annual updates of the NIPAs are usually carried out each summer. These updates incorporate source data that are based on more extensive annual surveys, on annual data from other sources, and on later revisions to the monthly and quarterly source data, and they generally cover the 5 previous calendar years.[20] These revised NIPA estimates improve the quality of the picture of U.S. economic activity, though the overall picture is generally similar to that shown by the current quarterly estimates.

Comprehensive updates are carried out at about 5-year intervals and may result in revisions that extend back for many years.[21] These estimates incorporate the best available source data, such as data from the quinquennial U.S. Economic Census. Comprehensive updates also provide the opportunity to make definitional, statistical, and presentational changes that improve and modernize the accounts to keep pace with the ever-changing U.S. economy. Thus, these NIPA estimates represent the most accurate and relevant picture of U.S. economic activity.

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[18] Information on the assumptions used for unavailable source data is provided in a technical note that is posted with the GDP news release on BEA's website. Within a few days after the release, a detailed "Key Source Data and Assumptions" file is posted on the website. Additionally, in the middle of each month, an analysis of the current quarterly estimate of GDP and related series, including information on key source data and assumptions, is made available in the *Survey of Current Business* article "GDP and the Economy."

[19] Unless noted otherwise, annual data are presented on a calendar-year basis (i.e., covering January through December). Quarter data are also presented on a calendar basis (i.e., the first quarter (Q1) covers January, February, and March; Q2 covers April, May, and June; Q3 covers July, August, and September; and Q4 covers October, November, and December).

[20] As part of the 2018 comprehensive update of the NIPAs, BEA changed the typical open period for annual updates of the NIPAs from 3 to 5 years. As part of the "flexible" approach to annual updates that BEA introduced in 2010, the open period may be extended beyond 5 years to allow for the incorporation of improvements in methodology. See Pamela A. Kelly, Stephanie H. McCulla, and David B. Wasshausen, "Improved Estimates of the National Income and Product Accounts: Results of the 2018 Comprehensive Update," *Survey* 98 (September 2018) and "BEA Briefing: Improving BEA's Accounts Through Flexible Annual Revisions," *Survey* 88 (June 2008): 29–32.

[21] The following is a list of the 14 NIPA comprehensive updates to date: July 1947, July 1951, July 1954, July 1958, August 1965, January 1976, December 1980, December 1985, December 1991, January 1996, October 1999, December 2003, July 2009, July 2013, and July 2018.

Where are the NIPA estimates available?

Information on the NIPA estimates is provided in BEA news releases, in BEA's monthly journal, the *Survey of Current Business*, and on BEA's website at www.bea.gov. News releases provide the earliest information on the current quarterly NIPA estimates and the annual and comprehensive revisions of the NIPAs. These releases, which contain a brief description of the estimates and summary data tables, are posted on BEA's website by 8:30 on the morning of the release in accordance with a previously published schedule.

The most comprehensive source of the latest vintage of NIPA data is BEA's website presentation of the entire set of NIPA tables, which is updated soon after the news release is posted. The website provides the estimates in an interactive environment that enables users to view and download specified tables for selected time spans and in a variety of formats.[22] In addition, the website provides descriptions of the methodologies underlying the estimates and release schedules for the estimates, as well as articles and working papers that describe BEA's current research. Users can be notified via e-mail, RSS feeds, and Twitter accounts of new data releases.

The current NIPA estimates are also discussed each month in the article "GDP and the Economy" in the *Survey* and are presented in a set of selected NIPA tables. The annual updates are described in an article that is generally included in the August issue, which also includes most of the NIPA tables for the most recent time period. The results of the comprehensive update, articles that explain changes in definitions, methodologies, and presentations made in connection with the comprehensive update, and articles on other topics related to the NIPAs are published periodically.

The presentation of the NIPA tables is organized to group tables with similar purposes by section. For example, most government sector tables are shown in section 3. To assist users in identifying the type of estimate in a table, BEA developed a table-numbering system that highlights the type of estimate (such as current dollars, quantity indexes, and percent changes) in the table. The system is outlined below.

Table numbers are in the format "X.Y.Z." where "X" indicates the NIPA table section, "Y" indicates the table number in the section, and "Z" indicates the type of estimate presented.

The table sections are numbered as follows:

1. Domestic Product and Income
2. Personal Income and Outlays
3. Government Current Receipts and Expenditures
4. Foreign Transactions
5. Saving and Investment

[22] Go to www.bea.gov, and click on "Tools" and then on "Interactive Data." Interactive tables for BEA's international, regional and industry economic accounts are also available on the website.

6. Income and Employment by Industry
7. Supplemental Tables
8. Not Seasonally Adjusted

The table numbers within each section are numbered sequentially. The types of estimates are numbered as follows:

1. Percent change from preceding period in real estimates (most at annual rates)
2. Contributions to percent change in real estimates
3. Real estimates, quantity indexes
4. Price indexes
5. Current dollars
6. Real estimates, chained dollars
7. Percent change from preceding period in prices
8. Contributions to percent change in prices
9. Implicit price deflators
10. Percentage shares of GDP
11. Percent change from quarter one year ago (available only for real GDP)

For example, GDP is presented in table group 1.1; the current-dollar estimates are presented in table 1.1.5, and the chained-dollar estimates are presented in table 1.1.6. The tables that present estimates that are only available in current dollars use only the first two terms of the numbering system. For example, the table "Government Current Receipts and Expenditures" is numbered 3.1.

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, table 4.3A 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 4.3B shows the same relation (with additional detail) beginning with 1986.

An "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, is available on BEA's website.

CHAPTER 2: FUNDAMENTAL CONCEPTS

(Updated: December 2020)

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Scope of the Estimates

Production boundary

One of the fundamental questions that must be addressed in preparing the national economic accounts is how to define the production boundary—that is, what parts of the myriad human activities are to be included in or excluded from the measure of the economy's production. According to the international *System of National Accounts* (SNA), "Economic production may be defined as an activity carried out under the control and responsibility of an institutional unit that uses inputs of labour, capital, and goods and services to produce outputs of goods or services. There must be an institutional unit that assumes responsibility for the process of production and owns any resulting goods or knowledge-capturing products produced or is entitled to be paid, or otherwise compensated, for the change-effecting or margin services provided."[1]

[1] Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and the World Bank, *System of National Accounts 2008*: 6.24 at http://unstats.un.org/unsd/nationalaccount/SNA2008.asp.

Under this definition, certain natural processes may be included in or excluded from production, depending upon whether they are under the ownership or control of an entity in the economy. For example, the growth of trees in an uncultivated forest is not included in production, but the harvesting of the trees from that forest is included.

The general definition of the production boundary may then be restricted by functional considerations. In the SNA (and in the U.S. accounts), certain household activities—such as housework, do-it-yourself projects, and care of family members—are excluded, partly because by nature these activities tend to be self-contained and have limited impact on the rest of the economy and because their inclusion would affect the usefulness of the accounts for long-standing analytical purposes, such as business cycle analysis.[2]

In the U.S. economic accounts, the production boundary is further restricted by practical considerations about whether the productive activity can be accurately valued or measured. For example, illegal activities, such as gambling and prostitution in some states, should in principle be included in measures of production. However, these activities are excluded from the U.S. accounts because they are by their very nature conducted out of sight of public scrutiny and so data are not available to measure them.

Asset boundary

In general, the boundary for assets in the U.S. economic accounts is comparable to that for production. According to the SNA, assets "are entities that must be owned by some unit, or units, and from which economic benefits are derived by their owner(s) by holding or using them over a period of time."[3] Economic assets may be either financial assets or nonfinancial assets. Financial assets consist of all financial claims—that is, the payment or series of payments due to a creditor by a debtor under the terms of a liability—shares or other equity in corporations plus gold bullion held by monetary authorities as a reserve asset.[4] These assets are covered in the financial accounts of the United States, which are maintained by the Federal Reserve Board.

Two broad categories of nonfinancial assets are identified. *Produced assets* are assets that have come into existence as a result of a production process. The three types of produced assets are the following: fixed assets, inventories, and valuables such as precious metals that are primarily held as stores of value. *Nonproduced assets* are assets that arise from means other than a production process; a primary example is naturally occurring resources, such as mineral deposits and uncultivated forests.[5]

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[2] SNA 2008: 6.28–6.29. See also Benjamin Bridgeman, "Accounting for Household Production in the National Accounts: An Update, 1965-2014," *Survey of Current Business* 96 (February 2016).
[3] SNA 2008: 1.46.
[4] SNA 2008: 11.7–11.8.
[5] BEA does not prepare estimates of the stocks of nonproduced assets, though it does prepare estimates of net purchases and sales of these assets. However, in the mid-1990s, BEA developed an analytical framework for a set of environmental accounts along with prototype estimates for the value of the stocks of

At present, BEA prepares estimates of capital stocks for private and government fixed assets, for inventories owned by private business, and for consumer durable goods (which are included in BEA's fixed assets and consumer durable goods accounts).[6]

- Fixed assets are produced assets that are used repeatedly, or continuously, in the processes of production for more than 1 year. BEA's estimates of fixed assets cover structures, equipment, and intellectual property products, but not cultivated assets such as livestock or orchards. The acquisition of fixed assets by private business is included in the NIPA measure "gross private domestic investment," and the acquisition of fixed assets by government is included in the NIPA measure "government consumption expenditures and gross investment." The depreciation of fixed assets—that is, the decline in their value due to physical deterioration, normal obsolescence, and accidental damage except that caused by a catastrophic event—is captured in the NIPA measure "consumption of fixed capital."[7]
- The stock of private inventories consists of materials and supplies, work in process, finished goods, and goods held for resale. The change in private inventories is included in the NIPA measure "gross private domestic investment."
- Consumer durable goods are tangible commodities purchased by consumers that can be used repeatedly or continuously for a prolonged period (for example, motor vehicles). Purchases of these goods are included in the NIPA measure "personal consumption expenditures."

Thus, in the NIPAs, acquisitions of fixed assets by private business and by government are treated as investment, but acquisitions of consumer durable goods by households are treated as consumption expenditures rather than as investment.[8]

Sometimes, the asset boundary may change as a result of changes in definition or in the ability to measure or value an asset. For example, in the 2013 comprehensive update of the NIPAs, BEA introduced two major changes that broadened the definition of fixed investment and thus expanded the boundary of its capital stock estimates. First, BEA began treating expenditures by business, government, and nonprofit institutions serving households for research and development as fixed investment. Second, BEA began treating expenditures by business and nonprofit institutions serving households on entertainment, literary, and other artistic originals as fixed investment. These changes recognize that these intangible assets have ownership rights, are long-lasting, and are

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mineral resources. See "Integrated Economic and Environmental Satellite Accounts," *Survey* 74 (April 1994): 33–49; and "Accounting for Mineral Resources: Issues and BEA's Initial Estimates," *Survey* 74 (April 1994): 50–72.

[6] See "Fixed Assets," in BEA's "Interactive Data," at www.bea.gov.

[7] In the 2009 comprehensive update, BEA introduced a new treatment of disasters in which the value of irreparable damage to, or the destruction of, fixed assets is no longer recorded as consumption of fixed capital; see Eugene P. Seskin and Shelly Smith, "Preview of the 2009 Comprehensive Revision of the NIPAs: Changes in Definitions and Presentations," *Survey* 89 (March 2009): 10-27.

[8] However, estimates of the stocks of consumer durables are included in household balance sheets in the Federal Reserve Board's financial accounts of the United States as well as in BEA's capital stock estimates.

used in the production process. Private investment in research and development and in entertainment originals, along with that in software (which has been treated as a fixed asset since the 1999 comprehensive NIPA revision), is now shown in the NIPAs in the subcategory "intellectual property products" in nonresidential fixed investment. Similarly, government investment in research and development, along with that in software, is shown in "intellectual property products" in gross government fixed investment.

Also as part of the 2013 comprehensive update, BEA began recognizing as capital investment *all* of the nonfinancial ownership transfer costs that are associated with the purchase of a residential asset. These costs include title insurance; title, abstract, and attorney fees; payments for state and local government documentary and stamp taxes; and payments for surveys and engineering services; as well as the previously capitalized brokers' commissions on the sale of residential structures.[9]

Market and nonmarket output

The output that is included in the economic accounts is classified as "market," "produced for own use," or "nonmarket." Most production and distribution takes place within the market economy—that is, goods and services are produced for sale at prices that are "economically significant."[10] Thus, the current market price of the produced good or service provides a rational and viable basis for valuing this production.

Output for own final use consists of goods and services that are retained by the owners of the enterprises that produced them. Such output includes food produced on farms for own consumption, special tools produced by engineering firms for own use, and specialized software developed or improved in-house rather than purchasing custom-made software from a software development company. Goods or services produced for own final use are valued at the market prices of similar products or by their costs of production.[11]

Nonmarket output consists of goods and of individual or collective services that are produced by nonprofit institutions and by government that are supplied for free or at prices that are not economically significant. Individual services, such as education and health services, are provided at below-market prices as a matter of social or economic policy. Collective services, such as maintenance of law and order and protection of the environment, are provided for the benefit of the public as a whole and are financed out of funds other than receipts from sales. The values of the nonmarket output of nonprofits and of government are estimated based on the costs of production.[12]

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[9] For more information, see "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts: Changes in Definitions and Presentations," *Survey* 93 (March 2013): 13–39.
[10] Prices are "economically significant" when they have a significant influence on the amounts the producers are willing to supply and on the amounts the purchasers are willing to buy; see SNA 2008: 6.95.
[11] See SNA 2008: 6.114, 6.124–6.125.
[12] See SNA 2008: 6.128–6.129.

In the NIPAs, a number of *imputations* for own-use and nonmarket transactions are made in order to include in the accounts the value of certain goods and services that have no observable price and are often not associated with any observable transaction.[13] Additionally, imputations keep the accounts invariant to how certain activities are carried out (for example, an employee may be paid either in cash or in kind).[14] Both a measure of production and the incomes associated with that production are imputed (for example, the imputation for food furnished to employees is included in PCE and in personal income).

The largest NIPA imputation is that made to approximate the value of the services provided by owner-occupied housing. This imputation is made so that the treatment of owner-occupied housing in the accounts is comparable to that for tenant-occupied housing (which is valued by rent paid), thereby keeping GDP invariant as to whether a house is owned or rented. In the NIPAs, the purchase of a new house (excluding the value of the unimproved land) is treated as an investment, the ownership of the home is treated as a productive enterprise, and a service is assumed to flow, over its economic life, from the house to the occupant. For the homeowner, the value of this service is measured as the income the homeowner could have received if the house had been rented to a tenant.

Another large imputation is that made to account for services (such as checking-account maintenance and loan services to borrowers) provided by banks and other financial institutions either without charge or for a small fee that does not reflect the entire value of the service. For the depositor, this "imputed interest" is measured as the difference between the interest paid by the bank and the interest that the depositor could have earned by investing in "safe" government securities (referred to as the "reference rate"). For the borrower, it is measured as the difference between the interest charged by the bank and the interest the bank could have earned by investing in those government securities.[15]

Geographic coverage

Another important consideration is the geographic boundary that defines what is included in the accounts. In the NIPAs, and in the industry accounts, the "U.S. estimates" cover the 50 states, the District of Columbia, and U.S. military installations, embassies,

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[13] The SNA reserves the term "imputation" for situations in which a transaction must be "constructed" as well as "valued." See SNA 2008: 3.75.

[14] For a complete list of the NIPA imputations, see NIPA table 7.12, "Imputations in the National Income and Product Accounts" available on BEA's website at www.bea.gov.

[15] In the 2013 comprehensive update of the NIPAs, BEA introduced improved methods for measuring the implicitly priced services provided by commercial banks (see Kyle K. Hood, "Measuring the Services of Commercial Banks in the National Income and Product Accounts: Changes in Concepts and Methods in the 2013 Comprehensive Revision," *Survey* 93 (February 2013): 8–19). In the 2018 comprehensive update, these methods were also applied to credit unions and savings institutions; see Jason W. Chute, Stephanie H. McCulla, and Shelly Smith, "Preview of the 2018 Comprehensive Revision of the National Income and Product Accounts," *Survey* 98 (April 2018).

and consulates abroad. This treatment aligns gross domestic product (GDP), the principal measure of U.S. production, with other U.S. statistics, such as population and employment. In BEA's International Transactions Accounts (ITAs), the U.S. territories, Puerto Rico, and the Northern Mariana Islands are also treated as part of the domestic economy. This geographic difference between the two sets of accounts is reconciled through a "territorial adjustment."[16]

In the NIPAs, a distinction is made between "domestic" measures and "national" measures. Domestic measures cover activities that take place within the geographic borders of the United States, while national measures cover activities that are attributable to U.S. residents.[17] Thus, domestic measures are concerned with where an activity takes place, while national measures are concerned with to whom the activity is attributed. For example, GDP measures the market value of the goods, services, and structures produced within the nation's economy in a given period, while gross national product (GNP) measures the market value of the goods, services, and structures produced by labor and property supplied by U.S. residents. GNP is equal to GDP plus income receipts from the rest of the world less income payments to the rest of the world, and it is conceptually equivalent to gross national income (though it is estimated using different source data). Thus, for an assembly plant that is owned by a Japanese auto company and located in the United States, all of its output is included in GDP, but only the portion of the value that reflects U.S. residents' labor and property is included in GNP. And, for an assembly plant that is owned by a U.S. auto company and located in Great Britain, none of its output is included in GDP, but the portion of the value that reflects U.S. residents' labor or property is included in GNP.

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[16] See NIPA table 4.3B, "Relation of Foreign Transactions in the National Income and Product Accounts to the Corresponding Items in the International Transactions Accounts," available on BEA's website at www.bea.gov. Effective with the 2009 comprehensive update, BEA includes most transactions between the U.S. government and economic agents in Guam, American Samoa, the Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands in federal government receipts and expenditures. Thus, like private transactions (such as trade in goods and services), government transactions with these areas are treated as transactions with the rest of the world. BEA's long-run goal is to make the geographic coverage in the NIPAs consistent with that in the ITAs (see Eugene P. Seskin and Shelly Smith, 10-27). See also Christina D. Hovland-Battikha and Erin M. Ludlow, "Territorial Economic Accounts for American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and the U.S. Virgin Islands," *Survey* 98 (February 2018).

[17] "U.S. residents" includes individuals, governments, business enterprises, trusts, associations, nonprofit institutions, and similar organizations 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 residing 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.

Income and saving

Some economic theorists have broadly defined income as the maximum amount that a household, or other economic unit, can consume without reducing its net worth; saving is then defined as the actual change in net worth.[18] In the NIPAs, the definition of income is narrower, reflecting the goal of measuring current production. That is, the NIPA aggregate measures of current income—gross domestic income (GDI) for example—are viewed as arising from current production, and thus they are theoretically equal to their production counterparts (GDI equals GDP). NIPA saving is measured as the portion of current income that is set aside rather than spent on consumption or related purposes.

Consequently, the NIPA measures of income and saving exclude the following items that affect net worth but are not directly associated with current production:

- Capital gains or losses, or holding gains (or losses), which reflect changes in the prices of existing assets and thus do not represent changes in the real stock of produced assets;
- Capital transfers, which reflect changes in the ownership of existing assets; and
- Events, such as natural disasters, that result in changes in the real stock of existing assets but do not reflect an economic transaction.

Thus, for example, the NIPA estimate of personal income includes ordinary dividends paid to stockholders, but it excludes the capital gains that accrue to those stockholders as a result of rising stock prices. Personal saving is equal to personal income less personal outlays and personal taxes; it may generally be viewed as the portion of personal income that is used either to provide funds to capital markets or to invest in real assets such as residences.[19]

GDP and Other Major NIPA Measures

Three ways to measure GDP

In the NIPAs, GDP is defined as the market value of the goods, services, and structures produced by the economy in a given period. Conceptually, this measure can be arrived at by three separate means: as the sum of goods and services sold to final users, as the sum of income payments and other costs incurred in the production of goods and services, and as the sum of the value added at each stage of production (chart 2.1). Although these three ways of measuring GDP are conceptually the same, their calculation may not result in identical estimates of GDP because of differences in data sources, timing, and estimation techniques.

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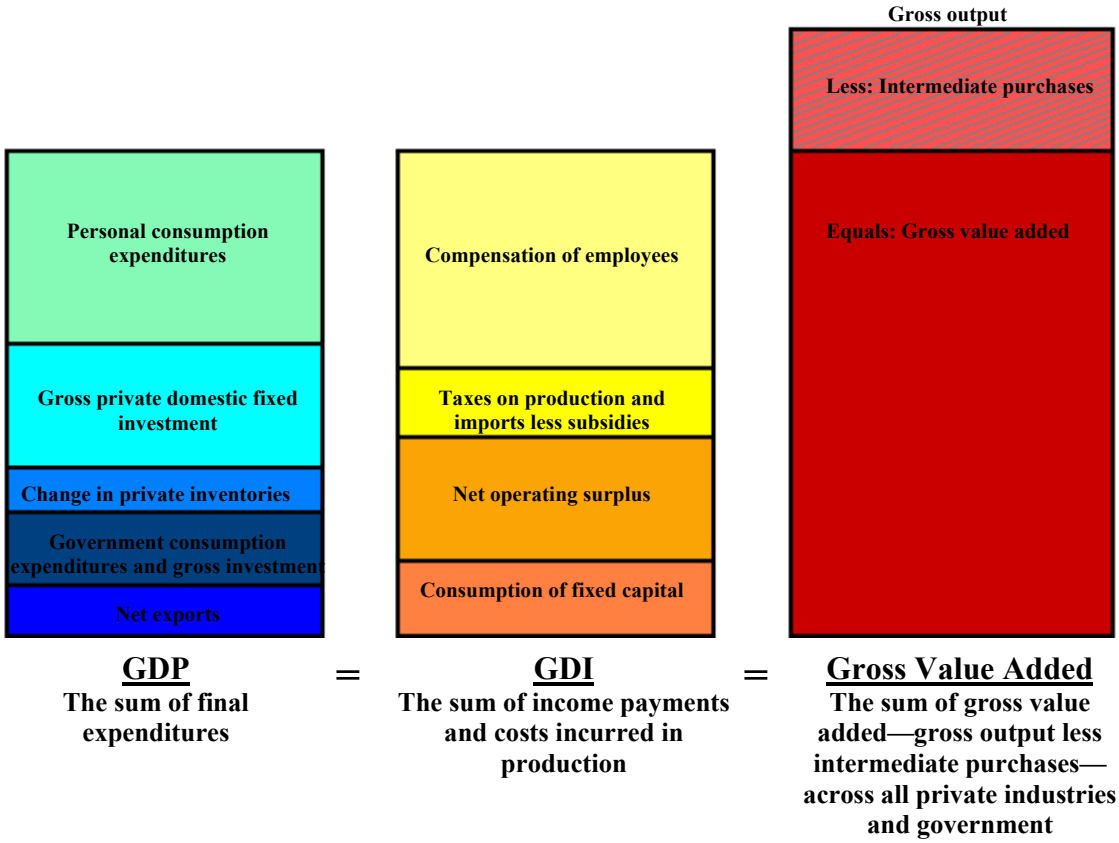
[18] Other theorists have limited this definition to expected income, a definition that would include regular capital gains but would exclude an unexpected windfall, such as a jackpot lottery payoff.
[19] See "Alternative Measures of Personal Saving," *Survey* 92 (March 2012): 23–26.

1. As the sum of goods and services sold to final users. This measure, known as the *expenditures approach*, is used to identify the goods and services purchased by persons, businesses, governments, and foreigners. It is calculated by summing the following final expenditures components.

- *Personal consumption expenditures*, which measures the value of the goods and services purchased by, or on the behalf of, persons—that is, households, nonprofit institutions that primarily serve households, private noninsured welfare funds, and private trust funds.
- *Gross private fixed investment*, which measures additions and replacements to the stock of private fixed assets without deduction of depreciation. Nonresidential fixed investment measures investment by businesses and nonprofit institutions in nonresidential structures, equipment, and intellectual property products. Residential fixed investment measures investment by businesses and households in residential structures and equipment, primarily new construction of single-family and multifamily units.
- *Change in private inventories*, which measures the value of the change in the physical volume of inventories owned by private business over a specified period, valued in the average prices of that period.
- *Net exports of goods and services*, which is calculated as exports less imports. Exports consist of goods and services that are sold, given away, or otherwise transferred by U.S. residents to foreign residents. Imports consist of goods and services that are sold, given away, or otherwise transferred by foreign residents to U.S. residents.
- *Government consumption expenditures and gross investment*, which comprises two components. Current consumption expenditures consists of the spending by general government in order to produce and provide goods and services to the public. Gross investment consists of spending by both general government and government enterprises for fixed assets (structures, equipment, and intellectual property products) that benefit the public or that assist government agencies in their productive activities.

Chart 2.1—Three Ways to Measure GDP



Thus, GDP is equal to personal consumption expenditures (PCE) plus gross private domestic fixed investment plus change in private inventories plus government consumption expenditures and gross investment plus exports minus imports. In this calculation, imports offset the non-U.S. production that is included in the other final-expenditure components. For example, PCE includes expenditures on imported cars as well on domestically produced cars; thus, in order to properly measure *domestic* production, the sales of foreign-produced cars that are included in PCE are offset by a comparable entry in the imports of these cars.[20]

2. As the sum of income payments and other costs incurred in the production of goods and services. This measure, known as the *income approach*, is used to examine the purchasing power of households and the financial status of businesses. The aggregate measure, referred to as GDI, is derived by summing the following components.

- *Compensation of employees*, which is the total remuneration of employees in return for their work. It consists of wages and salaries (primarily the monetary remuneration of employees) and supplements (employer contributions for employee pension and insurance funds and employer contributions for government social insurance).

[20] The offset covers the foreign-produced portion of the value of these sales; the domestic value-added (such as the margin provided by domestic dealerships) on imported cars is measured by the difference between the two and is included in GDP.

- *Taxes on production and imports*, which consist of taxes payable on products when they are produced, delivered, sold, transferred, or otherwise disposed of by their producers (including federal excise taxes, custom duties, and state and local sales taxes) and of other taxes on production, such as taxes on ownership of assets used in production (including local real estate taxes). These taxes do not include taxes on income.
- *Subsidies*, which are subtracted in the calculation of GDI, are payments by government agencies to private business (for example, federal subsidies to farmers) and to government enterprises (for example, federal subsidies to state and local public housing authorities) to support their current operations.
- *Net operating surplus*, which is a profits-like measure that shows the incomes earned by private and government enterprises from current production before deducting any explicit or implicit interest charges, rent, or other property incomes payable on financial assets, land, or other natural resources required to carry out production. Net operating surplus plus consumption of fixed capital is equal to *gross operating surplus*.
- *Consumption of fixed capital*, which is the NIPA measure of economic depreciation—that is, the decline in the value of the stock of assets due to physical deterioration, normal obsolescence, and accidental damage except that caused by a catastrophic event.[21]

Thus, GDI is equal to compensation of employees, plus taxes on production and imports less subsidies, plus net operating surplus, plus consumption of fixed capital. Subsidies are implicitly included in the measure of net operating surplus, but because they do not represent incomes paid or costs incurred in domestic production, they must be subtracted in calculating GDI. In the NIPAs, subsidies are shown as a subtraction from "taxes on imports and production" because they are transfers from government to business and thus, in effect, represent a negative tax by government.

3. As the sum of "value added" by all industries in the economy. This measure, known as the *value-added, or production, approach*, is used to analyze the industrial composition of U.S. output. In the input-output (I-O) accounts, value added is defined as the difference between an industry's gross output (sales or receipts plus other operating income and inventory change) and its intermediate inputs (goods and services that are used in production). When value added is aggregated across all industries in the economy, industry sales to and purchases from each other cancel out, and the remainder is industry sales to final users, or GDP.[22]

[21] In the 2009 comprehensive update, BEA introduced a new treatment of disasters in which the value of irreparable damage to, or the destruction of, fixed assets is no longer recorded as consumption of fixed capital; see Eugene P. Seskin and Shelly Smith, 10-27.
[22] In the I-O accounts, "all industries" includes government industries (such as the U. S. Postal Service) and certain "special industries" (such as owner-occupied housing).

The I-O accounts focus on gross output because they are designed to measure the productive activities and interrelationships of all industries, regardless of whether the goods and services produced by these industries are for intermediate or for final use.

Thus, gross output is sometimes referred to as "gross duplicated domestic output," because it double-counts the industry output that is purchased by other industries and used as inputs for their production. Because GDP counts only industry sales to final users, it is sometimes referred to as a "nonduplicative" measure of production in the economy.

To illustrate, a new car shipped from an auto assembly plant reflects not only the costs and profit associated with final assembly but also the costs and profit associated with all of the stages of production that preceded final assembly. At an earlier stage, the tires that were put on that car were recorded as output of the tire plant and reflected the costs and profit associated with their manufacture. Thus, in gross output, the value of the tires is counted twice—once in the value of the auto manufacturer's output and once in the value of the tire manufacturer's output. Further, including the value of the rubber and metal that were shipped to the tire plant would constitute triple counting, and so on. In contrast, in the measurement of auto-industry value added, the value of the tires shipped to the assembly plant represents an intermediate input and so is subtracted from the value of the shipments of completed cars from the assembly plant.

Because the nation's total value added is equal to its GDP and the nation's total gross output is equal to its GDP plus its total intermediate inputs, total gross output is much larger than GDP. For example, in the 2007 benchmark year, U.S. gross output was $26.2 trillion, while GDP was $14.5 trillion.

Major NIPA aggregates

In the NIPAs, the measure of domestic production that is derived as the sum of the final expenditures components is referred to as GDP, and the measure that is derived as the sum of the income payments and the costs incurred in production is referred to as GDI. These two measures and their components make up the "Domestic Income and Product Account," the first of the summary NIPA accounts (see the section "Accounting Framework"). In general, the source data for the expenditures components are considered more reliable than those for the income components, and the difference between the two measures is called the "statistical discrepancy."[23]

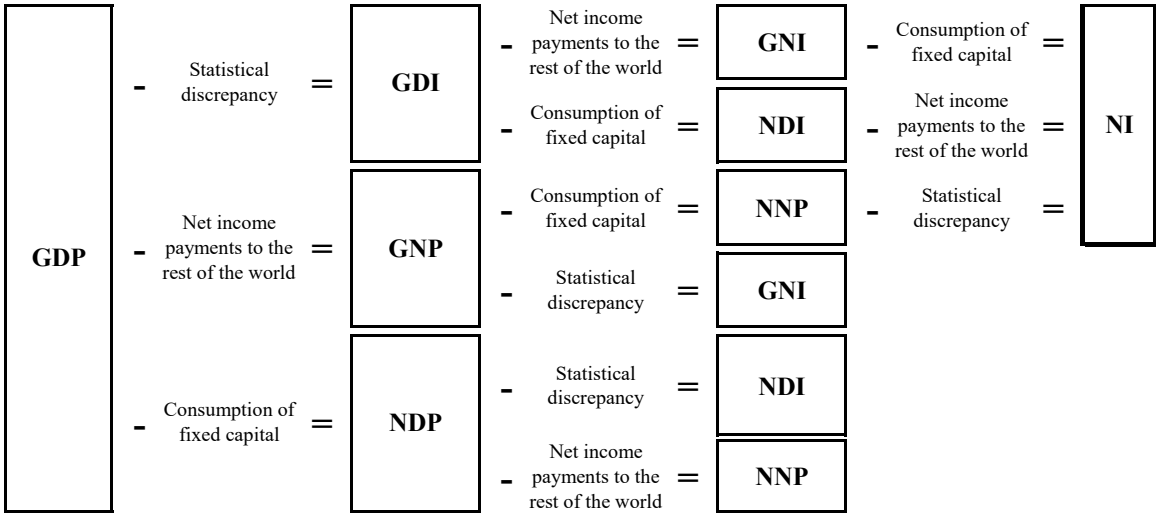
BEA also provides the equally-weighted mathematical average of GDP and GDI, as a number of reliability studies concluded that the average of these measures would better reflect the economic growth in a particular period by diminishing the known measurement inconsistencies between the two statistics, such as timing differences, gaps

[23] See Dylan G. Rassier, "The Role of Profits and Income in the Statistical Discrepancy," *Survey* 92 (February 2012): 8–22.

in underlying source data, and survey measurement errors.[24] The average of GDP and GDI is also one of the macroeconomic indicators used by the National Bureau of Economic Research's business cycle dating commission when determining turning points in the U.S. business cycle. Chart 2.2 illustrates the relationships between GDP, GDI, and several other important aggregate NIPA measures. These measures are distinguished by whether they are "product" or "income," "gross" or "net," and "domestic" or "national." In general, one moves

- from a "product" measure to an "income" measure by subtracting the statistical discrepancy,
- from a "gross" measure to a "net" measure by subtracting consumption of fixed capital (CFC), and
- from a "domestic" measure to a "national" measure by subtracting net income payments to the rest of the world (or equivalently, by adding net income receipts from the rest of the world).[25]

Chart 2.2—Relationships Between Major NIPA Measures of Income and Product



GDI Gross domestic income
GDP Gross domestic product
GNI Gross national income
GNP Gross national product
NDI Net domestic income
NDP Net domestic product
NI National income
NNP Net national product

[24] The average of GDP and GDI was introduced as part of the 2015 annual update of the NIPAs. For more on the reliability studies, see Dennis J. Fixler, Danit Kanal, and Pao-Lin Tien, "The Revisions to GDP, GDI, and Their Major Components," *Survey* 98 (January 2018) and William D. Nordhaus, "Income, Expenditures, and the 'Two Map Problem" (paper presented at the BEA Advisory Committee Meeting, Washington, DC, November 2011).

[25] Net income payments to the rest of the world is equal to current payments to the rest of the world (primarily income paid to foreign residents on investments in U.S. assets) less current receipts from the rest of the world (primarily income received by U.S. residents on investments in assets abroad).

Gross national product (GNP), which was discussed earlier in this chapter (see the section "Geographic coverage"), is equal to GDP minus net income payments to the rest of the world.

Net domestic product (NDP) is a measure of how much of the nation's output is available for consumption or for adding to the nation's wealth. It is equal to GDP minus CFC.

Gross national income (GNI) measures the costs incurred and the incomes earned in the production of GNP. It is equal to GNP minus the statistical discrepancy. It is also equal to GDI minus net income payments to the rest of the world.

Net national product (NNP) is the net market value of goods and services produced by labor and property supplied by U.S. residents (see the earlier description of GNP). It is equal to GNP minus CFC. It is also equal to NDP minus net income payments to the rest of the world.

Net domestic income (NDI) measures the costs incurred and the incomes earned in the production of NNP. It is equal to NNP minus the statistical discrepancy. It is also equal to GDI minus CFC.

National income is the sum of all net incomes earned in production (and thus it could also be termed "net national income"). It is equal to GNI minus CFC, NNP minus the statistical discrepancy, and NDI minus net income payments to the rest of the world. It is also equal to the sum of compensation of employees, proprietors' income with inventory valuation adjustment (IVA) and capital consumption adjustment (CCAdj), rental income with CCAdj, corporate profits with IVA and CCAdj, net interest and miscellaneous payments, taxes on production and imports less subsidies, business current transfer payments (net), and current surplus of government enterprises.

The following are several other important NIPA aggregates.

Personal income is the income that persons receive in return for their provision of labor, land, and capital used in current production, plus current transfer receipts less contributions for government social insurance (domestic).[26] Personal income is equal to national income minus corporate profits with IVA and CCAdj, taxes on production and imports less subsidies, contributions for government social insurance, net interest and miscellaneous payments on assets, business current transfer payments (net), and current surplus of government enterprises, plus personal income receipts on assets and personal current transfer receipts.[27]

[26] "Persons" consists of households, nonprofit institutions that primarily serve households, private noninsured welfare funds, and private trust funds.
[27] For more information, see *State Personal Income and Employment: Concepts, Data Sources, and Statistical Methods* on BEA's website at www.bea.gov.

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 equal to GDP minus net exports. It is also equal to the sum of PCE, gross private domestic investment, and government consumption expenditures and gross investment.

Final sales of domestic product is equal to GDP less change in private inventories. It is also equal to the sum of PCE, gross private fixed investment, government consumption expenditures and gross investment, and net exports of goods and services.[28]

Final sales to domestic purchasers is equal to gross domestic purchases less change in private inventories. It is also equal to the sum of PCE, gross private fixed investment, and government consumption expenditures and gross investment.

Final sales to private domestic purchasers is equal to final sales to domestic purchasers less government consumption expenditures and gross investment. It is also equal to the sum of PCE and private fixed investment. As this measure excludes the more volatile components of GDP, such as net exports and government spending, it reflects the more persistent movements in spending by consumers and businesses in the United States.[29]

Principal quantity and price measures

The market values and imputations used to measure GDP and the other NIPA estimates are in current dollars—that is, they reflect transactions in terms of their value in the periods in which they take place. Although many technical problems arise in preparing these estimates, measuring the change in current-dollar GDP from one period to the next is conceptually straightforward, because it is the actual change in spending that occurs in the economy between the two time periods.

For many analyses, it is useful to separate the changes in current-dollar GDP that are due to changes in quantity from those that are due to changes in price.[30] However, aggregate quantity change and aggregate price change cannot be observed directly in the economy. Instead, these changes must be calculated, and the calculation method is determined by analytic requirements. In the NIPAs, the changes in quantities and prices are computed from chain-type indexes that are calculated using a Fisher formula. (For a

[28] While analytically useful, the interpretation of final sales of domestic product is complicated by the fact that additions to inventories come from both domestic production and imports. Source data are not available to distinguish the portion of imported goods that flows into inventories from the portion that is sold directly, so the measure does not, strictly speaking, identify the sales from domestic product.
[29] This measure was introduced as part of the 2015 annual update of the NIPAs; see Stephanie McCulla and Shelly Smith, "Preview of the 2015 Annual Revision of the National Income and Product Accounts," *Survey* 95 (June 2015): 1-8.
[30] In this separation, changes in the quality of the goods and services provided are treated as changes in quantity; BEA uses quality-adjusted price indexes to deflate goods and services to yield quantity estimates; these indexes are described in the appendix to chapter 4 of this handbook.

discussion of the statistical methods used to prepare these measures, see "Chapter 4: Estimating Methods.")

In the NIPAs, the featured measure of growth in the U.S. economy is the *percent change in real GDP*—that is, the quantity-change measure for GDP from one period to another.[31] Thus, changes in real GDP provide a comprehensive measure of economic growth that is free of the effects of price change.

In the NIPAs, the featured measure of inflation in the U.S. economy is the *percent change in the price index for gross domestic purchases*. This index measures the prices of goods and services purchased by U.S. residents, regardless of where the goods and services were produced. It is derived from the prices of PCE, gross private domestic investment, and government consumption expenditures and gross investment. Thus, for example, an increase in the import price of a foreign-produced car would raise the prices paid by U.S. residents and thereby directly affect the price index for gross domestic purchases.[32]

Another aggregate price measure is the GDP *price index*, which measures the prices of goods and services produced in the United States. In contrast to the price index for gross domestic purchases, the GDP price index would not be directly affected by an increase in the import price of a foreign-built car, because imports are not included in GDP.

Another important NIPA price measure is the *PCE price index*, which measures the prices paid for the goods and services purchased by "persons." This index is frequently compared with the consumer price index, which is produced by the Bureau of Labor Statistics. The two indexes are similar, but there are differences in terms of coverage, weighting, and calculation.[33]

Further, BEA provides variants of the above price indexes that exclude their particularly volatile food and energy components. These variants are sometimes used to indicate the "core inflation" in the U.S. economy.

BEA publishes several aggregate measures of real income as counterparts to its aggregate measures of real production. *Real GDI* is calculated as current-dollar GDI deflated by the implicit price deflator (IPD) for GDP; *real GNI* is calculated as current-dollar GNI deflated by the IPD for GNP; and *real net domestic income* is calculated as current-dollar net domestic income deflated by the IPD for net domestic product.[34]

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[31] Until 1991, GNP was the featured measure of U.S. production; see "Gross Domestic Product as a Measure of U.S. Production," *Survey* 71 (August 1991): 8.

[32] This example assumes the entire price increase is passed on to the car buyer—that is, the wholesale or retail margins are unchanged.

[33] See Clinton P. McCully, Brian C. Moyer, and Kenneth J. Stewart, "Comparing the Consumer Price Index and the Personal Consumption Expenditures Price Index," *Survey* 87 (November 2007): 26–33.

[34] Implicit price deflators for an aggregate or component are calculated as the ratio of the current-dollar value to the corresponding chained-dollar value, multiplied by 100 (see the section "Chained-dollar measures" in chapter 4).

In addition, BEA prepares alternative measures of real GDP and real GNP that measure the real purchasing power of the income generated from the production of the goods and services by the U.S. economy. These measures, which in the NIPAs are called *command-basis GDP* and *command-basis GNP*, reflect the impact of changes in the terms of trade as well as changes in production (BEA also prepares alternative command-basis measures of NNP and NDP).[35] In calculating command-basis GDP, exports and imports of goods and services are each deflated by the price index for gross domestic purchases to yield exports on a command-basis and imports on a command basis; then, command-basis exports are added to, and command-basis imports are subtracted from, real gross domestic purchases.[36] The calculation of command-basis GNP is the same, except income receipts from the rest of the world are deflated along with exports, and income payments to the rest of the world are deflated along with imports.[37] In effect, the calculations are the same as deriving command-basis GDP (GNP) by deflating current-dollar GDP (GNP) by the price index for gross domestic purchases. Thus, the command-basis measures are alternative measures of real GDP and real GNP that reflect the prices of purchased goods and services, while the primary measures of real GDP and real GNP reflect the prices of produced goods and services.

BEA also prepares several measures that show the relationship between the prices that are received by U.S. producers and the prices that are paid by U.S. purchasers. The broadest measure, the *trading gains index*, is the ratio of the GDP price index to the price index for gross domestic purchases. An increase (decrease) in this ratio would indicate an increase (decrease) in the purchasing power of the income generated in producing GDP. Successively narrower measures specifically focus on the relationship between the prices of the U.S. goods and services that are produced for consumption by the rest of the world and the prices of the goods and services that are produced by the rest of the world for U.S. consumption. The *terms of trade index*, is the ratio of the price index for exports of goods and services to the price index for imports of goods and services; ratios for the terms of trade in goods and in nonpetroleum goods are also prepared. Movements in these trading indexes 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.

In addition, BEA provides statistical measures that supplement the current-dollar, quantity-index, and price-index measures. Foremost among these are measures of the contributions of major components to the percent change from the preceding year or

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[35] In the SNAs, these measures are referred to as real GDI and real GNI. However, as noted in the preceding paragraph, BEA uses a different method to derive those aggregates.

[36] In this case, adding and subtracting these estimates is acceptable because all three aggregates are derived using the same deflator.

[37] This methodology for calculating the command-basis aggregates was introduced in the 2010 annual update of the NIPAs; see Eugene P. Seskin and Shelly Smith, "Annual Revision of the National Income and Product Accounts," *Survey* 90 (August 2010): 21. For additional technical and historical background, see Marshall B. Reinsdorf, "Terms of Trade Effects: Theory and Measurement," *Review of Income and Wealth* 56 (June 2010): S177-S205.

quarter in real GDP, in other principal product-side aggregates, in GDP prices, and in gross domestic purchases prices. BEA also provides measures of the percentage shares of current-dollar GDP and GDI that are accounted for by their major components.

Classification

The application of common classification systems for the NIPAs, and for all of the U.S. economic accounts, is extremely important because classification provides the structure necessary to prepare and present the estimates uniformly and consistently. Further, common classifications enable users to effectively compare and analyze data across the broad spectrum of economic statistics.

In the NIPAs, the estimates of production and expenditures may be classified by sector, by type of product, and by function, while the estimates of income may be classified by industry and by legal form of organization.

Sector

The NIPAs have a "mixed" sectoring scheme under which certain entities are defined one way for production related measures and another way for income-related measures[38]. For measuring domestic production in the NIPAs, the contribution, or value added, of various institutions can be broken down into three distinct groups, or sectors—business, households and institutions, and general government (table 2.1). A fourth sector, referred to as "the rest-of-the-world," covers transactions between U. S. residents and foreign residents.

Table 2.1—Gross Value Added by Sector

Gross domestic product
Business
Nonfarm
Farm
Households and institutions
Households
Nonprofit institutions serving households
General government
Federal
State and local
Note. Adapted from NIPA table 1.3.1.

[38] For additional detail on the mixed sectoring scheme of the NIPAs, see Stephanie H. McCulla, Karin E. Moses, and Brent R. Moulton, "The National Income and Product Accounts and the System of National Accounts 2008: Comparison and Research Plans," *Survey* 95 (June 2015): 1-17.

Business: The business sector comprises all corporate and noncorporate businesses that are organized for profit, other entities that produce goods and services for sale at a price that is based on the costs of production, and certain other entities that are treated as businesses in the NIPAs. These other entities include mutual financial institutions, noninsured pension funds, cooperatives, nonprofit organizations (that is, entities classified as nonprofit by the Internal Revenue Service in determining income tax liability) that primarily serve business, federal reserve banks, federally sponsored credit agencies, and government enterprises. The gross value added of the business sector is measured as GDP less the gross value added of households and institutions and of general government.[39]

Households and institutions: The households and institutions sector comprises households (families and unrelated individuals) and nonprofit institutions serving households (NPISHs). The gross value added of households is measured by the services of owner-occupied housing and the compensation paid to domestic workers. The gross value added of NPISHs is measured by the compensation paid to the employees of these institutions, the rental value of fixed assets owned and used by these institutions, and the rental income of persons for tenant-occupied housing owned by these institutions.[40]

General government: The general government sector comprises all federal government and state and local government agencies except government enterprises. The gross value added of general government is measured as the sum of the compensation of the employees of these agencies and of their consumption of fixed capital.

For measuring domestic income, outlays, and saving, institutions are grouped into three other sectors—personal, government, and corporate (along with the fourth "rest of world" sector for limited measures of transactions in income).

Personal: The personal sector comprises households (families and unrelated individuals) and private unincorporated enterprises—that is, sole proprietorships, partnerships, and other private businesses, such as tax-exempt cooperatives.[41]

Government: The government sector comprises both general government and government agencies; while the production of the enterprises is included in the business sector, their surplus or deficit as well as their interest payments and receipts and their investments are included in the government sector. Estimates of most transactions between government enterprises and their general government owners are not provided.

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[39] Measures of gross value added for financial and for nonfinancial corporations are also shown in the NIPA tables. They are calculated based on the costs incurred and the incomes earned from production.
[40] For more information on NPISHs, see the technical note in Chapter 5 of this handbook.
[41] Owner-occupied housing is an exception; the NIPAs treat owner-occupied housing as an unincorporated enterprise, but its output is included in the household sector, rather than the business sector, while the production-related income transactions associated with housing services, such as interest payments on mortgage loans, are included in the business sector, rather than the personal sector.

Corporate: The corporate sector comprises only corporate businesses that are organized for profit; government enterprises and unincorporated businesses are classified in the household sector and government sector, respectively.

Type of product

In the NIPAs, classifications by type of product—goods, services, and structures—are presented for GDP and for the components of final sales of domestic product (table 2.2).[42]

Table 2.2—Gross Domestic Product by Major Type of Product

Gross domestic product
Final sales of domestic product
Change in private inventories
Goods
Final sales
Change in private inventories
Durable goods
Final sales
Change in private inventories
Nondurable goods
Final sales
Change in private inventories
Services
Structures
Note. Adapted from NIPA table 1.2.1.

Goods consists primarily of tangible products that can be stored or inventoried, but this category also includes certain intangibles, such as intellectual property products.

Services are products, such as medical care, that cannot be stored and are usually consumed at the place and time of their purchase. Government consumption expenditures, which are for services produced by government, are included in this category.[43] By convention, goods purchased by U.S. residents abroad are also included.

Structures are products—such as commercial buildings, highways, dams, and single-family houses—that are usually constructed at the location where they will be used and that typically have long economic lives.

[42] The North American Product Classification System (NAPCS), the commodity counterpart to the North American Industry Classification System (see the section "Industry") is an integrated and comprehensive list of products, product definitions, and product codes organized using a demand-side, market-oriented classification framework for both goods and services. For more information about the system, which has been developed by the United States, Canada, and Mexico in a series of phases, see the Census Bureau website at www.census.gov.

[43] The value of these services, most of which are not sold in the market, is measured by the cost of inputs: compensation, CFC, and purchased goods and services less own-account investment and sales to other sectors (which are reflected in other final expenditures components, such as PCE).

Function

"Functional" classifications identify the purposes or objectives for which expenditures are made. In the NIPAs, functional breakdowns of expenditures are provided for PCE and for government expenditures.

For PCE, expenditures by function are classified into the following broad categories (table 2.3).[44] These classifications are largely consistent with the SNA "Classification of Individual Consumption by Purpose" (COICOP).[45]

Table 2.3—Personal Consumption Expenditures by Function

Personal consumption expenditures
Food and beverages purchased for off-premises consumption
Clothing, footwear, and related services
Housing, utilities, and fuels
Furnishings, household equipment, and routine household maintenance
Health
Transportation
Communication
Recreation
Education
Food services and accommodations
Financial services and insurance
Other goods and services
Net foreign travel and expenditures abroad by U.S. residents
Final consumption expenditures of nonprofit institutions serving households
Note. Adapted from NIPA table 2.5.5.

The functional classifications for government are largely consistent with the SNA "Classification of the Functions of Government" (COFOG).[46] For the federal government, expenditures are classified into nine categories, and for state and local governments, expenditures are classified into eight categories (national defense is omitted) (table 2.4).

[44] This classification was introduced in the 2009 comprehensive update; see Clinton P. McCully and Teresita D. Teensma, "Preview of the 2009 Comprehensive Revision of the National Income and Product Accounts: New Classifications for Personal Consumption Expenditures," *Survey* 88 (May 2008): 6–17.
[45] McCully and Teensma, 14.
[46] See Karl Galbraith, "Government Spending by Function: A New Presentation," *Survey* 80 (June 2000): 18–23. See also Bruce E. Baker, Pamela A. Kelly, and Brooks B. Robinson, "Estimates of Real Government Consumption Expenditures and Gross Investment by Function," *Survey* 84 (October 2004): 5–10 and also see SNA 2008: 9.99.

Table 2.4—Government Consumption Expenditures and Gross Investment by Function

Government
General public service
National defense
Public order and safety
Economic affairs
Housing and community services
Health
Recreation and culture
Education
Income security
Note. Adapted from NIPA table 3.15.5.

Industry

The North American Industry Classification System (NAICS) is the official industry classification system for the United States.[47] NAICS was developed during the 1990s through a collaborative effort by the United States, Canada, and Mexico to facilitate better comparisons of the economies of the three countries.[48] Prior to the adoption of NAICS, most U.S. statistics were based on the Standard Industrial Classification (SIC).[49] The SIC system, which was initially developed in the late 1930s, was concentrated in manufacturing, which dominated the U.S. economy at that time. The switch from the SIC to NAICS provided more detailed classifications for services industries and for high-tech industries. Moreover, by organizing establishments based on their production methods rather than on the products they produced, NAICS provided a better conceptual basis for industrial classification.

NAICS was introduced into the national economic accounts in late 2002 with the release of the 1997 benchmark I-O accounts, which were based on the 1997 Economic Census. Effective with the 2003 comprehensive update, NAICS became the industry classification system for the NIPAs.

In the NIPAs, industrial distributions are presented for national income and most of its components, capital consumption allowances, employment and hours, and the change in private inventories and the stock of private inventories (see, for example, table

[47] See *North American Industry Classification System, United States, 2017*, available on the Census Bureau website at www.census..

[48] For information of the development and implementation of NAICS, see John Kort, "The North American Industry Classification System in BEA's Accounts," *Survey* 81 (May 2001): 7–13.

[49] See 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).

2.5 below).[50] For income and employment, the classification of the estimates for 1998 forward is based on NAICS; for inventories, the classification of the estimates for the first quarter of 1997 forward is based on NAICS. In general, the estimates by industry before these dates are on a SIC basis.[51]

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.

Table 2.5—National Income Without Capital Consumption Adjustment by Industry

National income without capital consumption adjustment
Domestic industries
Private industries
Agriculture, forestry, fishing, and hunting
Mining
Utilities
Construction
Manufacturing
Durable goods
Nondurable goods
Wholesale trade
Retail trade
Transportation and warehousing
Information
Finance, insurance, real estate, rental, and leasing
Professional and business services
Educational services, health care, and social assistance
Arts, entertainment, recreation, accommodation, and food services
Other services, except government
Government
Rest of the world
Note. Adapted from NIPA table 6.1D.

The industrial distributions for wages and salaries and for inventories are generally based on data collected from "establishments," while those for the other NIPA components are generally based on data collected from "companies" (also called "enterprises," or "firms"). Companies consist of one or more establishments owned by the same legal entity or group of affiliated entities. Establishments are economic units, generally at a single physical location, where business is conducted or where services or industrial operations are performed (for example a factory, mill, store, hotel, movie theater, mine, farm, airline terminal, sales office, warehouse, or central administrative

[50] An industrial distribution of fixed investment based on data collected from establishments is prepared as part of the procedure used to estimate fixed assets. For further information, see "*Fixed Assets and Consumer Durable Goods in the United States, for 1925–97,*" September 2007 on BEA's website at www.bea.gov.

[51] NAICS-based estimates for GDP by industry and for fixed assets are available for earlier periods.

office). Establishments are classified into an industry on the basis of their principal production method, and companies are classified into an industry on the basis of the principal industry of all their establishments. Because large multi-establishment companies typically contain establishments that are classified in different industries, the industrial distribution of the same economic activity on an establishment basis can differ significantly from that on a company basis. For example, the measure of corporate profits by steel-manufacturing companies will include the profits of establishments that do not manufacture steel but are part of companies that are classified as steel-manufacturing companies. Similarly, this measure will exclude the profits of establishments that manufacture steel but are part of companies that are not classified as steel-manufacturing companies.

Moreover, individual industry series are not fully comparable over time. First, the composition of industries may change because of revisions to NAICS or to the SIC. This factor affects estimates based on establishment data and on company data. Second, historical comparability may be affected by a change over time in the industrial classification of the same establishment or company. For example, the classification of a company may change as a result of shifts in the level of consolidation of entities for which company reports are filed or as a result of mergers and acquisitions. This factor affects company-based estimates much more than establishment-based estimates. As noted above, there is a break in 1998 between SIC and NAICS classifications for NIPA estimates of income and employment and in 1997 for NIPA estimates of inventories. Moreover, while the NAICS-based NIPA estimates are periodically updated to reflect the most recent NAICS categories (currently 2012), the estimates are bridged to, and largely presented on, the 1997 NAICS structure to avoid repeated changes to the NIPA presentation.

In addition, some NIPA tables show the following special industry groupings:

Financial industries consists of the NAICS industry "Finance and insurance" and of "Offices of bank holding companies" and "Offices of other holding companies" in the NAICS industry "Management of companies and enterprises." Finance and insurance consists of Federal Reserve banks; credit intermediation and related activities; securities, commodity contracts, and investments; insurance carriers and related activities; and funds, trusts, and other financial vehicles.

Nonfinancial industries consists of all other private industries.

Private goods-producing industries consists of the following NAICS divisions: agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

Private services-producing industries consists of the following NAICS divisions: utilities; wholesale trade; retail trade; transportation and warehousing; information; finance and insurance; real estate and rental and leasing; professional, scientific, and technical services; management of companies and enterprises; administrative and waste management services; educational services; health care and social assistance; arts,

entertainment, and recreation; accommodation and food services; and other services, except government.

Legal form of organization

For the domestic business sector in the NIPAs, classification by legal form of organization is shown for national income and its components. Legal forms of organization are based on IRS filing requirements for corporate business and for noncorporate business, which comprises sole proprietorships and partnerships, other private business, and government enterprises (employee compensation and current surplus of enterprises) (table 2.6).

Table 2.6—National Income by Legal Form of Organization

National income
Domestic business
Corporate business
Noncorporate business
Sole proprietorships and partnerships
Other private business
Government enterprises
Households and institutions
General government
Rest of the world
Note. Adapted from NIPA table 1.13.

Corporate business: This legal form comprises all entities required to file federal corporate tax returns, Internal Revenue Service (IRS) Form 1120 series. It includes mutual financial institutions and cooperatives subject to federal income tax, private noninsured pension funds, nonprofit institutions that primarily serve business, Federal Reserve banks, and federally sponsored credit agencies.

Sole proprietorships: This legal form comprises all entities that are required to file IRS Schedule C (Profits or Loss from Business) or Schedule F (Farm Income and Expenses) or that would be required to file if the proprietor met the filing requirements.

Partnerships: This legal form comprises all entities that are (or would be) required to file federal partnership income tax returns, IRS Form 1065 (U.S. Partnership Return of Income).

Other private business: This legal form comprises (1) all entities that are (or would be) required to report rental and royalty income on IRS Schedule E (Supplemental Income and Loss) of the individual income tax return and (2) tax-exempt cooperatives.

Government enterprises: This legal form consists of 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. For example, the U.S. Postal Service is a federal government enterprise, and public water and sewage agencies are local government enterprises.

Accounting Framework

The NIPAs consist of a set of integrated accounts that provide statistics on the output of the U.S. economy. The NIPA accounting framework is designed to provide context for these statistics, so that they are presented logically, consistently, and according to established economic-accounting principles and standards. The NIPAs are generally consistent with the SNA, which now serves as the internationally accepted set of guidelines for the compilation of national accounts.[52]

For an in-depth discussion of the conceptual framework of the NIPAs and the NIPA summary accounts and of the underlying accounting principles and common financial statements, see U.S. Bureau of Economic Analysis, *An Introduction to the National Income and Product Accounts,* Methodology Paper No. 1 (updated), September 2007.[53] The definitions of the line items that make up the seven summary accounts are presented in the appendix to this Handbook, "Summary National Income and Product Accounts."

Accounting principles

Double-entry bookkeeping is one of the most fundamental principles used in economic accounting and in financial accounting. In financial accounting, activities that affect the resources available to a business are recorded at least once as a source of financing (credit) and at least once as a use of financing (debit). Thus, double-entry bookkeeping provides a means to validate the accounting entries, because the sum of the entries on each side of an account must be equal. In national economic accounting, each transaction is recorded as a payment by one sector and as a receipt by the same sector or by another sector—for example corporate income tax is a payment by a corporation and a receipt of the government.[54] In addition to providing a means to validate entries, this

[52] See Stephanie H. McCulla, Karin E. Moses, and Brent R. Moulton, "The National Income and Product Accounts and the System of National Accounts 2008: Comparison and Research Plans," *Survey* 95 (June 2015): 1-17, and see Charles Ian Mead, Karin E. Moses, and Brent R. Moulton, "The NIPAs and the System of National Accounts," *Survey* 84 (December 2004): 17–32.
[53] "An Introduction to the National Income and Product Accounts," available at www.bea.gov.
[54] A fully articulated set of national accounts (showing payments and receipts by all sectors) actually leads to a quadruple-entry system (in which each transaction is recorded as a debit and a change in assets for one sector and as a credit and a change in assets for another sector). However, transactions are usually recorded only twice in the NIPAs because the changes in assets or liabilities that are associated with the changes in revenues or expenses are recorded in the Federal Reserve Board's flow of funds accounts.

system also provides alternative ways to calculate a measure when complete information is not available for one of the sectors.

The accrual-accounting method is another principle important to both financial and economic accounting. This method is generally used to ensure that related revenues and expenses are recorded in the same accounting period. In accrual accounting, revenues are recorded when they are earned, and expenses are recorded when they are incurred, regardless of when the cash is actually received or paid. The accrual-accounting method may be contrasted to the cash-accounting method, which records revenues when cash is received and expenses when cash is paid.

Financial accounting and economic accounting generally apply different principles in valuing transactions. In financial accounting, assets (and depreciation) are commonly valued at historical costs—that is, at the prices relevant at the time of the acquisition; subsequent changes in the value of these assets are ignored. In economic accounting, assets (and depreciation) are valued at current costs—that is, at the market prices that prevail at the time they are valued. In preparing the NIPAs, various adjustments, such as the inventory valuation adjustment and the capital consumption adjustment, are made so that the estimates will reflect current costs rather than historical costs.

Conceptual derivation of the NIPAs

The NIPAs represent consolidations of the production, the income and outlay, and the saving and investment accounts for each sector of the economy (business, households, government, and foreign). These sector accounts, in turn, represent aggregations of the accounts belonging to individual transactors in the economy, regardless of whether formal accounting statements exist explicitly for all of them.

Specifically, for each sector, the *production account* records the value of the production that is attributable to that sector and the uses of the income arising from that production. The *income and outlay account* records the sources of the sector's income, its current outlays, and its saving. The *saving and investment* account (also known as the capital account) records the sector's gross saving and gross investment, where gross investment is net acquisitions of assets less net increase in liabilities.

Chart 2.3 illustrates the relationship between the summary NIPAs and the underlying production, income and outlay, and saving and investment accounts for the sectors of the economy.

Chart 2.3—NIPA Summary Accounts

Transactions	Domestic accounts			Rest of the world
	Economic sectors			
	Business	Government	Personal	
Production	Domestic income and product account (Account 1)			Foreign transactions current account (Account 5)
Income and outlay	Private enterprise income (Account 2)	Government current receipts and expenditures (Account 4)	Personal income and outlay (Account 3)	
Saving and investment	Domestic capital account (Account 6)			Foreign transactions capital account (Account 7)

The NIPA summary "domestic income and product account" represents a consolidation of the production accounts for business, households and institutions, and general government.

The income and outlay accounts for the sectors are shown in three separate summary accounts. Income and outlays for the personal sector, including income accruing to unincorporated businesses, are shown in the "personal income and outlay account." Income and outlays for the government sector, including income accruing to government enterprises, are shown in the "government current receipts and expenditures account. Income and outlays for business enterprises and for households and institutions in their role as producers are shown in the "private enterprise income account." In order to provide analytically useful aggregates associated with all private business, the coverage in this account includes the income and outlays of unincorporated businesses as well as those of corporate businesses.

The saving and investment accounts are consolidated into a single summary "domestic capital account." For saving, a breakdown by sector is shown for corporate, personal, and government saving. For investment, because of source data limitations, the breakdown is shown for private fixed and inventory investment and for government fixed investment.

The transactions for the foreign (or rest-of-the-world) "sector"—that is, transactions between U.S. residents and foreign residents—are shown separately in two summary accounts. Current receipts and expenditures, such as exports and imports of goods and services, are shown in the "foreign transactions current account," and capital transactions, such as capital transfers, are shown in the "foreign transactions capital account."

The summary NIPAs

The seven summary NIPAs constitute the accounting framework for presenting the value of production, distribution, consumption, and saving for the U.S. economy.[55] (For definitions of all of the line entries in these tables, and to see the tables themselves, see the appendix to this handbook.) Each of the entries in a summary account also appears again in that account or in one of the other summary accounts; most of these entries are also shown in one or more of the tables that make up the full set of NIPA tables. For example, the item "supplements to wages and salaries" is shown in line 5 of summary account 1 and in line 14 of summary account 3; it is also shown in line 8 of NIPA table 1.10 and in line 6 of NIPA table 2.1.

Taken together, the summary accounts constitute a double-entry system in which a use (or expenditure) recorded in one account for one sector is also recorded as a source (or receipt) in an account of another sector or of the same sector. This system of integrated, double-entry accounts provides a comprehensive measure of economic activity in a consistently defined framework without double-counting. Thus, the NIPAs, in combination with BEA's industry, wealth, and other economic accounts, can be used to trace the principal economic flows among the major sectors of the economy.

Account 1: Domestic Income and Product Account

This account represents an aggregation of the underlying production accounts for the domestic sectors of the U.S. economy. The right (product) side of the account shows GDP measured as the sum of goods and services sold to final users rather than as the sum of value-added by the sectors. The left (income) side of the account shows GDP as measured by the incomes earned in production—GDI—plus the "statistical discrepancy" (the difference between GDP and GDI). Product and income are both presented on a domestic basis—that is, they are produced by labor and property located in the United States.

Account 2: Private Enterprise Income Account

This account presents information on the sources and uses of the income of private businesses and other private enterprises.[56] It combines the accounts of private businesses, of homeowners for owner-occupied housing (which is treated as if it were a business), and of NPISHs.

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[55] Prior to the 2003 comprehensive update, the NIPAs were summarized in five accounts, as shown in table A on pages 38–39 of the August 2002 *Survey*. For a discussion of the differences between the old and new summary accounts, see Nicole Mayerhauser, Shelly Smith, and David F. Sullivan, "Preview of the 2003 Comprehensive Revision of the National Income and Product Accounts: New and Redesigned Tables," *Survey* 83 (August 2003): 8–15.

[56] Government enterprises are not included in account 2, because complete estimates on sources and uses of government enterprise income, notably the income payments and income receipts on assets, are not currently available. The sources and uses of government enterprise income are included, but not separately identified, in the government receipts and expenditures account.

Sources of private enterprise income—such as income receipts on assets and net operating surplus—are shown on the right side of the account.[57] The left side of the account shows the uses of income as income payments on assets (such as holders of financial liabilities and equity claims of other businesses), business current transfer payments, and income that accrues to the owners of business (namely proprietors' income, rental income of persons, and corporate profits). Corporate profits, a widely used measure in the United States, is distributed to government (taxes on corporate income) and to shareholders (net dividends) or is retained (undistributed profits, which can be thought of as a measure of corporate saving).

Account 3: Personal Income and Outlay Account

This account shows the sources and uses of income received by persons—that is, households, NPISHs, private noninsured welfare funds, and private trust funds. The right side of the account shows the sources of personal income—such as employee compensation and interest and dividend income. The left side shows personal taxes and outlays and personal saving, which is derived as personal income minus personal taxes and outlays.

Account 4: Government Receipts and Expenditures Account

This account summarizes the combined transactions of the federal government and of the state and local governments. The right side of the account shows government current receipts—such as tax receipts from persons and contributions for government social insurance. The left side shows government current expenditures—such as compensation of government employees and transfer payments to persons—and net saving, which is derived as current receipts less current expenditures.

Account 5: Foreign Transactions Current Account

This account summarizes all the current transactions between the United States and the rest of the world. It presents information on receipts and payments associated with foreign trade, income receipts and payments, and current taxes and other transfer payments. This account does not include transactions involving the acquisition or disposal of nonproduced nonfinancial assets nor capital transfers, which are shown in the foreign transactions capital account, nor does it include transactions in financial assets and liabilities. The left side of this account shows current receipts from the rest of the world—mainly exports of goods and services, income receipts on assets, and current taxes, contributions for government social insurance, and transfer receipts from the rest of the world. The right side shows current payments to the rest of the world—mainly imports of goods and services, income payments on assets, and current taxes and transfer

[57] Summary account 2 presents the components of private enterprise income on a national basis—that is, for income accruing to U.S. residents. Consequently, for the net operating surplus to be shown in account 2 on a domestic basis consistent with summary account 1, several components showing income flows to and from the rest of the world are added to account 2.

payments to the rest of the world. In addition, it includes the balance on current account, which is derived as current receipts less current payments.

Account 6: Domestic Capital Account

This account presents information on saving and investment for the economy. The right side of the account shows gross saving and the statistical discrepancy. Given the theoretical equality between GDP and GDI, the statistical discrepancy can be viewed as actual (positive or negative) income that is not captured by the data used to measure GDI and, therefore, not distributed to the sectors; instead, it is shown as a source of (positive or negative) saving in this account. The left side of the account shows gross domestic investment, capital-account transactions (net), and net lending or net borrowing, which is derived as gross saving and the statistical discrepancy minus gross domestic investment and capital-account transactions (net).

Account 7: Foreign Transactions Capital Account

This account presents information on transactions between the United States and the rest of the world that involve the acquisition or disposition of nonproduced nonfinancial assets and capital transfers. The left side of the account shows the balance on current account. The right side shows capital-account transactions (net) and net lending or borrowing, which is derived as the balance on current account minus capital-account transactions (net).

CHAPTER 3: PRINCIPAL SOURCE DATA

(Updated: May 2019)

Source data as determinants of initial release and revision schedules
Source data for the current quarterly estimates
Source data for the annual updates
Source data for the comprehensive updates

Source data are the information BEA uses to prepare the NIPA estimates, and estimating methods are the steps BEA takes to transform the source data into these estimates. The interaction of source data and estimating methods determines the accuracy, reliability, and relevancy of the accounts.

The data that BEA uses are collected from a variety of sources and are usually collected for purposes other than for incorporation into BEA's estimates. Data collected by federal government agencies provide the backbone of the estimates; these data are supplemented by data from trade associations, businesses, international organizations, and other sources. The Government data are from a number of agencies, including the Commerce Department's Census Bureau, the Labor Department's Bureau of Labor Statistics (BLS), the Treasury Department, the Office of Management and Budget, and the Agriculture Department. "Administrative" data are data that are tabulated by federal government and by state and local government agencies as a byproduct of administering their programs—such as processing corporate tax returns, regulating public utilities, and issuing building permits. Examples of important administrative sources of data for the NIPAs include the Internal Revenue Service's Statistics of Income program, which provides data for a number of NIPA income estimates, the *Budget of the United States Government* from the Executive Office of the President, which is the major source of data for the NIPA estimates of federal government consumption expenditures and gross investment, the social insurance programs of the Center for Medicare and Medicaid Services and the Social Security Administration, which provide data on health insurance and social security incomes, and the military payroll systems of the U.S. Department of Defense. "Statistical" data are data collected by the federal statistical agencies, such as the Census Bureau and BLS. These data consist of periodic economic and population censuses and a wide range of sample surveys, such as those that collect data on manufacturing and trade, employment, and prices. The relatively few surveys that BEA conducts cover international trade in services and international direct investment, both by foreign companies in the United States and by U.S. companies in foreign countries.

The source data available to BEA are not always ideal for the preparation of the NIPAs. BEA must develop methods that transform the best available data into estimates that are consistent with the NIPA concepts and framework and that fill gaps in the coverage of the source data. (See "Chapter 4: Estimating Methods.")

Source data as determinants of initial release and revision schedules

The availability of the source data is an important consideration in determining the schedules for the initial release and the subsequent revisions of the NIPA estimates. One factor affecting availability is the speed with which the source data are collected, compiled, and released. Another factor is whether the source data are part of a statistical program that, over time, provides more complete or otherwise better coverage—for example, if the sample is larger or if more detailed information is collected for an annual survey than for the monthly surveys.

In general, the most comprehensive source data for the expenditure components of gross domestic product (GDP) are available at the 5-year intervals associated with the economic census of establishments conducted by the Census Bureau. The economic census is the primary data source for BEA's input-output accounts, which are used to "benchmark" the NIPA estimates for the quinquennial census years. Related annual surveys are drawn from samples of the establishments covered in the economic census; these surveys generally collect less detailed data than those collected in the economic census. Many of the annual surveys are supplemented by monthly surveys that involve smaller samples and that collect less detailed data than the annual surveys.[1] In addition, responding to the censuses and annual surveys is generally mandatory, while responding to most of the quarterly and monthly surveys is voluntary.

The data from the monthly surveys are available first, and they provide much of the information that is used to prepare the initial, or "current," quarterly (and for a few components, monthly) NIPA estimates. These estimates are subsequently revised as additional reports become available from the monthly surveys. Annual updates, which are timed to incorporate newly available annual source data, are usually carried out each summer. Comprehensive updates, which incorporate the most complete source data as well as other improvements to the accounts, are carried out at about 5-year intervals.[2]

Thus, revisions do not reflect errors. On the contrary, revisions are mainly driven by the incorporation of more complete and revised source data, and the release of the revised estimates is determined by the availability of these data. The source data used to prepare

[1] Many of the annual and monthly surveys are based on "probability sampling" (sometimes known as "scientific sampling"). In this process, establishments are first placed into various "strata" on the basis of their size. Depending on the distribution of establishments, an establishment in the largest strata could have a 100-percent probability of selection and thus have a sampling weight of 1—that is, the establishment would represent only itself. An establishment in a smaller stratum would have a smaller probability of selection, say 1 percent, but in that case the establishment would have a sampling weight of 100—that is, the sampled establishment would represent 100 establishments.

[2] Unless noted otherwise, annual data are presented on a calendar-year basis (i.e., covering January through December). Quarter data are also presented on a calendar basis (i.e., the first quarter (Q1) covers January, February, and March; Q2 covers April, May, and June; Q3 covers July, August, and September; and Q4 covers October, November, and December).

the estimates of GDP and gross domestic income (GDI) can be grouped into five general categories based on their quality, availability, and use.[3]

- *Comprehensive data* provide comprehensive or nearly comprehensive coverage of the relevant population. They are either consistent with the concepts, coverage, or timing underlying the national accounts, or they can be made consistent with only minor adjustments.
- *Adjusted comprehensive data* provide comprehensive or nearly comprehensive coverage of the relevant population; however, these data require substantial adjustments in order to conform to the concepts underlying the national accounts.
- *Direct indicator data* are used to indicate the movements of a series rather than the levels of a series; they are closely related to the comprehensive data that are ultimately incorporated into the estimates, but they are less detailed or do not provide comprehensive coverage of the relevant population.
- *Indirect indicator data* are used to prepare indicator series when more suitable data are not available. They include volume or activity indicators and other NIPA estimates.
- *Trend-based data* are used when no data are available; they are typically based on previous estimates, using moving averages, regressions, growth factors, or judgment.

The following sections describe the most important federal government source data that are used for the current quarterly estimates and for the annual and comprehensive updates of the NIPAs. In the preparation of the estimates, these sources are augmented by a wealth of information from other public sources and from private sources, such as trade associations.

Source data for the current quarterly estimates

Data from Census Bureau monthly surveys are among the primary sources for the current quarterly estimates (table 3.1). For the most part, the samples for these voluntary surveys are drawn from the economic census, from the corresponding annual surveys, and from the Business Register; the samples are updated periodically to account for new businesses ("births") and for businesses that discontinue operations ("deaths").[4]

[3] For more information, see Alyssa E. Holdren, "Gross Domestic Product and Gross Domestic Income: Revisions and Source Data," *Survey of Current Business* 94 (June 2014): 1–11.

[4] The Business Register is a comprehensive database of U.S. business establishments and companies that is maintained by the Census Bureau for statistical program use. A "business" is defined as legal or administrative entity that is assigned an employer identification number (EIN) by the Internal Revenue Service.

Table 3.1—Principal Sources for the Current Quarterly Estimates

Source	Agency
Monthly Survey of Manufacturers' Shipments, Inventories, and Orders	Census Bureau
Monthly Wholesale Trade Survey	Census Bureau
Monthly Retail Trade and Food Services Survey	Census Bureau
Quarterly Services Survey	Census Bureau
Monthly construction spending (value put in place)	Census Bureau
Monthly U.S. international trade in goods and services	Census Bureau and Bureau of Economic Analysis
U.S. International Transactions Accounts	Bureau of Economic Analysis
Annual projections and quarterly farm data	Agriculture Department
Monthly Current Employment Statistics	Bureau of Labor Statistics
Quarterly Financial Report	Census Bureau
Monthly Treasury Statement	Treasury Department
Consumer Price Index	Bureau of Labor Statistics
Producer Price Index	Bureau of Labor Statistics
International Price Indexes	Bureau of Labor Statistics

Monthly Survey of Manufacturers' Shipments, Inventories, and Orders (M3) is a Census Bureau survey of manufacturing companies. Although the survey is by company rather than by establishment, most large, diversified companies file separate reports for "divisions" with significant activity in different industrial areas. Data are collected on the value of shipments, on total inventories and inventories by stage of fabrication, and on new orders received and unfilled orders. These source data are primarily used in estimating investment in private equipment, change in private inventories, and nonfarm proprietors' income. An advance report on durable-goods manufacturers' shipments and orders is released about 3½–4 weeks after the close of the "reference" month.[5] The composite M3 data are released about 5 weeks after the close of the reference month.

Monthly Wholesale Trade Survey (MWTS) is a Census Bureau sample survey of companies that are primarily engaged in merchant wholesale trade (merchant wholesalers that take title to the goods they sell—such as jobbers, industrial distributors, exporters, and importers). Data are collected on the dollar values of wholesale sales and end-of-month inventories. The MWTS data are primarily used in estimating change in private inventories and nonfarm proprietors' income. The MWTS reports are released about 6 weeks after the close of the reference month and are incorporated into BEA's 2nd and 3rd estimates of GDP; the Census Bureau makes an advanced report on wholesale trade available to BEA in time to incorporate the data into its advance GDP estimates.

Monthly Retail Trade and Food Services Survey is a Census Bureau sample survey of companies that sell merchandise and related services to final consumers. Data are collected on the dollar value of retail sales and end-of-month inventories. These source data are primarily used in estimating personal consumption expenditures (PCE)

[5] The "reference" period (in this case month) is the period for which the data are collected.

and change in private inventories. An advance report on monthly sales for retail and food services (MARTS) is released about 1½–2 weeks after the close of the reference month. The composite retail sales and inventories data are released about 6 weeks after the close of the reference month and are incorporated into BEA's 2nd and 3rd estimates of GDP; the Census Bureau makes an advanced report on retail inventories available to BEA in time to incorporate the data into its advance GDP estimates.

Quarterly Services Survey (QSS) is a Census Bureau sample survey that was initiated in 2003–2004 in order to improve the coverage of the service industries in the U.S. economy. The coverage of the QSS has since been expanded several times so that it now covers most of the categories of health care, transportation services, recreation services, communication services, and professional and other services.[6] The QSS data are primarily used in estimating PCE and private investment in intellectual property products. The QSS data are released about 2½ months after the close of the reference quarter.

The Census Bureau also makes advance QSS data available to BEA approximately 50 days following the end of each reference quarter, in time for the data to be incorporated into several PCE services estimates and estimates of private fixed investment in software as part of the second GDP release for each quarter.

Monthly construction spending (value put-in-place) is a Census Bureau measure of the value of construction installed or erected during a given period. The data for private nonresidential buildings, for government structures, and for multifamily residential buildings are derived from data collected by sampling the owners of construction projects.[7] The data for single-family residential buildings are derived indirectly using information collected in a series of sample surveys that track the number of housing-unit permits, starts, sales, and completions. The data for "other construction" are derived from a variety of sources covering farm, utility, communication, and railroad structures. These source data are primarily used in estimating private and government investment in structures. The data for construction put-in-place are released about 1 month after the close of the reference month.

Monthly U.S. international trade in goods and services consist of Census Bureau estimates of trade in goods and BEA estimates of trade in services. The Census Bureau tabulations of exported and imported goods are from documents filed with Customs and Border Protection, U.S. Department of Homeland Security; they cover all shipments above a certain size and a sample of the remaining shipments. The reports are incorporated into BEA's 2nd and 3rd estimates of GDP; the Census Bureau makes an advanced report on trade in goods available to BEA in time to incorporate the data into its

[6] For a discussion of the QSS data beginning with 2011, see Eugene P. Seskin and Alyssa E. Holdren, "Annual revision of the National Income and Product Accounts," *Survey of Current Business* 92 (August 2012): 24.

[7] In contrast, the census of construction, which is part of the economic census, measures construction on the basis of reports by establishments primarily engaged in construction. Thus, value put-in-place captures some important parts of construction activity that are not included in the census—such as nonemployer construction, architectural and engineering costs, own-account construction, homeowner construction, and construction done as a secondary source of revenue by nonconstruction establishments.

advance GDP estimates. The BEA estimates of trade in services are primarily based on 11 mandatory BEA surveys of selected services receipts, payments, and other data. These data are supplemented by a combination of monthly indicator source data, partial data from U.S. government agencies and from foreign central statistical offices and banks, and other secondary source data. These source data are primarily used in estimating private investment in equipment and in software and in estimating exports and imports. The U.S. international trade statistics are jointly released by the two agencies about 5 weeks after the close of the reference month.

International Transactions Accounts (ITAs), prepared by BEA, summarize the quarterly transactions between the United States and the rest of the world. In the ITAs, the current account records exports and imports of goods and services, receipts and payments of income on assets, and unilateral transfers (net gifts to other countries). In the capital and financial account, the capital account records capital transfers (such as debt forgiveness) and the financial account records transactions involving exchanges of financial assets for other financial assets or for tangible resources and gifts or grants of financial assets. These source data are primarily used in estimating corporate profits. The ITAs are released about 2½ months after the close of the reference quarter.

Annual projections and quarterly farm data, from the U.S. Department of Agriculture, consist of annual projections of crop output, quarterly projections of cash receipts and of inventories for livestock, and annual projections of government subsidy payments and production expenses for both crops and livestock. These data are primarily used in estimating change in private inventories and farm proprietors' income.

Monthly Current Employment Statistics (CES) survey is a sample survey of business establishments that is conducted by state employment security agencies in cooperation with BLS. The CES (also known as BLS-790) covers payroll employment in private nonagricultural industries during the pay period that includes the 12th of the month. The data collected include series for total employment, number of production or nonsupervisory workers, average hourly earnings, average weekly hours, average weekly earnings, and average weekly overtime hours in manufacturing industries. (BLS has developed experimental series that extend coverage to all employees and that include irregular payments, such as bonuses.) These source data are primarily used in estimating PCE, wages and salaries, and nonfarm proprietors' income. The CES data are usually released on the first Friday following the close of the reference month.

Quarterly Financial Report (QFR), prepared by the Census Bureau, provides aggregate statistics on the financial position of U.S. corporations. Based on a sample survey of firms above specified asset sizes, the QFR presents estimated statements of income and retained earnings, balance sheets, and related financial and operating ratios for manufacturing, mining, trade, and selected service corporations by industry and by asset size. These source data are primarily used in estimating corporate profits. The QFR statistics are released about 75 days after the end of the first, second, and third calendar quarters, and approximately 90 days after the end of the fourth calendar quarter..

Monthly Treasury Statement (MTS), prepared by the Financial Management Service of the U.S. Department of the Treasury, summarizes the financial activities of the federal government and off-budget federal entities in accordance with the Budget of the U.S. Government. The MTS presents a summary of receipts and outlays, surplus or deficit, and means of financing. The data are provided by federal entities, disbursing officers, and Federal Reserve banks. These source data are primarily used in estimating federal government receipts and expenditures and federal government consumption expenditures and gross investment. The MTS is usually released about 8 days after the close of the reference month.

Consumer Price Index (CPI), prepared by BLS, is a family of indexes that measure the average monthly change in the prices paid by urban consumers for a fixed market basket of goods and services. The CPI covers "out-of-pocket" expenditures, including user fees (such as water and sewer service) and sales and excise taxes paid by the consumer but excluding income taxes and investment items (such as stocks, bonds, and life insurance). The CPI is estimated from a statistical set of samples of urban areas, of consumers within those areas, of retailers and other outlets, and of specific, unique items purchased. CPIs are primarily used in deflating PCE, change in private inventories, and state and local government purchases. The CPI is released 2–3 weeks after the close of the reference month.

Producer Price Index (PPI), prepared by BLS, is a family of indexes that measure the average monthly change in prices received by domestic producers of goods and services. In 2014, BLS significantly expanded its current coverage of the United States economy to over 75 percent of in-scope domestic production. The expansion featured a transition from stage-of-processing to final demand-intermediate demand aggregation by incorporating PPIs for services, construction, government purchases, and exports.[8] The PPI is estimated from data collected from a sample of establishments that participate in the Unemployment Insurance System, a joint federal and state program that covers about 97 percent of wage and salary workers. PPIs are primarily used in deflating private investment in structures and equipment, change in private inventories, government purchases, and exports and imports. The PPI is released about 2 weeks after the close of the reference month.

International Price Indexes, prepared by BLS, measure monthly changes in the prices of goods and services that are sold by U.S. producers to foreign buyers (exports) and that are purchased from abroad by U.S. buyers (imports). The price indexes for exports of goods to Canada are based primarily on sampling information obtained from the Canadian Customs Service, and the indexes for exports of goods to other countries are based on sampling information obtained from the U.S. Census Bureau. The price indexes for imports of goods are based on sampling information obtained from Customs and Border Protection, U.S. Department of Homeland Security. The price indexes for exports and imports of services are based on sampling information that is developed separately for each service category. These price indexes are primarily used in deflating

[8] See "Producer Price Index Transitions from Stage-of-Processing to the Final Demand-Intermediate Demand Aggregation System," at https://www.bls.gov/.

private investment in equipment, change in private inventories, and exports and imports. The International Price Indexes are released about 2 weeks after the close of the reference month.

Estimating schedule

For GDP and most other NIPA series, the estimates for each quarter are prepared on a schedule that calls for three successive "current" estimates—"advance," "second," and "third."[9] The specific release date for each month is primarily determined by the availability of the monthly reports on retail sales, manufacturing shipments, and international trade in goods from the Census Bureau (along with the time it takes BEA to process them).

- The advance quarterly estimate of GDP is released near the end of the month that follows the close of the reference quarter. For most of the product-side components, the estimate is based on source data for either 2 or 3 months of the quarter. In most cases, however, the source data for the second and third months of the quarter are subject to revision by the issuing agencies. Where source data are not available, the estimate is based primarily on BEA projections.[10]
- One month later, the advance estimate is replaced by the second estimate, which is typically based on source data for all 3 months of the quarter. However, in some instances, the source data used for the second estimate, particularly the data for the third month of the quarter, are subject to further revision.
- One month later, the second estimate is replaced by the third estimate, which incorporates revisions to source data for the third month of the quarter and newly available quarterly source data for some components.

For certain "income-side" series—gross national product, gross domestic income, national income, and corporate profits—"advance" estimates are not prepared, because of a lag in the availability of source data. For the first, second, and third quarters of the year, the release of the second GDP estimate presents the initial estimates for these income-side series, and the third GDP release presents revised estimates. For the fourth quarter, the estimates for these series are presented only in the third GDP release.

In addition, when the second estimate of GDP for the current quarter is released, the preceding quarter's estimates of private wages and salaries and affected income-side aggregates are revised to incorporate newly available preliminary tabulations from the

[9] In the 2009 comprehensive update of the NIPAs, BEA introduced new names for the second two vintages of the current quarterly estimates. Formerly, the "second" estimate was known as the "preliminary" estimate, and the "third" estimate" was known as the "final" estimate. The initial estimate continues to be named the "advance" estimate. (See Eugene P. Seskin and Shelly Smith, "Preview of the 2009 Comprehensive Revision of the NIPAs: Changes in Definitions and Presentations," *Survey* 89 (March 2009): 19–20.)

[10] A comprehensive table that presents the "Key Source Data and Assumptions" that are used to prepare each vintage of the estimate of GDP for the current quarter is available on BEA's website at www.bea.gov.

BLS quarterly census of employment and wages (QCEW).[11] (For a description of the QCEW, see the section on source data for annual updates.)

Source data for successive vintages

As of 2014, indirect indicator data account for 34 percent of the source data used to calculate the advance GDP estimates.[12] Comprehensive data account for over 25 percent. Trend-based data account for 28 percent, and direct indicator data account for the remainder. (See chart 3.1 on the next page).

For the advance GDP estimates, indirect indicator and trend-based data together account for almost two-thirds of the source data used to calculate the estimates; for the third estimate, the two together account for only one-third-. Conversely, the share for the more-accurate comprehensive and direct indicator data, combined, increases from just over one-third to about two-thirds from the advance to the third estimate.

For estimates of GDI, there is a slower progression from less-comprehensive to more-comprehensive source data. Indirect indicator data account for 56 percent of the source data used to calculate the estimates for both the second and third estimates (as noted above, there is no advanced estimate for GDI). Trend-based data account for 31 percent of the source data in the second estimate, and 30 percent in the third. Direct indicator data make up only 12 and 13 percent of the second and third estimates respectively, and comprehensive data accounts for less than 1 percent in both estimates. However, the revision of the previous-quarter estimates at the time of the second release of GDP brings the use of comprehensive data up to 34 percent, and the use of indirect indicator and trend-based data down to 23 and 30 percent, respectively.

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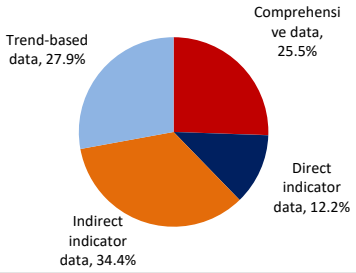
[11] Affected aggregates include gross domestic income, the statistical discrepancy, gross national income, national income, personal income, disposable personal income, personal saving, gross (national) saving, compensation, and gross product of corporate business. Other components that are closely linked to wages and salaries, such as personal current taxes and employer contributions for government social insurance, are also revised. Product-side series, including GDP, are not affected.

[12] See Alyssa E. Holdren, "Gross Domestic Product and Gross Domestic Income: Revisions and Source Data," *Survey* 94 (June 2014).

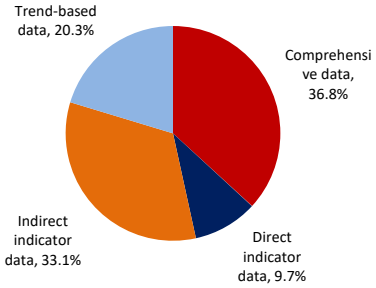
Chart 3.1— Shares of Source Data for the Quarterly GDP and GDI Estimates

GDP Estimates

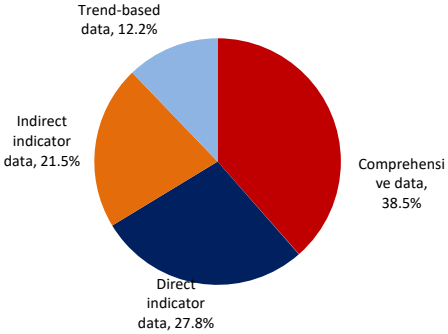
Advance



Second



Third



Revised Previous Quarter

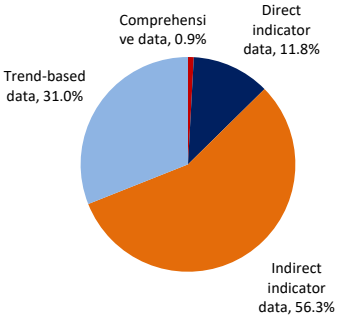
Not applicable

GDI Estimates

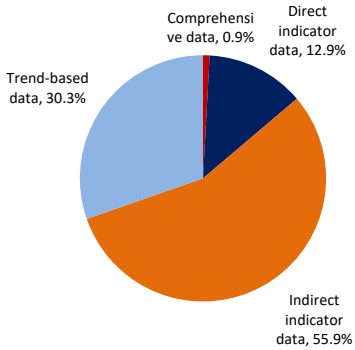
Advance

Not applicable

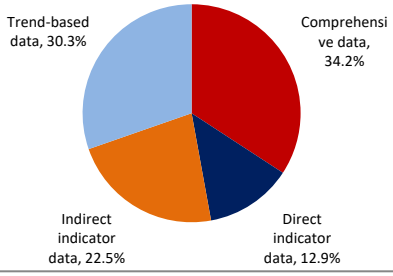
Second



Third



Revised Previous Quarter



Source data for the annual updates

Annual updates of the NIPAs are usually released in July and cover the months and quarters of the most recent calendar year and of the 4 preceding years.[13] The NIPA estimates for the most recent calendar year are revised to incorporate revisions that result from annual benchmarking of some of the principal monthly or quarterly source data. The NIPA estimates for all 3 years are revised to incorporate a broad range of newly available and revised annual source data (table 3.2). For the expenditures components, the newly available source data include annual surveys conducted by the Census Bureau. For the income components, the newly available source data include IRS tabulations of income tax returns and BLS tabulations of employment and wage information.

Table 3.2—Principal Newly Available Sources for NIPA Annual updates

Source	Agency
Annual Survey of Manufactures	Census Bureau
Annual Wholesale Trade Survey	Census Bureau
Annual Retail Trade Survey	Census Bureau
Service Annual Survey	Census Bureau
Annual surveys of state and local government finances	Census Bureau
Annual update of the International Transactions Accounts	Bureau of Economic Analysis
Annual farm statistics	Agriculture Department
Quarterly Census of Employment and Wages	Bureau of Labor Statistics
Tabulations of tax returns	Internal Revenue Service
Federal government annual budget	Office of Management and Budget

The first four sources listed in table 3.2 are the annual counterparts of the Census Bureau monthly surveys used for the current quarterly estimates. The more extensive annual survey samples are from companies listed in the Business Register, and the recipients are selected by stratified probability sampling. Response to these surveys is mandatory. New samples are usually selected after each economic census, and the samples are updated periodically to reflect business "births" and "deaths."

Annual Survey of Manufactures (ASM) is a Census Bureau survey of manufacturing establishments with paid employees. The ASM is conducted in the years between economic censuses—that is, in all years not ending in 2 or 7. Data are collected on employment, payroll, value added by manufacture, materials consumed, value of shipments, detailed capital expenditures, supplemental labor costs, fuels and electric

[13] As part of the 2018 comprehensive update of the NIPAs, BEA extended the typical open period for annual updates of the NIPAs from 3 to 5 years. As part of the "flexible" approach to annual updates that BEA introduced in 2010, the open period may be extended beyond 5 years to allow for the incorporation of improvements in methodology. See Pamela A. Kelly, Stephanie H. McCulla, and David B. Wasshausen, "Improved Estimates of the National Income and Product Accounts: Results of the 2018 Comprehensive Update," Survey 98 (September 2018) and "BEA Briefing: Improving BEA's Accounts Through Flexible Annual Revisions," *Survey* 88 (June 2008): 29–32.

energy used, and inventories by stage of fabrication. These source data are primarily used in estimating private investment in equipment, change in private inventories, and nonfarm proprietors' income. The ASM data are published about 11 months after the close of the reference year.

Annual Wholesale Trade Survey (AWTS) is a Census Bureau survey of companies that have significant activity in wholesale trade. These companies include wholesalers that take title of the goods they sell—such as jobbers, industrial distributors, exporters, importers, and manufacturer sales branches and offices (MSBOs)—and, beginning in 2007, wholesalers that do not take title—such as agents, merchandise and commodity brokers, commission merchants, and electronic business-to-business marketers. Merchant wholesalers excluding MSBOs provide data on sales, inventories, inventory valuation, purchases, and gross margin. MSBOs provide data on sales, inventories, inventory valuation, and operating expenses. The wholesalers that do not take title provide data on sales, commissions earned, gross selling value of sales conducted for others, and operating expenses. The AWTS data are primarily used in estimating change in private inventories and nonfarm proprietors' income. The statistics for all wholesalers are normally published about 15 months following the close of the reference year.

Annual Retail Trade Survey (ARTS) is a Census Bureau survey of retail companies with one or more establishments that sell merchandise and associated services to final consumers. The survey is sent to a sample of retail establishments with paid employees, and the data collected are supplemented by administrative data to account for businesses without paid employees (typically self-employed individuals or unincorporated partnerships). The ARTS collects data on the dollar value of retail sales, sales taxes collected, inventories, inventory valuation, cost of purchases, and accounts receivables balances. These source data are primarily used in estimating PCE and change in private inventories. The statistics are normally published about 15 months following the close of the reference year.

Service Annual Survey (SAS) is a Census Bureau survey of companies that provide services to individuals, businesses, and governments. The survey is sent to selected businesses with paid employees, and the data collected are supplemented by administrative data or imputed values to account for businesses without paid employees. The data collected include operating revenue for both taxable and tax-exempt firms and organizations, sources of revenue, exports, and inventories for selected industries, and selected industry-specific items. The SAS has been expanded over time in order to improve the coverage of the service industries in the U.S. economy.[14] The SAS data are primarily used in estimating PCE and private investment in intellectual property products. The statistics are normally published about 12 months after the close of the reference year.

[14] For a discussion of the most recent expansion of the SAS, see Eugene P. Seskin and Alyssa E. Holdren, 24.

Annual surveys of state and local government finances, prepared by the Census Bureau, provide data on the financial activities of state governments and of local governments, including counties, municipalities, townships, special districts, and school districts. The data are compiled from three sources: an enumeration of all 50 states, a probability sample survey of local governments, and data from federal government agencies. Reported data are for each government's annual accounting period (fiscal year) that ends on or before June 30 of the survey year. Data are obtained for revenue, expenditure, debt, and financial assets. These source data are primarily used in estimating state and local government spending, employee compensation, and taxes on production and imports. The data are available about 12 months after the close of the survey year.

Annual revision of the International Transactions Accounts (ITAs), prepared by BEA, incorporates newly available annual source data and statistical, methodological, and presentational improvements into the accounts, which may result in revisions that extend back for a number of years.[15] (The ITAs were described in the preceding section on sources for the current quarterly estimates.) These source data are primarily used in estimating exports of goods and services, and imports of goods and services. The annual update of the ITAs is released in mid-June.

Annual farm statistics are collected in the Agricultural Resource Management Survey (ARMS), which is sponsored jointly by the Economic Research Service and the National Agricultural Statistics Service of the U.S. Department of Agriculture. The ARMS starts in the fall with the collection of data on crop production and costs and finishes in the spring with the collection of data on whole farm and livestock production practices and costs. The data, which underpin USDA's annual estimates of net farm income, cover virtually every aspect of U.S. agriculture, including production and supplies, prices paid and received, farm labor and wages, and farm finances. These source data are primarily used in estimating change in private inventories and farm proprietors' income. The ARMS data are available in the fall following the close of the reference year.

Quarterly Census of Employment and Wages (QCEW) is a cooperative program (also known as the ES-202 program) involving BLS and the state employment security agencies. The QCEW produces a comprehensive tabulation of employment and wage information for workers who are covered by state unemployment insurance programs or by the unemployment insurance program for federal employees; as such, the QCEW is a virtual census of nonagricultural employment and wages. These source data are primarily used in estimating PCE, wages and salaries, and nonfarm proprietors' income. The QCEW data are usually released to the public 6 to 7 months after the close of the reference quarter.[16]

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[15] For a description of an annual update of the ITAs, see the most recent July issue of the *Survey*.

[16] As noted in footnote 9, some preliminary information from the QCEW is incorporated into the quarterly estimates on a delayed basis. However, the annual NIPA update provides the opportunity for a more complete incorporation of these data.

Tabulations of tax returns, prepared by the IRS Statistics of Income program, are compilations of information from the tax returns of corporations and of sole proprietorships and partnerships. The aggregate data are compiled based on stratified probability samples of tax or information returns. The data collected include by-industry information on assets, business receipts and deductions, and net income. The source data are primarily used in estimating corporate profits and nonfarm proprietors' income. The data for nonfarm sole proprietorships and partnerships are released to the public about 1 ½–1 ¾ years after the end of the tax year, and the data for corporations are released to the public about 1 ¾ years after the end of the tax year.[17]

Federal government annual budget, a report prepared by the Office of Management and Budget, presents preliminary estimates of U.S. Government receipts and expenditures for the current fiscal year (October 1 through September 30) and revised data for the preceding fiscal year, as well as the President's proposed budget for the upcoming fiscal year. Data are provided on budget receipts by source, such as individual and corporate income taxes, and on budget outlays by function, such as national defense and Medicare. These source data are primarily used in estimating federal government spending and wages and salaries. The report is usually released in early February.

Source data for the comprehensive updates

Comprehensive updates of the NIPAs are carried out about every 5 years, and they may result in revisions that extend back for many years. These revisions are timed to incorporate the infrequent but most comprehensive source data, and they also provide the opportunity to incorporate definitional, statistical, and presentational improvements to the accounts. Generally, comprehensive updates replace the annual update that would normally take place in that year, and so they also incorporate the source data that would normally be incorporated in the annual update. The most important source for the comprehensive update is BEA's benchmark input-output tables, which, in turn, are primarily based on the detailed information collected in the economic census conducted by the Census Bureau (table 3.3).

Table 3.3—Principal Newly Available Sources for NIPA comprehensive updates

Source	Agency
Benchmark input-output accounts	Bureau of Economic Analysis
Economic census	Census Bureau
Census of governments	Census Bureau

[17] For corporations, the tax year covers tax returns that are filed for accounting periods ending in July of one year through June of the following year; for most corporations, the accounting period coincides with the calendar year.

Benchmark Input-Output (I-O) Accounts, prepared by BEA, are U.S. economic accounts that provide detailed statistics on economic processes and the relationships between various industries in the U.S. economy. The core of the I-O accounts consists of the "supply" table, which shows the value of each commodity produced by each industry, and the "use" table, which shows the consumption of each commodity by each industry or final user. The benchmark I-O accounts, which are prepared at about 5-year intervals, incorporate a vast amount of source data, the most important of which are data from the economic census. The I-O account estimates are used extensively as benchmarks for many of the corresponding NIPA estimates, but I-O accounts also directly incorporate some of the NIPA estimates, such as the estimates for owner-occupied housing and for motor vehicles. The benchmark I-O accounts are usually released about 5 years after the reference year for the economic census.[18]

Economic Census conducted by the Census Bureau, is a mandatory census that provides a detailed portrait of the nation's economy once every 5 years.[19] The economic census consists of several censuses that cover nearly all private industries, including manufacturing, wholesale and retail trade, construction, transportation, information, services, and finance and insurance.[20] In the 2007 Economic Census, report forms were sent to the establishments of all large employers (all multi-establishment firms and all firms with a payroll above a specified cutoff) and to a stratified sample of small employers (single-establishment firms with payroll below the cutoff). Statistics for selected small employers (for example, those with fewer than 10 employees) and all firms without employees were compiled from administrative records of the IRS and other federal government agencies. The economic census is the most important data source for the benchmark I-O accounts. Results from the economic census are released over a period of several years.

Census of Governments, which is conducted by the Census Bureau in the same years as the economic census, is a voluntary census that provides periodic and comprehensive statistics about governments and governmental activities. The census covers all state and local governments, including counties, cities, townships, special districts, and school districts. Data are collected on revenues, expenditures, debt, assets, employees, payroll, and benefits for the individual fiscal year that ended prior to July 1 of the census year. These source data are primarily used in estimating state and local government spending. The financial data are released beginning about 16 months after the close of the census year, and the employment data are released beginning about 12 months after the close of the census year.

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[18] Effective with the 2013 cycle of comprehensive updates of the NIPAs and releases of the benchmark I-O accounts, the two sets of accounts are fully integrated—that is, the results of the 2013 comprehensive NIPA revision were released before publication of the 2007 benchmark I-O accounts. Previously, benchmark I-O accounts were released first, and thus they were not fully consistent with the revised NIPA estimates. For more information, see Erich H. Strassner and David B. Wasshausen, "Preview of the 2013 Comprehensive Revision of the Industry Economic Accounts," *Survey* 93 (June 2013): 19–33.

[19] See "Economic Census" at https://www.census.gov/programs-surveys/economic-census.html.

[20] Prior to the 1997 Economic Census, these censuses were referred to in the plural—that is, as "economic censuses"—because they were considered to be compilations of distinct censuses for each major industry.

CHAPTER 4: ESTIMATING METHODS

(Updated: May 2019)

Current-Dollar Estimates
- Adjustments to the source data
- Seasonal adjustment
- Moving average
- Best level and best change
- Interpolation and extrapolation using an indicator series
- Three special estimation methods
  - Commodity-flow method
  - Retail control method
  - Perpetual inventory method

Quantity and Price Estimates
- Estimates for detailed components
- Estimates for NIPA aggregates
- Properties of chain-type measures

Appendix to Chapter 4
- Calculation of Output and Price Indexes
  - Adjusting for quality change
- Statistical Tools and Conventions
  - Chained-dollar measures
  - Contributions to percent change
  - Annual rates
  - Growth rates
  - Rebasing an index

The NIPA measures are built up from a wide range of source data using a variety of estimating methods. Each NIPA component is derived using a specific methodology—that is, source data and estimating methods—that progresses from the advance quarterly estimate through the comprehensive NIPA revision.

The methodologies used to prepare the various NIPA estimates are periodically changed in order to incorporate improvements in the source data or in the estimating methods.[1]

[1] Substantive changes to NIPA methodologies are documented in BEA's monthly *Survey of Current Business,* and this handbook is updated after each annual update of NIPAs.

- Over time, source data may emerge or disappear, so new source data must be identified and evaluated, and estimating methods must be adapted accordingly.
- Advances in statistical techniques or in other aspects of estimation must be evaluated for adoption into the methodology.
- As the U.S. economy evolves, the methodologies must be updated to ensure that the estimates continue to provide a reliable and relevant picture of transactions and transactors in the economy.

The examples provided in this chapter are simplified in order to illustrate the basic estimating concepts and calculations. In practice, the procedures used for deriving the NIPAs involve complex statistical techniques that are designed to ensure consistency across the entire time series for a given estimate and between interrelated estimates.

Current-Dollar Estimates

For most NIPA components, the current-dollar, or nominal, estimates are derived from source data that are "value data," which reflect the product of quantity and price. For the estimates that are not derived from value data, separate quantity data and price data must be combined. For example, an estimate of expenditures on new autos may be calculated as the number of autos sold times expenditure per auto (at transaction prices—that is, the average list price with options adjusted for transportation charges, sales taxes, dealer discounts, and rebates). An estimate of wages may be calculated as employment times average hourly earnings times average hours worked, and an estimate of interest received may be calculated as the stock of interest-bearing assets times an effective interest rate. (The NIPA current-dollar estimates are expressed at annual rates; see the appendix to this chapter.)

Adjustments to the source data

BEA makes three general types of adjustments to the source data that are incorporated into the NIPA estimates. The first consists of adjustments that are needed so that the data conform to appropriate NIPA concepts and definitions. For example, Internal Revenue Service data from corporate tax returns include estimates of depreciation, but these estimates are based on historical-cost valuation and on tax service lives. BEA must adjust these estimates to the NIPA definition of depreciation—consumption of fixed capital—which is based on current-cost valuation and economic service lives.

The second type of adjustment involves filling gaps in coverage. For example, one of the primary sources for the quarterly estimates of the change in private inventories component of

GDP is the Census Bureau's Monthly Wholesale Trade Survey. However, this source does not cover inventories of nonmerchant wholesalers (wholesalers that do not take title to the goods they sell). Thus, the survey data must be augmented by separate BEA estimates for the change in the inventories of these wholesalers.

The third type of adjustment involves time of recording and valuation. For example, in the NIPAs (as in BEA's international transactions accounts), imported goods are valued at "foreign port value"—that is, the value at the point of exportation to the United States. The source data on imports of goods from Canada, which the Census Bureau receives in a bilateral data exchange with Canada, are often valued at the point of manufacture; thus, BEA must adjust these data to foreign port value by adding the cost of transporting these goods within Canada from the point of manufacture to the point of export to the United States.

In addition, source data must occasionally be adjusted to account for special circumstances that affect the accuracy of the data. For example, the monthly current employment statistics are collected in the middle of the month, which is assumed to represent conditions during the entire month. Thus, these source data may need to be adjusted if a significant event, such as a blizzard that blankets much of the eastern United States, occurs during that period.

Seasonal adjustment

Seasonal adjustment of a time series removes the average effect of variations that normally occur at about the same time and in about the same magnitude each year—for example, the effect of weather or holidays. After seasonal adjustment, trends, business cycles, and other movements in the time series stand out more clearly.

Table 4.1 and chart 4.1 illustrate the effects of seasonally adjusting a series that exhibits a significant seasonal pattern. The unadjusted series shows a pattern of consistent strength in the second and third quarters and corresponding weakness in the first and fourth quarters. The seasonally adjusted series removes that seasonal component resulting in a series that reflects trends, business cycles, and other movements.

Most of the source data agencies that provide BEA with data provide both seasonally adjusted data and not seasonally adjusted data. Where seasonally adjusted data are provided, BEA uses them to estimate quarterly and monthly NIPA estimates.

For source data that are not available on a seasonally adjusted basis, BEA evaluates those series for seasonality using the Census Bureau's X-13 ARIMA software.[2] Where seasonality is identified, the seasonal adjustment applied to the source data that underlie NIPA estimates generally reflects concurrent factors that are updated as additional data observations become available over the course of the year. Where seasonality is not found, the seasonally adjusted estimates will equal the not seasonally adjusted estimates (see the box "Introduction of Not Seasonally Adjusted Estimates"). Where necessary, adjustments are made to ensure that seasonally adjusted and not seasonally adjusted quarterly values sum to the annual value for a given year.

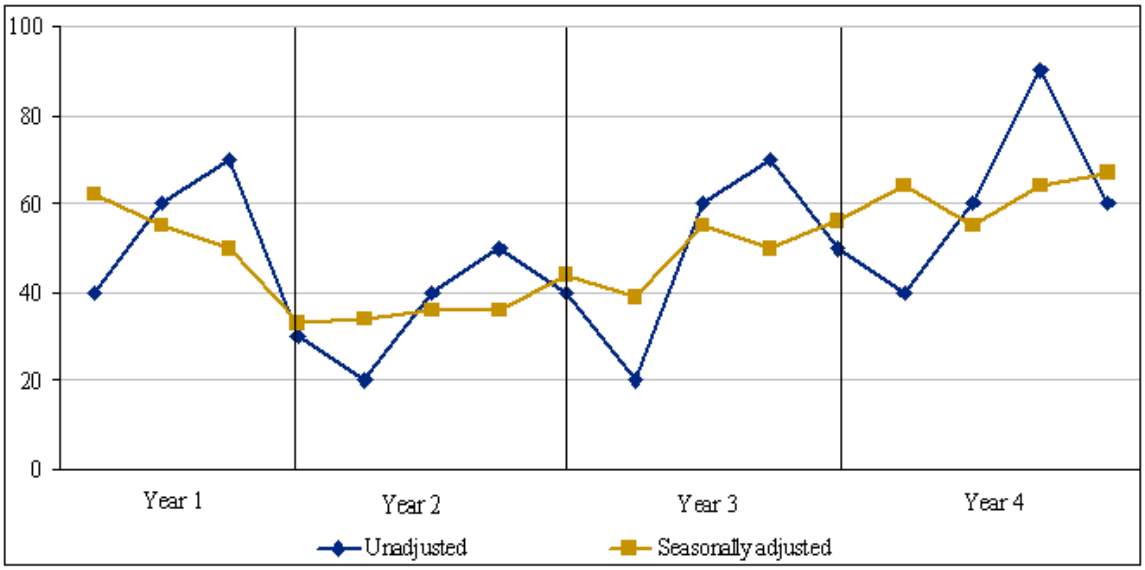
Each year, as part of the annual NIPA update, BEA closely examines the seasonal adjustment of selected source data underlying the NIPA estimates. As part of this annual evaluation, the seasonality of each series is evaluated, model specifications for deriving seasonal factors are updated, and seasonal factors are recalculated. At a minimum, the updated factors are applied to the quarters and months for the most recent five years, consistent with BEA's general revision policies and with seasonal adjustment best practices. In addition to examining selected source data, BEA also tests all NIPA series for seasonality. NIPA aggregates, which are indirectly seasonally adjusted by aggregating seasonally adjusted component detail, are carefully evaluated for residual seasonality.[3]

As part of the 2018 comprehensive update of the NIPAs, BEA introduced measures of GDP, GDI, and their major components that are not seasonally adjusted. These measures facilitate analyses of seasonal adjustment methods by distinguishing movements that are attributable to underlying source data from those that attributable to seasonal adjustment (see "Introduction of Not Seasonally Adjusted Estimates," below).

[2] X-13 ARIMA is a software program developed by the Census Bureau to identify and remove seasonal effects from a time series; for more information, see the Census Bureau website at www.census.gov. On occasions where a series lacks a sufficient time span to derive seasonal factors, BEA may use smoothing techniques such as moving averages to reduce seasonality in the data.

[3] Residual seasonality is a manifestation of seasonal patterns in data that have already been seasonally adjusted. For more information on residual seasonality and BEA's associated research and improvements, see Benjamin Cowan, Shelly Smith, and Sarahelen Thompson, "Seasonal Adjustment in the National Income and Product Accounts: Results from the 2018 Comprehensive Update," *Survey of Current Business* 98 (August 2018). Also see Brent R. Moulton and Benjamin D. Cowan, "Residual Seasonality in GDP and GDI: Findings and Next Steps," *Survey of Current Business* 96 (July 2016): 1-6 and see Stephanie H. McCulla and Shelly Smith, "The 2016 Annual Update of the National Income and Product Accounts," *Survey* 96 (August 2016): 1-31.

Chart 4.1—Illustration of Seasonal Adjustment



Not Seasonally Adjusted Estimates

As part of the 2018 comprehensive update of the National Income and Product Accounts (NIPAs), BEA introduced new not seasonally adjusted (NSA) quarterly estimates for GDP, GDI, and their major components; quarterly estimates are available for 1947 forward.[1] The new NSA estimates are an additional tool that may be used to evaluate quarterly economic performance and to distinguish movements attributable to the unadjusted underlying source data from those attributable to seasonal adjustment.

As with seasonally adjusted estimates, the NSA estimates are often based on source data that are compiled for purposes other than measuring domestic production; as a result, the construction of NSA estimates is similar to the construction of their seasonally adjusted counterparts. Specifically, when NSA source data are available, they are adjusted to align with NIPA conventions. They then provide the indicator or pattern series for the corresponding NSA NIPA estimate (see section below on "Interpolation and extrapolation using an indicator series). When source data are unavailable, most NSA estimates are set equal to their SA counterpart.

The new NSA estimates are presented in Section 8 of the NIPA Interactive Data Tables.[2] For GDP and its major components, the tables present nominal, or "current-dollar" measures, "real," or inflation–adjusted measures (expressed as a chain-type quantity index and as chained 2012 dollars), and price indexes. For GDI and its major components, nominal measures are presented. The quarterly estimates are expressed at quarterly, not annual, rates.[3] In addition, BEA presents the percent change from the same quarter one year ago for real GDP and its major components in NIPA table 8.1.11. The rate of change published for these NSA estimates is calculated from the same quarter 1 year ago to reduce the variations observed from seasonal fluctuations and to reveal data trends over the course of a year. This rate is not comparable to the quarterly rate of change published for BEA's featured seasonally adjusted series, which is calculated from the preceding quarter, and expressed at a compound annual rate. Comparing NSA estimates from the same quarter 1 year ago does not necessarily remove seasonal patterns from the data. Calendar effects, such as the timing of holidays and trading days, as well as other special events can influence the estimates and cause year-over-year comparisons to be misleading. For these reasons, seasonally adjusted statistics are preferred for evaluating growth in BEA's GDP and GDI statistics.

Updates to the new estimates will follow the same publication schedule as the seasonally adjusted statistics.[4]

1. The new NSA estimates are not comparable to BEA's previously published current-dollar GDP NSA estimates, which were discontinued in 2008. The earlier estimates were largely based on SIC-based data and were published once a year as part of the NIPA annual updates. NSA GDI, real GDP, and GDP price estimates were not provided.
2. Prior to the 2018 comprehensive update, BEA presented not seasonally adjusted estimates for federal and state and local government current receipts and expenditures in NIPA tables 3.22 and 3.23; the two tables are now renumbered as tables 8.3 and 8.4, respectively.
3. For more details on the presentation of NIPA estimates, see the section on "Where are the NIPA estimates available?" in chapter 1 of this Handbook. BEA does not publish annual frequency NSA data because the NSA quarterly estimates are reconciled to the seasonally adjusted annual estimates with the annual and comprehensive updates of the NIPAs that occur in July.
4. Prior to the 2018 comprehensive update, the government NSA receipts and expenditures tables 8.3 and 8.4, were published once a year, generally in the fall. With this update, the publication schedule for these tables has been accelerated to be consistent with the release of the government receipts and expenditures seasonally adjusted estimates.

Moving average

A moving average is a calculation that is used to smooth a data series that is characterized by volatile short-term fluctuations. As a result, trend and cyclical movements in the smoothed series will be more apparent, and the series can be better used as an indicator for interpolation and extrapolation (see below).

Table 4.2 illustrates the smoothing effects of a three-quarter moving average on a volatile series. The simple moving average is calculated by summing the value in a given quarter and in the preceding two quarters and dividing by 3 (in year 1:III, (90.0 + 120.0 + 100.0)/3 = 103.3). A weighted moving average is calculated by assigning greater weight to the time periods that are deemed more relevant. In this example, the weighted moving average is calculated by weighting the current quarter at 50 percent, and the two preceding quarters at 25 percent each (in year 1:III, ((90.0 × 0.50) + (120.0 × 0.25) + (100.0 × 0.25) = 100.0).

Table 4.2—Example of Moving-Average Calculation

Time period	Original series	Simple moving average	Weighted moving average
Year 1:I	100.0	…..	…..
Year 1:II	120.0	…..	…..
Year 1:III	90.0	103.3	100.0
Year 1:IV	150.0	120.0	127.5
Year 2:I	170.0	136.7	145.0
Year 2:II	100.0	140.0	130.0
Year 2:III	150.0	140.0	142.5
Year 2:IV	120.0	123.3	122.5

Alternatively, a “centered” three-quarter moving average could be calculated, in which the quarterly value is the average of the value in the current quarter and the values in the preceding quarter and in the following quarter. This would have the effect of shifting the moving-average series back one quarter (in the example, the value of the centered moving average would be 103.3 in year 1:II, and so forth through 123.3 in year 2:III).

Best level and best change

Source data are incorporated into the NIPA estimates on either a "best-level" or a "best-change" basis. Best level provides the most accurate value for an economic statistic at a specified point in time using the best available source data. For example, in a comprehensive update of the NIPAs, data from the quinquennial economic census are incorporated into the estimates on a best-level basis.

However, it is not practical to revise the entire NIPA time series every time new or revised source data become available. Thus, these data are often initially introduced into the estimates on a best-change basis. Best change provides the most accurate measure of the period-to-period movement in an economic statistic using the best available source data. In an annual update of the NIPAs, data from the annual surveys of manufacturing and trade are generally incorporated into the estimates on a best-change basis. In the current quarterly estimates, most of the components are estimated on a best-change basis from the annual levels established at the most recent annual update.

In table 4.3, the original series of source data (column 1) has been revised as shown by the best-level series (column 3). In the example, the level of the series has been revised up in all years, perhaps reflecting a change in definition, and the percent changes in the series have been revised to incorporate new statistical information. In an annual NIPA revision, the revised levels of the source data cannot be fully incorporated, because annual updates only cover the 5 most recent years.[4] As can be seen in this example, incorporating the revised best-level series only for years 2–4 would result in a discontinuity between the unrevised estimate for year 1 (100.0) and the revised estimate for year 2 (115.0) (a 15.0-percent increase rather than the 10.6-percent increase indicated by the source data). To avoid this problem, the revised source data are instead incorporated on a best-change basis—that is, a new best-change series is created by beginning with the value in the unrevised year 1 (100.0) and applying the percent changes in the best-level series (column 4). As a result, the level of the new series (column 5) is kept consistent with the level of the earlier nonrevised year, while the percent changes in the new series (column 6) fully reflect the new statistical information that was incorporated into the source data. In the next comprehensive update, the revised best-levels would be incorporated into the NIPA estimates.

[4] As part of the 2018 comprehensive revision of the NIPAs, BEA changed the typical open period for annual updates of the NIPAs from 3 to 5 years. As part of the "flexible" approach to annual updates that BEA introduced in 2010, the open period may be extended beyond 5 years to allow for the incorporation of improvements in methodology. See Pamela A. Kelly, Stephanie H. McCulla, and David B. Wasshausen, "Improved Estimates of the National Income and Product Accounts: Results of the 2018 Comprehensive Update," Survey 98 (September 2018) and "BEA Briefing: Improving BEA's Accounts Through Flexible Annual Revisions," *Survey* 88 (June 2008): 29–32..

Table 4.3—Simplified Example of "Best Level" and "Best Change"

Year	Original series [billions of dollars] (1)	Percent change in original series (2)	Revised ("best-level") series [billions of dollars] (3)	Percent change in best-level series (4)	Revised ("best-change") series [billions of dollars] (5)	Percent change in best-change series (6)
1	100.0	…..	104.0	…..	100.0	…..
2	110.0	10.0	115.0	10.6	110.6	10.6
3	120.0	9.1	124.0	7.8	119.2	7.8
4	130.0	8.3	136.0	9.7	130.8	9.7

Interpolation and extrapolation using an indicator series

Generally, monthly or quarterly source data are not as comprehensive or as reliable as annual source data (and, similarly, annual source data are not as comprehensive or as reliable as quinquennial source data). Thus, for most estimates, the more frequent but less comprehensive source data may be used as an indicator of the movements of the component series rather than as a measure of the absolute levels of the series. Specifically, for the periods for which annual estimates are available and the quarterly estimates must be forced to average to these annual totals, the quarterly pattern is estimated by *interpolation*. For the periods not yet covered by annual estimates (such as the current quarter), the quarterly estimates are made by *extrapolation*.

The use of an indicator series to estimate a component is illustrated in table 4.4. We begin with a value of \$200 (annual rate) for the fourth quarter of year 1 (this value was determined by the preceding year's calculation) and a value of \$220 for the year 2 (this value was determined from an annual data source). Because the detailed source data are not available on a quarterly basis, the estimates for the quarters of year 2 are interpolated using an indicator series whose movements are deemed to approximate those of the component series. In this simplified example, the interpolation of the quarterly values is accomplished by calculating a time series that begins with the established value (\$200) for the fourth quarter of year 1 and progresses through the four quarters of year 2 at the same rate of change as the indicator series: for year 2:I, \$200 + (\$200 × 0.20) = \$240; for year 2:II, \$240 + (\$240 × –0.167) = \$200; and so forth. As necessary, the calculated series is then adjusted to ensure that the average for the four quarters of year 2 is equal to the established annual value for year 2: for year 2:I, \$240 × (\$220 / \$240) = \$220; for year 2:II, \$200 × (220 / \$240) = \$183.3; and so forth.

Similarly, the estimates for the quarters of the current year, year 3, can be calculated by extrapolating the value for the fourth quarter of year 2 using the percent change in the values for the indicator series as they become available: for year 3:I, \$256.7 + (\$256.7 × 0.20) = \$308.0.

Table 4.4—Simplified Example of Estimation Using an Indicator Series

Time period	Established value	Indicator series	Percent change in indicator series	Calculated value	Adjusted series
Year 1:IV	200	25	…..	…..	
Year 2:I		30	20.0	240	220.0
Year 2:II		25	–16.7	200	183.3
Year 2:III		30	20.0	240	220.0
Year 2:IV		35	16.7	280	256.7
Year 2: Total	220			240	220.0
Year 3:I		42	20.0		308.0

Over time, BEA has used a number of different statistical techniques for interpolation of NIPA time series. Currently, BEA is using a procedure known as the "proportional Denton method" or "quadratic minimization." In its most common application, this approach interpolates series by minimizing the sum of the squared differences of the ratios of the interpolated series and the indicator series. Formally, the interpolation is estimated by the following optimization problem:

$$\min_{x_t} \sum_{t=2}^{4N} \left(\frac{x_t}{z_t} - \frac{x_{t-1}}{z_{t-1}} \right)^2, \qquad s.t. \sum_{t=1}^{4} x_t = A_1, \ldots \sum_{t=4N-3}^{N} x_t = A_N \quad ,$$

where z is the indicator series, x is the interpolated series, A are the annual controls that the interpolated series must sum to, and N is the number of years for the interpolation. This example shows an annual-to-quarterly interpolation. The same method can also be used for annual-to-monthly and quarterly-to-monthly interpolation.[5]

[5] See Baoline Chen and Stephen H. Andrews, "An Empirical Review of Methods for Temporal Distribution and Interpolation in the National Accounts," *Survey* 88 (May 2008): 31–37.

Three special estimation methods

In certain cases where primary source data are not available, one or more of the following special methods—commodity flow, retail control, or perpetual inventory—may be used to estimate values.

Commodity-flow method

The commodity-flow method is generally used to derive estimates in economic census years for various components of consumer spending, equipment and software, and the commodity detail for state and local government consumption expenditures and gross investment. An abbreviated form of this method is used to prepare estimates of investment in equipment in nonbenchmark years, and an even more abbreviated form is used to prepare the current quarterly estimates of investment in equipment.[6]

The commodity-flow method begins with estimates of the domestic output or domestic sales of a commodity valued in producers' prices.[7] Then, estimates of the domestic supply of that commodity—the amount that is available for domestic consumption—are prepared by adding imports and by subtracting exports and inventory change. Next, the domestic supply of the commodity is allocated among domestic purchasers—that is, persons, business, and government. Finally, the estimates are converted to purchasers' prices.[8]

The commodity-flow method is illustrated in table 4.5. First, domestic shipments—the value of shipments of the commodity produced by domestic firms at producers' prices—are converted to net supply, by adding imports and subtracting exports, government purchases, and change in inventories (a positive change in inventories reduces net supply and a negative change in inventories raises net supply) (in the example, \$100 + \$40 – \$10 – \$5 – \$5 = \$120). Portions of the net supply are then allocated among business intermediate purchases and consumer spending. This allocation may be based on relationships from the most recent economic census or on information from other sources (such as spending by consumers as determined by the retail control method). In this example, it is assumed that one-fourth of net supply is allocated to business intermediate purchases and one-sixth to personal consumption expenditures. Investment in equipment (prior to adjustments for transportation costs and wholesale and retail trade margins) is then computed as net supply less business intermediate purchases and consumer

[6] For more information on using the commodity-flow method to prepare the estimates of investment in equipment, see "Chapter 6: Private Fixed Investment" in this handbook.
[7] Producers' prices are the prices received by producers for the goods and services they sell. These prices include sales and excise taxes but exclude domestic transportation costs and trade margins. Trade margins, or markups, reflect the value added by wholesalers and retailers in the distribution of a commodity from producers to final purchasers.
[8] Purchasers' prices are the prices paid by intermediate and final purchasers for the goods and services they buy. These prices are equal to producers' prices plus domestic transportation costs and trade margins.

spending (in the example, $120 – $30 – $20 = $70). This estimate is then converted to purchasers' prices by adding domestic transportation costs and trade margins ($70 + $5 + $10 = $85).

Table 4.5—Simplified Example of Commodity-Flow Calculation

Factors for commodity flow	Values
Output (shipments)	100
Plus: Imports	40
Less: Exports	10
Government purchases	5
Inventory change	5
Equals: Net supply	120
Less: Business intermediate purchases	30
Personal consumption expenditures	20
Equals: Private fixed investment (producers' prices)	70
Plus: Domestic transportation costs	5
Trade margins	10
Equals: Private fixed investment (purchasers' prices)	85

Retail control method

The retail control method uses retail sales data, compiled by the Census Bureau, to estimate annual, quarterly, and monthly consumer spending on most consumer goods in nonbenchmark years. In these years, the estimate of total personal consumption expenditures (PCE) on most goods is derived by extrapolation from the benchmark year using a retail control total of sales by most kinds of business from the Census Bureau's monthly and annual surveys.

In general, product-based data on consumer spending are not available in nonbenchmark years, so the estimates for the detailed PCE categories are prepared by extrapolation using estimates of retail sales by corresponding product lines that, in turn, are based on retail sales by kind of business and on commodity sales data from the most recent quinquennial economic census.[9] Then, the extrapolated estimates are adjusted proportionately so that their sum is equal to that for total PCE.[10]

[9] The estimates for some PCE categories, such as consumer purchases of new and used motor vehicles and of motor vehicle fuels, are prepared independently.
[10] For more information on using the retail control method to prepare the PCE estimates, see "Chapter 5: Personal Consumption Expenditures" in this handbook.

The retail control method is illustrated in table 4.6. First, the PCE control total for year 2 is derived by extrapolation, using the change in the retail control total from year 1 to year 2 (89 × (120 ⁄ 100) = 106.8).

In year 1, a benchmark year, information from the economic census is available to break sales down into product lines (and to corresponding PCE categories) for each kind of business (such as "grocery stores"). In year 2, the annual survey of retail sales provides data on sales by kind of business but not on sales by individual product lines. In order to estimate sales by product line for year 2, the product-line distribution of sales from year 1 is applied to the sales by kind of business for year 2 (for kind of business A, 0.2 × 60 = 12 for product line 1, and 0.8 × 60 = 48 for product line 2). Total sales for each product line are then computed by summing across all kinds of business (for product line 1, 12 + 36 = 48; and for product line 2, 48 + 24 = 72).

The retail sales product lines in the Census Bureau's data and the PCE categories in the NIPAs do not always match (in the example, product line 1 at 44 is larger than PCE category 1 at 33). Thus, the retail sales data are used to extrapolate the PCE estimates for year 2 (for product line 1, 33 × (48 ⁄ 44) = 36). Finally, the PCE category estimates must be adjusted so they sum to the PCE control total for year 2 (for product line 1, the adjusted estimate for year 2 is 36 × (106.8 ⁄ 108) = 35.6).

Table 4.6—Simplified Example of Retail Control Calculation

	Year 1 (economic census)	Product ratios in year 1	Year 2 (annual survey)	Year 2 (calculated values)
Retail control total	100		120	
PCE control total	89			106.8
Retail sale data:				
Kind of business A	40		60	
Product line-1	8	0.2		12
Product line-2	32	0.8		48
Kind of business B	60		60	
Product line 1	36	0.6		36
Product line 2	24	0.4		24
Product-line sales:				
Line 1	44			48
Line 2	56			72
PCE sales data:				
Category 1	33			
Category 2	56			
PCE (summed by category)				108
Category 1				36
Category 2				72
PCE adjusted				106.8
Category 1				35.6
Category 2				71.2

Perpetual inventory method

The perpetual inventory method is used to indirectly derive historical-cost and constant-dollar estimates of net stocks of fixed assets, which, in turn, are used in deriving the NIPA estimates of consumption of fixed capital.[11] For each type of good, the perpetual inventory method calculates the net stock in each year as the cumulative value of gross investment through

[11] Current-cost net stocks and current-cost depreciation (consumption of fixed capital) are derived by converting the corresponding constant-dollar estimates to the prices of the current period.

that year—including both new investment and net purchases of used assets (in order to capture shifts in ownership across NIPA sectors)—less the cumulative value of depreciation through that year. A variation of this method that omits depreciation is used to calculate the stocks of private inventories.

The perpetual inventory method is illustrated in table 4.7 (in this example, it is assumed that asset prices do not change over the course of the year). In year 1, the estimates of the beginning-of-year stocks for two types of assets, A and B, are equal to the end-of-year stocks for the preceding year.[12] For asset A, the end-of-year stock in year 2 is equal to the beginning-of-year stock in year 2 plus the value of investment in asset A during the year minus the value of depreciation during that year ($110 + $20 – $11 = $119).

Table 4.7—Simplified Example of Perpetual Inventory Calculation

	Asset A	Asset B	Total capital stock
Year 1:			
Beginning-of-year stock	100	50	150
Plus: Investment	20	10	
Minus: Depreciation	10	10	
Equals: End-of-year stock	110	50	160
Year 2:			
End-of-preceding-year stock	110	50	160
Plus: Investment	20	5	
Minus: Depreciation	11	10	
Equals: End-of-year stock	119	45	164

[12] The estimates of capital stock are very long time series, so virtually all assets currently in existence have been valued since they were produced.

Quantity and Price Estimates

Estimates for all of the NIPA aggregates and components 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. In the NIPAs, prices and quantities are expressed as index numbers with the reference year—at present, the year 2012—equal to 100. For selected series, quantities—or "real" (inflation adjusted) measures—are also expressed in chained (2012) dollars. (Period-to-period changes in quantities and prices are expressed as percent changes at annual rates; see "Statistical Tools and Conventions" in the appendix to this chapter.)

BEA prepares quantity estimates for GDP and its product-side components and for a few other aggregates and components. (For an illustration of the calculation of these estimates from a set of quantity and price information, see "Calculation of Output and Price Indexes" in the appendix to this chapter.)

Estimates for detailed components

For the detailed NIPA components, the quantity estimates are prepared using one of three methods—deflation, quantity extrapolation, or direct valuation—depending on the availability of source data. The quantity estimates are expressed as real values with 2012 (at present) as the reference year.

Deflation. 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 are obtained by deflation. For deflation, quantities are calculated by dividing the current-dollar value of the component by an "appropriate" price index (with the reference-year value set to 100).[13]

$Q_t = (p_t q_t)/(p_t/p_o)$, where p_t and q_t are observed prices and quantities in the current year and p_o is the observed price in the reference year.

Thus, for example, if the current-dollar value for the component series is \$14 in 2013 and the appropriate price index is 112 in 2013, then the quantity estimate for the component series in 2013 is (\$14 / (112 / 100)), or \$12.50.

The price indexes used for deflation are generally adjusted for changes in characteristics or quality as described in the appendix to this chapter.

[13] A price index is appropriate if its definition and coverage closely match those of the series being deflated.

Quantity extrapolation. The other two methods are similar in that they both are derived using quantity data. Quantity extrapolation is used when a quantity indicator series is available that approximates the movements of the component series. In this method, the quantity estimate is obtained by using the indicator series to extrapolate from the reference-year value.

$Q_t = p_o q_o + ((p_o q_o) \times ((q_t' - q_o')/q_o'))$, where q' represents the quantity indicator series.

For example, if the dollar value of the component series is $10 in 2012 and the quantity indicator series shows an increase of 25 percent in 2013, then the quantity estimate for the component series in 2013 is ($10 + ($10 × 25/100)), or $12.50.

Direct valuation. Direct valuation is used when physical quantity data and price data are available. In this method, the quantity estimate is obtained by multiplying the reference-year price by the actual quantity data for the current year.

$Q_t = p_o q_t$.

For example, if the price of the detailed component is $.50 per unit in 2012 and the quantity measure is 20 units in 2012 and 25 units in 2013, then the quantity estimate for the component series in 2013 is ($.50 × 25), or $12.50.

Estimates for NIPA aggregates

The fundamental problem confronting the efforts to adjust GDP and other aggregates for inflation is that there is not a single inflation number but rather a wide spectrum of goods and services with prices that are changing relative to one another over time. The index numbers for the individual components can be combined statistically to form an aggregate index, but the method of aggregation that is used affects the movements of the resulting index.

In the NIPAs, the annual changes in quantities and prices are calculated using a Fisher formula that incorporates weights from 2 adjacent years.[14] For example, the 2014–2015 change in real GDP uses prices for 2014 and 2015 as weights, and the 2014–2015 change in prices uses quantities for 2014 and 2015 as weights. These annual changes are "chained" (multiplied) together to form time series of quantity and price indexes. Quarterly changes in quantities and prices are calculated using a Fisher formula that incorporates weights from two adjacent

[14] This formula is named after Irving Fisher, who originally developed this index to more accurately measure quantity and price changes over time.

quarters; quarterly indexes are adjusted for consistency to the annual indexes before percent changes are calculated.

The Fisher index (Q_t^F) for calculating real GDP (and other aggregate measures of output and expenditures) in year *t* relative to its value in the previous 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 (and in other measures of output and expenditures) 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 in the form of a ratio is equal to the product of the changes in the Fisher price and quantity indexes:

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

The same formulas are used to calculate the quarterly (and for some components, monthly) chain-type indexes. All quarterly chain-type indexes for completed years that have been included in an annual or comprehensive update are adjusted so that the quarterly indexes average to the corresponding annual index. When an additional year is completed between annual updates, 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 2015 annual update was released, the chain-type indexes for the year 2014 were computed as the average of the four quarterly indexes for 2014.

Properties of chain-type measures

The chain-type indexes based on the Fisher formula have several advantages over the fixed-weighted indexes that BEA used before 1996.[15]

[15] For information on BEA's introduction of chain-type indexes as its featured measure of real output and prices, see J. Steven Landefeld and Robert P. Parker, "Preview of the Comprehensive Revision of the National Income and Product Accounts: BEA's New Featured Measures of Output and Prices," *Survey* 75 (July 1995): 31–38. See also 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; and J. Steven Landefeld, Brent R. Moulton, and Cindy M.

- They produce percent changes in quantities and prices that are not affected by the choice of the reference period.
- They eliminate the substitution bias in measures of real GDP growth that are derived using fixed-weighted indexes. This bias tends to cause an understatement of growth for periods before the reference year and an overstatement of growth for periods after the reference year.
- They eliminate the distortions of growth in components and in industries that result from the fixed-weighted indexes.
- They eliminate the anomalies that arise from using recent-period weights to measure periods in the past when a far different set of prices prevailed. For example, the prices of defense equipment in the 2000s are not appropriate for measuring the real changes in defense spending in the 1940s.
- They eliminate the inconvenience and confusion associated with BEA's previous practice of updating weights and years—and thereby rewriting economic history—about every 5 years.

Despite the greater accuracy provided by the chain-type indexes, users of macroeconomic statistics need more than index numbers and percent changes. The earlier fixed-weighted estimates were denominated in constant dollars, and the real levels for the components of GDP added up to total GDP. Because the system was additive, the shares of the real components reflected their relative importance in total GDP. Similarly, in decomposing total GDP growth by component, the change in constant-dollar values measured the component's contribution to the change in the fixed-weighted aggregate. For GDP and most of its components, BEA prepares estimates in chained dollars as well as chain-type indexes (see the appendix to this chapter). However, because these chained-dollar measures are not based on a single set of weights, they are not additive and thus do not yield accurate measures of shares and contributions to growth.

For real GDP and its major components, BEA provides tables that present accurate estimates of contributions to growth rates that are based on chain-type quantity indexes rather than on the chained-dollar estimates (see the appendix). In addition, BEA provides measures of percentage shares that are based on current-dollar values. Because current-dollar values provide the weights for the chain-type indexes, shares calculated from these estimates rather than from the chained-dollar estimates should be used to indicate the relative importance of components.

Vojtech, "Chained-Dollar Indexes: Issues, Tips on Their Use, and Upcoming Changes," *Survey* 83 (November 2003): 8–16.

APPENDIX

Calculation of Output and Price Indexes

The market (and nonmarket) values used to measure GDP and the other NIPA estimates are in current dollars—that is, they represent the values of transactions taking place in the current time period. In turn, these transactions reflect a combination of physical quantities and prices. As shown in exhibit 4.1, in year 1, 10 apples at a price of $0.20 per apple can be purchased for $2.00. If the transactions in a given time period are compared with those in another time period, the differences in the current-dollar values can be attributed to differences in quantities and to differences in prices. In year 2, 20 apples at a price of $0.25 per apple can be purchased for $5.00. The increase in expenditures from $2.00 to $5.00, or 150 percent, can be separated into quantity and price elements. The quantity of apples purchased increased from 10 to 20, or 100 percent, and the price of apples increased from $0.20 to $0.25 or 25 percent.

Exhibit 4.1

Year 1			
	Expenditures	Quantity	Price
Apples	$2.00	10	$0.20
Oranges	$3.00	30	$0.10
Total fruit	$5.00		
Year 2			
Apples	$5.00	20	$0.25
Oranges	$4.00	20	$0.20
Total fruit	$9.00		

For most NIPA components, estimates of physical quantities are not available. Instead, “real” estimates—that is, estimates that exclude the effects of price change—are derived by “deflating” (dividing) the current-dollar value by appropriate price indexes. In order to prepare such estimates, a statistical application must be used that establishes a common unit price as the basis for comparison. For exhibit 4.1, one way to accomplish this is to value the second-period transaction in the price of the first period: 20 apples at the year 1 price of $0.20 is equal to $4.00, and so the real estimate increases from $2.00 in year 1 to $4.00 in year 2, or 100 percent. Alternatively, the first-period transaction could have been valued in second-period prices: 10 apples at the year 2 price of $0.25 is equal to $2.50, and so the real estimate increases from $2.50 in year 1 to $5.00 in year 2, or 100 percent.

Thus, the separation of current-dollar change into price and quantity elements for a single, detailed component is straightforward. However, for an aggregation of detailed components, price changes and quantity changes cannot be observed directly in the economy. Thus, the partitioning of the current-dollar change into price- and quantity-change elements becomes an analytic process. The price and quantity changes must be calculated, and the calculation method is determined by analytic requirements. Because of the complexity of the interactions of prices and quantities, the method of calculating real estimates for the NIPAs has evolved over time.

Estimates of real GNP and other components were introduced into the NIPAs in the early 1950s as a supplement to the current-dollar estimates. These measures were calculated by specifying a single base period set of prices and then valuing the output of all periods using those prices.

As shown in calculation 1 in exhibit 4.2 (page 4–19), which uses year 1 for valuation, the real estimate for the change in fruit from year 1 to year 2 is 20 percent. This approach, in which the real estimates are calculated moving forward from the base period, is called a "Laspeyres" quantity index. However, the results of the calculation are dependent on the choice of the base year for valuation. In calculation 2, which uses year 2 for valuation, the real estimate for the change in fruit from year 1 to year 2 is 6 percent. This approach, in which the estimates are calculated moving backward from the current period, is called a "Paasche" quantity index. Corresponding calculations can be made to produce Laspeyres and Paasche price indexes.

Before 1996, the real estimates in the NIPAs were calculated as Laspeyres quantity indexes, and the price estimates were calculated as implicit price deflators.[16] In calculation 4, the estimate for the change in the price of fruit from year 1 to year 2 is 50 percent. Note that one property of these estimates is that the index for total expenditures on fruit in year 2 ($9.00 / $5.00, or 1.800) is equal to the Laspeyres quantity index for year 2 multiplied by the Paasche price index for year 2: 1.200 × 1.500 = 1.800.

In 1996, BEA introduced chain-weighted indexes as its featured measure of the change in real GDP and in prices. These indexes, which are based on weights that are more appropriate to the time period being measured, significantly improved the accuracy of the NIPA estimates. The weights for these measures are calculated as the geometric mean of the calculations for the Laspeyres index and the Paasche index (in exhibit 4.1, as the square root of 1.200 × 1.059, or 1.127). Similarly, price measures are computed using weights calculated as the geometric mean of the calculations for the Laspeyres index and the Paasche index (in exhibit 1, as the square root

[16] In the exhibit, all calculations involve only 2 years, so the Paasche price index and the implicit price deflator are equivalent.

of 1.700 × 1.500, or 1.597). Note that for the chain-type measures, the Fisher quantity index for year 2 multiplied by the Fisher price index for year 2 is also equal to the index for total expenditures on fruit in year 2: 1.127 × 1.597 = 1.800.

Note. The material presented in this section is based on the box "Note on Calculating Output and Prices" written by Jack E. Triplett and published in the article "Preview of the Comprehensive Revision of the National Income and Product Accounts: BEA's New Featured Measures of Output and Prices," *Survey of Current Business* 75 (July 1995): 32–33.

Exhibit 4.2

Calculation 1: Laspeyres Quantity Index

Year 1 weighted quantity change measure for fruit: hypothetical expenditure on fruit in year 2 using year 1 prices, divided by actual expenditure on fruit in year 1

$$[(20 \times \$0.20) + (20 \times \$0.10)] / [(10 \times \$0.20) + (30 \times \$0.10)]$$

$$= \$6.00 / \$5.00 = 1.200$$

Calculation 2: Paasche Quantity Index

Year 2 weighted quantity change measure for fruit: actual expenditure on fruit in year 2, divided by hypothetical expenditure on fruit in year 1 using year 2 prices

$$[(20 \times \$0.25) + (20 \times \$0.20)] / [(10 \times \$0.25) + (30 \times \$0.20)]$$

$$= \$9.00 / \$8.50 = 1.059$$

Calculation 3: Laspeyres Price Index

Year 1 weighted price change measure for fruit:

$$[(10 \times \$0.25) + (30 \times \$0.20)] / [(10 \times \$0.20) + (30 \times \$0.10)]$$

$$= \$8.50 / \$5.00 = 1.700$$

Calculation 4: Paasche Price Index

Year 2 weighted price change measure for fruit:

$$[(20 \times \$0.25) + (20 \times \$0.20)] / [(20 \times \$0.20) + (20 \times \$0.10)]$$

$$= \$9.00 / \$6.00 = 1.500$$

Adjusting for quality change

Accurate price indexes are crucial for preparing accurate estimates of real GDP as well as corresponding productivity measures. The illustrations shown above assume that there are changes only in the prices and quantities of the goods or services being measured. The development of a price index becomes more complicated when the characteristics or quality of the goods or services are also changing. In these cases, the price index must isolate and measure

only the price change and not the impacts of these other changes. There are several methods used to construct price indexes, and while most of these are designed to measure price change while holding quality constant, no method is perfect in every situation.[17] Traditional matched model indexes, which hold quality constant by specifying each variety in the sample and ensuring that exactly the same variety of product is sampled each period, work well with relatively standardized products. However, these indexes are less accurate when the characteristics, quality, market shares, and prices are changing rapidly. In such cases, alternative methods for quality adjustment may yield more accurate measures. The attribute-cost adjustment method, adopted recently by the Bureau of Labor Statistics (BLS) to construct the consumer price index (CPI) for computers, uses monetary values of the attributes that affect price, obtained from the original equipment manufactures or from price compiler websites, to determine appropriate quality adjustments.[18] The hedonic method uses regression analysis to determine statistical relationships between observed price changes and changes in the characteristics and qualities of the products, and these relationships are used to hold quality constant; this method is used by BLS in many of its producer and consumer price indexes and by the Census Bureau in its housing construction and sales price indexes. Both techniques have been shown to produce price indexes that are more accurate than traditional matched model indexes in cases of rapid change.[19] BEA's primary source of indexes to deflate GDP and its components is BLS, which provides detailed price indexes—including consumer price indexes, producer price indexes, and international price indexes. These indexes, as well as other indexes from BLS, the Census Bureau, and other federal agencies, all employ methodologies to adjust for quality change. In cases where quality-adjusted indexes have not been available, BEA has developed its own indexes. For example, for a number of years in the 1980s and early 1990s, BEA produced hedonic indexes for computers; as BLS began publishing quality-adjusted PPIs for computers and peripheral equipment in the 1990s, BEA adjusted its methodologies to incorporate them. In the late 1990s, BEA introduced quality-adjusted price indexes for semiconductors, for digital telephone switching equipment, and for computer software; more recently, BEA has introduced a hedonic price index for photocopying equipment.[20]

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[17] An exception is a unit value index, which measures the change in the value of items without holding characteristics, quality, or even the mix of items constant.

[18] For more information on how BLS calculates the CPI for computers, see https://www.bls.gov/cpi/factsheets/personal-computers.htm.

[19] For more information on the hedonic method underlying producer and consumer price indexes, see Chapter 14, Producer Prices, and chapter 17, The Consumer Price Index, of the BLS Handbook of Methods. For more information on the hedonic method underlying housing price indexes, see the information available on the Census website at https://www.census.gov/construction/cpi/.

[20] For more information these quality-adjustment techniques, see "Prices and Output for Information and Communication Technologies," on BEA's website.

Statistical Tools and Conventions

This section describes some of the statistical tools and conventions that BEA uses in preparing and presenting the NIPA estimates. In general, these statistical operations are used to transform the estimates into alternative formats that facilitate analytical or presentational uses.

Chained-dollar measures

As a supplement to its chain-type quantity indexes, BEA prepares measures of real GDP and its components in a dollar-denominated form, designated "chained (2012) dollar" estimates. For GDP and most other series, the chained-dollar value CD_t^F is calculated by multiplying the reference year current-dollar value $\sum p_b q_b$) by the chain-type Fisher quantity index (I_t^F) and dividing by 100. For period *t*,

$$CD_t^F = \sum p_b q_b \times I_t^F / 100 .$$

Thus, for example, if a current-dollar GDP component is equal to $200 in 2012 and if the quantity index for this component increased 15 percent by 2015, then the chained (2012) dollar value of this component in 2015 would be $200 x 115⁄100, or $230.

The chained (2012) dollar 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; any differences are small and due to rounding. For most components of GDP, the chained-dollar estimates also provide rough approximations of their relative importance and of their contributions to real GDP growth for years close to 2012. However, for components—such as computers and other high-tech equipment—with rapid growth in real output and sharply falling prices, the chained-dollar levels (as distinct from chain-weighted indexes and percent changes) will overstate their relative importance to GDP growth.

In addition, chained-dollar values for the detailed GDP components will not necessarily sum to the chained-dollar estimate of GDP (or of any intermediate aggregate), because the relative prices used as weights for any period other than the reference year differ from those used for the reference year. BEA provides a measure of the extent of such differences by showing a "residual" line on chained-dollar tables that indicates the difference between GDP (and other major aggregates) 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 calculating the chain-type index, the residuals

tend to be small, and the chained (2012) dollar estimates can be used to approximate the contributions to growth and to aggregate the detailed estimates. However, it is preferable to use estimates of exact contributions, which are described in the next section.

Some exceptions to the above methodology are made for a few components of GDP. For cases in which the components of an aggregate include large negative values, the Fisher formula cannot be used because it would require taking the square root of a negative number. In such cases, one of two other methods is used.

- Quantity estimates are calculated as the sum of, or as the difference between, chained-dollar series that measure flows. For example, real net exports is derived as the difference between real exports and real imports.
- Quantity estimates are calculated as the difference between measures of chain-weighted stocks. For example, the real annual change in private inventories is derived as the difference between real beginning-of-year inventories and real end-of-year inventories.

The inability to calculate a particular Fisher quantity index (for example, for 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 chain-dollar estimates are used in the calculation of another price index, the *implicit price deflator* (IPD). The 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:

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

For all aggregates and components and for all time periods, the value of the IPD is very close to the value of the corresponding chain-type price index. Note that this definition of the IPD differs from that used before the introduction of chain-type measures in1996, when the IPD was defined as the ratio of the current-dollar value to the corresponding constant-dollar value.

Contributions to percent change

As one moves further away from the reference year, the residual tends to become larger, and the chained-dollar estimates are less useful for analyses of contributions to growth. For this

reason, BEA also shows contributions of major components to the percent change in real GDP (and to the percent change in other major aggregates) that use exact formulas for attributing growth.

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 nonadditivity of its components. This property makes contributions to percent change a valuable tool for economic analysis. The contribution to percent change ($C\%\Delta_{i,t}$) in an aggregate in period *t* that is attributable to the quantity change in component *i* is defined by the formula

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

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 subaggregate.[21]

For annual estimates, no adjustments are required for the contributions to sum exactly to the percent change in the aggregate. For quarterly estimates, adjustments are required to offset the effects of adjustments that were made to equate the average of the quarterly estimates to the corresponding annual estimate and to express the 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 the annual contributions for the most recent year are based on a weighted average of the quarterly contributions until the next annual update.

[21] See Marshall B. Reinsdorf, W. Erwin Diewert, and Christian Ehemann, "Additive Decompositions for Fisher, Tornqvist, and Geometric Mean Indexes," *Journal of Economic and Social Measurement* 28 (2002): 51–61, www.econ.ubc.ca/diewert/additive.pdf.

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 level of activity measured for a quarter or for 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).

Growth rates

In general, percent changes in the NIPA estimates are also expressed at annual rates, which show the value that would be registered if the pace of activity measured for a time period were maintained for a full year.[22] Calculating these changes requires a variant of the compound interest formula,

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

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 and 4 for quarterly data); and
n is the number of periods between the earlier and later periods (that is, t-0).

Thus, for example, if a component increases from $100 in the first quarter to $105 in the second quarter (5 percent at a quarterly rate), the annual rate of increase is $(\$105/\$100)^{4/1} - 1) \times 100 =$ 21.6 percent.

Rebasing an index

In the NIPAs, quantities and prices are generally expressed as index numbers with a reference year—at present, the year 2012—equal to 100. These indexes can easily be rebased to a different reference year without changing the relationship between the series values. To rebase,

[22] The growth rates in the NIPA monthly series, such as personal income, are not expressed at annual rates.

divide the entire index by the index value of the desired reference year. As illustrated in table 4.8, the original index is rebased from year 1 to year 2 by dividing each of the original index values by the index value in year 2 (for year 1, 100.0 / 110.0 = 90.9). Note that the year-to-year percent changes are unaffected by the rebasing.

Table 4.8—Example of Index Rebasing

Year	Original index	Percent change	Rebased index	Percent change
1	100.0	…..	90.9	…..
2	110.0	10.0	100.0	10.0
3	120.0	9.1	109.1	9.1
4	130.0	8.3	118.2	8.3

CHAPTER 5: PERSONAL CONSUMPTION EXPENDITURES

(Updated: December 2020)

Definitions and Concepts
Recording in the NIPAs
Overview of Source Data and Estimating Methods
- Benchmark-year estimates
- Nonbenchmark-year estimates
- Current quarterly and monthly estimates
- Quantity and price estimates

Table 5.A—Summary of Methodology for PCE for Goods
Table 5.B—Summary of Methodology for PCE for Services
Technical Note: Special Estimates
- New motor vehicles
- Net purchases of used motor vehicles
- Gasoline and other motor fuel
- Rental of tenant- and owner-occupied nonfarm housing
- Financial service charges and fees
- Securities commissions
- Financial services furnished without payment
- Life insurance
- Property and casualty insurance
- Nonprofit institutions serving households

Personal consumption expenditures (PCE) is the primary measure of consumer spending on goods and services in the U.S. economy.[1] It accounts for about two-thirds of domestic final spending, and thus it is the primary engine that drives future economic growth. PCE shows how much of the income earned by households is being spent on current consumption as opposed to how much is being saved for future consumption.

PCE also provides a comprehensive measure of types of goods and services that are purchased by households. Thus, for example, it shows the portion of spending that is accounted for by discretionary items, such as motor vehicles, or the adjustments that consumers make to changes in prices, such as a sharp run-up in gasoline prices.[2]

In addition, the PCE estimates are available monthly, so they can provide an early indication of the course of economic activity in the current quarter. For example, the PCE

[1] For a comprehensive presentation of BEA's information on PCE, see "Consumer Spending" on BEA's website at www.bea.gov. .

[2] For a long-term look at consumer spending, see Clinton P. McCully, "Trends in Consumer Spending and Personal Saving, 1959–2009," *Survey of Current Business* 91 (June 2011): 14–21.

estimates for January are released at the end of February, and the estimates for February are released at the end of March; the advance estimates of gross domestic product (GDP) for the first quarter are released at the end of April.

The PCE estimates are an integral part of the U.S. national income and product accounts (NIPAs), a set of accounts that provides a logical and consistent framework for presenting statistics on U.S. economic activity (see "Chapter 2: Fundamental Concepts").

Definitions and Concepts

PCE measures the goods and services purchased by "persons"—that is, by households and by nonprofit institutions serving households (NPISHs)—who are resident in the United States. Persons resident in the United States are those who are physically located in the United States and who have resided, or expect to reside, in this country for 1 year or more. PCE also includes purchases by U.S. government civilian and military personnel stationed abroad, regardless of the duration of their assignments, and by U.S. residents who are traveling or working abroad for 1 year or less.

Table 5.1 shows the kinds of transactions that are included in and excluded from PCE. Most of PCE consists of purchases of new goods and of services by households from private business. In addition, PCE includes purchases of new goods and of services by households from government and government enterprises, the costs incurred by NPISHs in providing services on behalf of households, net purchases of used goods by households, and purchases abroad of goods and services by U.S. residents traveling, working, or attending school in foreign countries. PCE also includes expenditures financed by third-party payers on behalf of households, such as employer-paid health insurance and medical care financed through government programs, and it includes expenses associated with life insurance and with private and government employee pension plans. 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 or whether employees are paid in cash or in kind. PCE transactions are valued in market prices, including sales and excise taxes.

In the NIPAs, final consumption expenditures by NPISHs is the portion of PCE that represents the services that are provided to households by NPISHs without explicit charge (such as the value of the education services provided by a nonprofit college or university that is over and above the tuition and other costs paid by or for the student's household). It is equal to their gross output, which is measured as their current operating expenses (not including purchases of buildings and equipment, which are treated as private fixed investment), less their sales to households and to other sectors of the economy (such as sales of education services to employers) and less the value of any investment goods (such as software) that are produced directly by the NPISH. Services that are provided by NPISHs and are paid by or on behalf of households (such as the tuition and other costs) are already accounted for in PCE as purchases by households. (For more information, see the section on NPISHs in the technical note at the end of this

chapter.)

Table 5.1—Content of PCE

Category of expenditure	Comments
Market-based purchases of new goods and of services by households from business, from government, and from nonprofit institutions serving households (NPISHs) and purchases of the services of paid household workers	Includes the full value of financed purchases. Includes net outlays for health and casualty insurance. Includes direct and indirect commissions on securities transactions. Includes purchases directly financed by government social benefits, such as Medicaid. Excludes services (other than owner-occupied housing) that are produced by households for their own use. Excludes expenses associated with operating an unincorporated business. Excludes services provided directly at government-owned facilities (such as Veterans' Administration hospitals). Excludes finance charges. Excludes purchases of dwellings and major improvements to dwellings. Excludes expenses associated with owner-occupied housing—such as maintenance and repair, mortgage financing, and property insurance. Excludes purchases of illegal goods and services.
Costs incurred by NPISHs in providing services to households less sales by NPISHs to households (final consumption expenditures by NPISHs)	Costs consist of current operating expenses, including consumption of fixed capital. Excludes purchases of structures and equipment.
Net purchases of used goods by households from business and from government	Transactions between households are not reflected in PCE because they cancel in the aggregation of the personal sector.
Purchases of goods and services abroad by U.S. residents	These transactions are included in PCE in the category "foreign travel and other, net." They are not included in the various detailed PCE components.
Purchases imputed to keep PCE invariant to whether: Housing and institutional structures and equipment are rented or owned Employees are paid in cash or in kind Farm products are sold or consumed on farms Saving, lending, and borrowing are direct or are intermediated Financial and insurance service charges are explicit or implicit	Estimates for the following PCE components are entirely imputed: the space rent of nonfarm owner-occupied housing, farm products consumed on farms, wages and salaries paid in kind, private workers' compensation, services furnished without payment by financial intermediaries except life insurance carriers, and the expenses associated with life insurance and pension plans. Other imputations include the imputed rental value of buildings and equipment owned and used by NPISHs (included in their current operating expenditures), the space rent of owner-occupied farm housing (included in the rental value of farm housing), the imputed value of employer-paid medical care and hospitalization insurance, and the imputed value of premium supplements for property and casualty insurance.

PCE records purchases for personal use by U.S. residents, wherever the purchases take place. Thus, the payments by U.S. residents to foreign residents for passenger fares and travel services and the purchases by U.S. residents while traveling, working, or attending school outside the United States are included in PCE—though they are not included in U.S. production. In PCE, these expenditures are recorded collectively as "Foreign travel by U.S. residents" in the category "Net foreign travel"; they are not

distributed among the individual PCE categories.[3] In the NIPAs, these expenditures are also recorded as imports of goods and services; thus, the PCE and import entries cancel out in deriving GDP.[4]

Conversely, the payments by foreign residents to U.S. residents for travel services and the purchases by foreign residents while traveling, working, attending school, or receiving medical treatment in the United States are not included in PCE—though they are included in U.S. production. However, these expenditures are included in the source data that underlie the estimates of most individual PCE categories, where they are indistinguishable from expenditures made by U.S. residents.[5] In order to exclude these expenditures from PCE, they are recorded collectively as "Less: Expenditures in the United States by nonresidents" in the category "Net foreign travel"; this entry negates the expenditures by foreign residents that are embedded in the source data. In the NIPAs, the expenditures by foreign residents are also recorded as exports of goods and services; thus, they are included in deriving GDP.

PCE is classified by type of product as follows.[6] *Goods* consist primarily of tangible commodities that can be stored or inventoried, but they also include certain intangible products, such as software. *Durable goods* are goods that have an average useful life of at least 3 years. *Nondurable goods* are goods that have an average useful life of less than 3 years. *Services* are commodities that cannot be stored or inventoried and that are usually consumed at the place and time of purchase.

. This system reflects long-term changes in consumption patterns due to shifts in consumer demographics, income, and tastes; to the increased importance of services; and to the introduction of a wide variety of new products. The system follows recommendations for the classification of household and nonprofit consumption by the international System of National Accounts (SNA), thus maintaining consistency with international standards.

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[3] For the results of research aimed at better separating spending by nonresidents from spending by U.S. residents in the detailed PCE statistics, see Michael Armah and Teresita Teensma, "Research Spotlight: Estimates of Categories of Personal Consumption Expenditures Adjusted for Net Foreign Travel Spending," *Survey* 92 (April 2012): 13–21.

[4] The portions of travel and passenger fare imports accounted for by business and by government are not offset in PCE. Rather, these purchases are recorded as business intermediate expenditures and as government consumption expenditures, respectively.

[5] Passenger fares paid by foreign residents to U.S. carriers for transportation to and from the United States are not included in any of the PCE categories; these expenditures are recorded as exports in the NIPAs. Foreign residents' expenditures for transportation within the United States are recorded in both exports and PCE for public transportation.

[6] The classification system for PCE was introduced as part of the 2009 comprehensive update of the NIPAs, BEA introduced a new classification system for PCE. See Clinton P. McCully and Teresita D. Teensma, "Preview of the 2009 Comprehensive Revision of the National Income and Product Accounts: New Classifications for Personal Consumption Expenditures," *Survey* 88 (May 2008): 6–17.

PCE by type of product is classified into the following broad categories:

- Durable goods: motor vehicles and parts, furnishings and durable household equipment, recreational goods and vehicles, and other durable goods.
- Nondurable goods: food and beverages purchased for off-premises consumption, clothing and footwear, gasoline and other energy goods, and other nondurable goods.
- Services: housing and utilities, health care, transportation services, recreation services, food services and accommodations, financial services and insurance, and other services.

PCE by function is classified into the following broad categories:

- Food and beverages purchased for off-premises consumption
- Clothing, footwear, and related services
- Housing, utilities, and fuels
- Furnishings, household equipment, and routine household maintenance
- Health
- Transportation
- Communication
- Recreation
- Education
- Food service and accommodations
- Financial services and insurance
- Other goods and services
- Net foreign travel and expenditures abroad by U.S. residents

In addition, household consumption expenditures and the final consumption expenditures of NPISHs are shown separately in the PCE tables. Household consumption expenditures comprise purchases from business, government, and the rest of the world and from NPISHs (which are included in the health, recreation, education, and "other goods and services" categories). Final consumption expenditures of NPISHs are measured as gross output less own-account investment and less sales to households and other sectors (see the technical note).

Recording in the NIPAs

As described in chapter 2, the NIPAs can be viewed as aggregations of accounts belonging to individual transactors in the economy. Thus, PCE represents the final demand for goods and services by households and NPISHs. In the seven summary accounts of the NIPAs, PCE appears in the Domestic Income and Product Account (Account 1), where it is the largest component of final demand, and in the Personal Income and Outlay Account (Account 3), where it is the dominant outlay.

In the NIPAs, PCE by major type of product is presented in NIPA table group 2.3,

and more detailed information by type of product is presented in NIPA table group 2.4. This presentation is based on the classification of the PCE categories into durable goods, nondurable goods, and services (for more information, see the section "Type of product" in chapter 2). PCE by function is presented in NIPA table group 2.5. This presentation is based on the classification of the PCE categories into broad expenditure categories (for more information, see "Function" in chapter 2). PCE by type of product on a monthly basis is presented in NIPA table group 2.8. In addition, separate annual estimates for the income and outlays of households and of NPISHs are provided in NIPA table group 2.9.

The following is a list of the principal NIPA tables that present the PCE estimates:

2.3.1 Percent Change From Preceding Period in Real Personal Consumption Expenditures by Major Type of Product
2.3.2 Contributions to Percent Change in Real Personal Consumption Expenditures by Major Type of Product
2.3.3 Real Personal Consumption Expenditures by Major Type of Product, Quantity Indexes
2.3.4 Price Indexes for Personal Consumption Expenditures by Major Type of Product
2.3.5 Personal Consumption Expenditures by Major Type of Product
2.3.6 Real Personal Consumption Expenditures by Major Type of Product, Chained Dollars
2.3.7 Percent Change from Preceding Period in Prices for Personal Consumption Expenditures by Major Type of Product
2.4.3 Real Personal Consumption Expenditures by Type of Product, Quantity Indexes
2.4.4 Price Indexes for Personal Consumption Expenditures by Type of Product
2.4.5 Personal Consumption Expenditures by Type of Product
2.4.6 Real Personal Consumption Expenditures by Type of Product, Chained Dollars
2.5.3 Real Personal Consumption Expenditures by Function, Quantity Indexes
2.5.4 Price Indexes for Personal Consumption Expenditures by Function
2.5.5 Personal Consumption Expenditures by Function
2.5.6 Real Personal Consumption Expenditures by Function, Chained Dollars
2.8.1 Percent Change From Preceding Period in Real Personal Consumption Expenditures by Major Type of Product, Monthly
2.8.3 Real Personal Consumption Expenditures by Major Type of Product, Monthly, Quantity Indexes
2.8.4 Price Indexes for Personal Consumption Expenditures by Major Type of Product, Monthly
2.8.5 Personal Consumption Expenditures by Major Type of Product, Monthly
2.8.6 Real Personal Consumption Expenditures by Major Type of Product, Monthly, Chained Dollars
2.8.7 Percent Change from Preceding Period in Prices for Personal Consumption Expenditures by Major Type of Product, Monthly
2.9 Personal Income and Its Disposition by Households and by Nonprofit Institutions Serving Households

BEA also prepares estimates of PCE that are not seasonally adjusted; these are available in

Section 8 of the NIPA Interactive Data Tables. The tables present nominal, or "current-dollar" measures, "real," or inflation-adjusted measures, and price indexes.

Additionally, BEA prepares "Underlying Detail Tables" for PCE by type of product that provide current-dollar, chained-dollar, and price estimates at a greater level of detail than are shown in the above tables. BEA does not include these detailed estimates in the published tables because their quality is significantly lower than that of the higher-level categories of which they are a part. In particular, these detailed estimates are more likely to be based on judgmental trends or on less reliable source data.

Overview of Source Data and Estimating Methods

As described earlier, the NIPA estimates, including those for PCE, are prepared using a wide variety of source data (see "Chapter 3: Principal Source Data") and using estimating methods that adjust the source data to the required NIPA concepts and that fill in gaps in coverage and timing (see "Chapter 4: Estimating Methods"). For PCE, the estimates are based on statistical reports, primarily from the U.S. Census Bureau but also from other government agencies; on administrative and regulatory agency reports; and on reports from private organizations, such as trade associations. The following are among the principal source data used for the PCE estimates: BEA's Benchmark Input-Output (I-O) Accounts, which are based primarily on the Census Bureau's Economic Censuses, and BEA's International Transactions Accounts; the Census Bureau's Annual Retail Trade Survey, Service Annual Survey, Quarterly Services Survey, and Monthly Retail Trade Survey; and the Bureau of Labor Statistics' Consumer Price Indexes.

Tables 5.A (PCE for goods) and 5.B (PCE for services) following the main text summarize the source data and estimating methods that are used to prepare the current-dollar benchmark, nonbenchmark, and current quarterly estimates and the quantity and price estimates for the categories of PCE as shown by type of product in NIPA table group 2.4. The source data and methods for the current quarterly estimates reflect both seasonally adjusted and not seasonally adjusted estimates unless otherwise noted.

Benchmark-year estimates

The source data used for the PCE estimates are complete only for "benchmark" years—that is, years in which the benchmark I-O accounts are used to establish the level of PCE and of its components during a comprehensive update. The I-O accounts show the domestic output of each commodity and its disposition—either as intermediate consumption by industries or as purchases by final users, including consumers. In the I-O accounts, PCE is presented as the sum of detailed commodities—goods and services—purchased by persons.[7] These commodities are then grouped into the PCE categories

[7] For more information on the preparation of the I-O benchmark accounts, see U.S. Bureau of Economic Analysis, *Concepts and Methods of the U.S. Input-Output Accounts*, April 2009 available on BEA's website at www.bea.gov.

shown in the NIPA tables.[8]

Two methods are used in preparing the benchmark estimates of PCE: commodity-flow and direct estimation. Direct estimates are made for the PCE categories that, by definition, are purchased only by persons: food furnished to employees (including the military and food produced and consumed on farms), standard clothing issued to military personnel, net expenditures abroad by U.S. residents, the rental value of owner- and tenant-occupied dwellings, services of workers employed by households, health insurance, and expense of handing life insurance and pension plans. In addition, direct estimates are made for expenditures in the United States by nonresidents—which include personal, business, and government expenditures and which are subtracted in their entirety in determining PCE.

For most PCE categories, purchases by persons are estimated using the commodity-flow method (see the section "Commodity-flow method" in chapter 4). Generally, this method begins with the value of domestic output based on data from the economic census—such as manufacturers' shipments for most goods, revenue for utilities, receipts for most services, and commissions for securities brokerage.[9] Next, the domestic supply of each commodity—the amount available for domestic consumption—is estimated by adding imports and subtracting exports and inventory change. Then, this supply, denominated in producers' prices, is allocated among domestic purchasers. The value of consumer purchases is then converted from producers' prices to purchasers' prices by adding wholesale margins and taxes, transportation costs, and retail margins and taxes.[10] For some categories, variations of this method are used. For new motor vehicles and for motor vehicle fuels, the domestic supply is converted to purchasers' prices and then allocated among persons, business, and government based on trade source data. For electricity and for natural gas, residential revenue data provide direct estimates of purchases by persons. For prescription drugs, retail and health services sales from the economic census are allocated to PCE using Census Bureau data on sales by class of customer. For purchased meals and beverages (excluding school sales), food services sales from the economic census are allocated to PCE by type of eating place.

[8] A complete listing of the commodities underlying each PCE product category is available in the FAQ "What is the I-O commodity composition of the National Income and Product Accounts (NIPA) PCE categories?"

[9] Three adjustments are made to the economic census data to bring the coverage of industries to levels that reflect all of their economic activities. The *nonemployer adjustment* extends the economic census coverage to establishments without employees or payrolls. The *tax-misreporting adjustment* corrects for the underreporting of income and for illegal nonfiling or late filing of tax returns. The *tips or gratuity adjustment* corrects for underreporting of receipts in certain industries, such as accommodation, food services, taxi services, and beauty salons. For more information, see *Concepts and Methods of the U.S. Input-Output Accounts*, chapter 5, pages 6–7.

[10] See *Concepts and Methods of the U.S. Input-Output Accounts*, chapter 8.

Nonbenchmark-year estimates

In years other than the benchmark years, the PCE estimates are mainly prepared using indicator series to represent the pattern of expenditures (see the section "Interpolation and extrapolation using an indicator series" in chapter 4). The estimates for most categories of PCE goods are prepared using the retail control method. The estimates for the remaining categories—motor vehicles; food furnished to employees; food produced and consumed on farms; tobacco; standard clothing issued to military personnel; motor vehicle fuels, lubricants, and fluids; and net expenditures abroad by U.S. residents—are prepared separately (see tables 5.A and 5.B; for motor vehicles and motor vehicle fuels, see also the technical note).

The *retail control method* provides the indicator series used in interpolating and extrapolating the total for most goods, and it provides the "control total" to which the categories included in the retail control group must sum. This method is implemented as follows:

1. The estimate of total PCE for most goods is derived by extrapolation from the benchmark-year estimate using a retail control total of sales by most kinds of business from the annual retail trade survey.
2. The estimates for prescription drugs are prepared by extrapolation using data from IMS Health Inc.
3. The estimates for audio discs, tapes, vinyl, and permanent digital downloads are prepared by extrapolation using data from the Recording Industry Association of America.
4. The estimates for the rest of the detailed PCE categories are prepared by extrapolation using estimates of retail sales by corresponding product lines that, in turn, are based on commodity sales data from the most recent economic census. For goods bought at grocery stores, the economic census allocations are updated annually using retail point-of-sale scanner data from Information Resources, Inc.[11] For goods bought at radio, television, and electronics stores, at computer and software stores, and at camera and photographic supply stores, the allocations are updated using retail point-of-sale scanner data from NPD Group.[12] For goods bought at electronic shopping and mail order retailers, the allocations are updated using annual merchandise line sales from the Census Bureau E-commerce Report and retail point-of-sale scanner data from NPD Group.
5. The expenditures estimates for the categories in step 3 are adjusted proportionately so that their sum plus the expenditures for prescription drugs and for audio discs, tapes, vinyl, and permanent digital downloads is equal to the retail control total in step 1.

(For a general illustration of this method, see the section "Retail control method"

[11] See Eugene P. Seskin and Shelly Smith, "Annual Revision of the National Income and Product Accounts," *Survey* 88 (August 2008): 18.
[12] See Clinton P. McCully and Steven Payson, "Preview of the 2009 Comprehensive Revision of the NIPAs: Statistical Changes," *Survey* 89 (May 2009): 9.

in chapter 4.)

A variety of sources and methods are used to construct the indicator series for the PCE services categories. For many services, the service annual survey is the primary data source.

Current quarterly and monthly estimates

The seasonally adjusted current dollar quarterly and monthly estimates for most PCE categories are prepared by using seasonally adjusted indicator series to extrapolate from the annual estimates. Most goods categories are estimated by the retail control method using data on retail sales from the monthly retail trade survey (MRTS).[13] The rest of the goods categories are estimated using other indicator series.

For many services categories, the indicator series are based on data from the Census Bureau's Quarterly Services Survey. For the remaining categories, the current estimates are extrapolated based on other source data or on judgmental trends. In general, the real-dollar series for these categories are extrapolated using the rate of change in population and a projected rate of change in real per capita consumption based on the results of the most recent NIPA annual update. The real-dollar estimates are then converted to current dollars using the appropriate monthly price indexes.

The not seasonally adjusted estimates are derived using the same methods as the seasonally adjusted estimates, using the not seasonally adjusted versions of the same indicators.

Quantity and price estimates

The estimates of quantities purchased, or real spending, for most of the detailed PCE categories are prepared by deflation. In this method, the quantities are calculated by dividing the current-dollar value of the component by an appropriate price index (with the reference-year value set to 100). For most PCE categories, the closest matching price index is a consumer price index or indexes. In addition, the quantity estimates for some detailed components are prepared by quantity extrapolation or by direct valuation. (For descriptions of the three methods, see the section "Estimates for detailed components" in chapter 4.)

The aggregate PCE measures are calculated from the detailed components as chain-type quantity and price indexes (for information about these calculations, see the section "Estimates for NIPA aggregates" in chapter 4). BEA also prepares measures of real PCE and its components in a dollar-denominated form, designated "chained-dollar" estimates (see "Chained-dollar measures" in chapter 4).

[13] For the advance quarterly estimate, the source data for the third month are from the Census Bureau's advance monthly retail sales survey because the MRTS data are not yet available.

Table 5.A—Summary of Methodology Used to Prepare Estimates of PCE for Goods

Line in NIPA table group 2.4	Component	Current-dollar estimates				Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates**	
2	**Goods:**					
3	**Durable goods:**					
4	Motor vehicles and parts:					
5	New motor vehicles [For more detail, see the technical note "Special Estimates."]	Based on unit data from *Wards' Automotive Reports* and registration data from R.L. Polk & Co. times average price data from J.D. Power and Assoc.	Same as for benchmark year.	Same as for benchmark year.	Same as for benchmark year.	CPI for new cars and CPI for new trucks.
6	Net purchases of used motor vehicles [For more detail, see the technical note "Special Estimates."]	Dealers' margins: retail sales from EC and margin rate from ARTS. Net transactions: commodity-flow method, starting with manufacturers' shipments from EC.	Dealers' margins: extrapolation based on Census gross margins for used vehicle dealers and wholesale margins for motor vehicle and motor vehicle parts and supplies, except MSBOs. Net transactions: quantities based on vehicles in operation data from R.L. Polk & Co. and average prices based on National Automobile Dealers Association (NADA).	Dealers' margins: extrapolation based on retail sales of used vehicle dealers from MRTS. Net transactions: same as for nonbenchmark year.	Dealers' margins: same as for most recent year. Net transactions: extrapolation by retail sales of used vehicle dealers from MRTS.	Dealers' margins: PPI for used vehicle sales at new car dealers. Net transactions: CPI for used cars and trucks. .
7	Motor vehicle parts and accessories	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for tires and CPI for vehicle parts and equipment other than tires.
8	Furnishings and durable household equipment:					
9	Furniture and	Commodity-flow method,	Retail control method, using	Retail control	Same as for most	CPI for furniture and bedding,

Table 5.A—Summary of Methodology Used to Prepare Estimates of PCE for Goods

Line in NIPA table group 2.4	Component	Current-dollar estimates				Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates**	
	furnishings	starting with manufacturers' shipments from EC.	retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	method, using retail sales from MRTS.	recent year.	CPI for clocks, lamps, and decorator items, CPI for floor coverings, and CPI for window coverings.
10	Household appliances	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for major appliances and CPI for other appliances.
11	Glassware, tableware, and household utensils	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for dishes and flatware and CPI for nonelectric cookware and tableware.
12	Tools and equipment for house and garden	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for tools, hardware, and supplies and CPI for outdoor equipment and supplies.
13	Recreational goods and vehicles:					
14	Video, audio, photographic, and information processing equipment and media	Commodity-flow method, starting with manufacturers' shipments from EC. For computers/tablets, peripherals, and software, the consumer share is based on retail "class of customer" data from EC.	For most components, retail control method, using retail sales from ARTS. For audio discs, tapes, vinyl, and permanent digital downloads, Recording Industry Association of America industry data on sales of physical music and permanent digital downloads. Composition of goods sold partly based on scanner data from NPD group and Census E-commerce Report.	For most components, retail control method, using retail sales from MRTS. For audio discs, tapes, vinyl, and permanent digital downloads, same as for nonbenchmark year.	For most components, same as for most recent year. For audio discs, tapes, vinyl, and permanent digital downloads, extrapolated using Nielsen quantity data on music sales times the CPI for recorded music and music subscriptions.	CPI for televisions, CPI for other video equipment, CPI for audio equipment, CPI for recorded music and music subscriptions, CPI for video discs and other media, CPI for photographic equipment, CPI for personal computers and peripheral equipment, CPI for computer software and accessories, and CPI for telephone hardware, calculators, and other consumer information items.
15	Sporting	Commodity-flow method,	Retail control method, using	Retail control	Same as for most	CPI for sports equipment.

Table 5.A—Summary of Methodology Used to Prepare Estimates of PCE for Goods

Line in NIPA table group 2.4	Component	Current-dollar estimates				Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates**	
	equipment, supplies, guns, and ammunition	starting with manufacturers' shipments from EC.	retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	method, using retail sales from MRTS.	recent year.	
16	Sports and recreational vehicles	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for new motorcycles and CPI for sports vehicles including bicycles.
17	Recreational books	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for recreational books.
18	Musical instruments	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for music instruments and accessories.
19	Other durable goods:					
20	Jewelry and watches	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for jewelry and CPI for watches.
21	Therapeutic appliances and equipment	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for medical equipment and supplies and CPI for eyeglasses and eye care.
22	Educational books	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for educational books and supplies.

Table 5.A—Summary of Methodology Used to Prepare Estimates of PCE for Goods

Line in NIPA table group 2.4	Component	Current-dollar estimates				Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates**	
23	Luggage and similar personal items	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for miscellaneous personal goods.
24	Telephone and related communication equipment	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on scanner data from NPD group.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for telephone hardware, calculators, and other consumer information items.
25	**Nondurable goods:**					
26	Food and beverages purchased for off-premises consumption:					
27	Food and nonalcoholic beverages purchased for off-premises consumption	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold largely based on scanner data from Information Resources, Inc. and from Fresh Look Marketing Group.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	Detailed price components of the CPI for food at home.
28	Alcoholic beverages purchased for off-premises consumption	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on scanner data from Information Resources, Inc.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for distilled spirits at home, CPI for wine at home, and CPI for beer, ale, and other malt beverages at home.
29	Food produced and consumed on farms	Data from U.S. Department of Agriculture (USDA).	Same as for benchmark year.	Same as for benchmark year.	Judgmental trend.	BEA composite index of USDA prices received by farmers.
30	Clothing and footwear:					
31	Garments:					
32	Women's and girls' clothing	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for women's and girls' apparel.

Table 5.A—Summary of Methodology Used to Prepare Estimates of PCE for Goods

Line in NIPA table group 2.4	Component	Current-dollar estimates				Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates**	
			commerce Report.			
33	Men's and boys' clothing	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for men's and boys' apparel.
34	Children's and infants' clothing	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for infants' and toddlers' apparel.
35	Other clothing materials and footwear	Standard clothing issued military: federal budget data. Other components: commodity-flow method, starting with manufacturers' shipments from EC.	Standard clothing issued military: same as for benchmark year. Other components: retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	Standard clothing issued military: same as for benchmark year. Other components: retail control method, using retail sales from MRTS.	Standard clothing issued military: judgmental trend. Other components: same as for most recent year.	Standard clothing issued military: PPI for apparel. Other components: CPI for sewing machines, fabric, and supplies and CPI for footwear.
36	Gasoline and other energy goods:					
37	Motor vehicle fuels, lubricants, and fluids [For more detail on gasoline and other motor fuel, see the technical note "Special Estimates."]	Gasoline and other motor fuel: Primarily EC receipts data on automotive fuels sold at gasoline stations. Other components: commodity-flow method, starting with manufacturers' shipments from EC.	Nondiesel gasoline: information on quantities from EIA and on prices from BLS. Diesel gasoline: information on household purchases from BLS Consumer Expenditure Survey. Other components: manufacturers' shipments from Census Bureau annual	Nondiesel gasoline: same as for nonbenchmark years. Diesel gasoline: information on quantities from EIA and on prices from BLS. Other components:	Diesel and nondiesel gasoline: same as for most recent year. Other components: same as for most recent year.	CPI for motor fuel and CPI for motor oil, coolants, and fluids.

Table 5.A—Summary of Methodology Used to Prepare Estimates of PCE for Goods

Line in NIPA table group 2.4	Component	Current-dollar estimates				Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates**	
			survey of manufactures.	motor fuel quantities from EIA times CPI for motor oil, coolants, and fluids.		
38	Fuel oil and other fuels	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for fuel oil and CPI for propane, kerosene, and firewood.
39	Other nondurable goods:					
40	Pharmaceutical and other medical products	Prescription and nonprescription drugs: EC data on product-line sales. Other components: commodity-flow method, starting with manufacturers' shipments from EC.	Prescription drugs: value of sales to consumers from IMS Health, Inc. Other components: retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	Prescription drugs: same as for nonbenchmark years. Other components: retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for prescription drugs, CPI for nonprescription drugs, and CPI for medical equipment and supplies.
41	Recreational items	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for toys, CPI for pets and pet products, CPI for indoor plants and flowers, and CPI for film and photographic supplies.
42	Household supplies	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for household cleaning products, CPI for household paper products, CPI for other linens, CPI for sewing machines, fabric, and supplies, and CPI for miscellaneous household products.

Table 5.A—Summary of Methodology Used to Prepare Estimates of PCE for Goods

Line in NIPA table group 2.4	Component	Current-dollar estimates				Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates**	
43	Personal care products	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for hair, dental, shaving, and miscellaneous personal care products and CPI for cosmetics, perfume, bath, nail preparations, and implements.
44	Tobacco products	Commodity-flow method, starting with manufacturers' shipments from EC.	Nielsen point-of-sale data for tobacco and smoking products.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	CPI for tobacco and smoking products.
45	Magazines, newspapers, and stationery	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from ARTS. Composition of goods sold partly based on Census E-commerce Report.	Retail control method, using retail sales from MRTS.	Same as for most recent year.	CPI for newspapers and magazines and CPI for stationery, stationery supplies, and gift wrap.
46	Net expenditures abroad by U.S. residents.	BEA international transactions accounts estimates (based on BEA model).	Same as for benchmark year.	Same as for benchmark year.	Same as for benchmark year.	Personal remittances in kind to nonresidents: CPI for commodities. Other components: BEA price index for installation support services.

* The description "Same as for benchmark year" indicates that the estimate is prepared using a methodology similar to that used for the benchmark estimate rather than by using an indicator series to interpolate or extrapolate the benchmark estimate.
** For the components that use MRTS for the advance quarterly estimate, the source data for the third month of the quarter are from the Census Bureau's Advance Monthly Retail Sales for Retail and Food Services because the MRTS data are not yet available. For some other components, the source data may be available for only the first 2 months of the quarter; in such cases, the estimates for the third month are based on judgmental trend.

ARTS Annual Retail Trade Survey, Census Bureau
BLS Bureau of Labor Statistics
CES Current Employment Statistics, BLS
CPI Consumer Price Index, BLS
EC Economic Census, Census Bureau
MSBO Manufacturer Sales Branches and Offices
MRTS Monthly Retail Trade Survey, Census Bureau

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
47	**Services:**				
48	Household consumption expenditures:				
49	Housing and utilities:				
50	Housing:				
51	Rental of tenant-occupied nonfarm housing [For more detail, see the technical note "Special Estimates."]	Unit stocks and average rent based on Census Bureau decennial census of housing.	Unit stocks based on Census Bureau biennial American housing survey or on Census Bureau current population survey; average rent based on CPI for rent of primary residence.	Unit stocks adjusted using Census Bureau data on housing completions; average rent same as for nonbenchmark years.	Tenant-occupied stationary and mobile homes: CPI for rent of primary residence. Tenant landlord durables: CPI for major appliances.
52	Imputed rental of owner-occupied nonfarm housing [For more detail, see the technical note "Special Estimates."]	Unit stocks based on Census Bureau decennial census of housing; average annual rent based on Census Bureau residential finance survey.	Unit stocks based on Census Bureau biennial American housing survey or on Census Bureau current population survey; average rent based on CPI for owners' equivalent rent of primary residence.	Unit stocks adjusted using Census Bureau data on housing completions; average rent same as for nonbenchmark years.	CPI for owners' equivalent rent of primary residence.
53	Rental value of farm dwellings	Gross rental value of farm dwellings from USDA.	Same as for benchmark year.	Judgmental trend.	Quantity extrapolation using real-dollar net stock of farm housing from BEA capital stock estimates. For current quarterly based on CPI for owners' equivalent rent of primary residence.
54	Group housing	Rooming and boarding houses: commodity-flow method, starting with receipts from EC. Employee lodging: QCEW employment times CPI for rent of primary residence.	Rooming and boarding houses: QCEW wage data. Employee lodging: same as for benchmark year.	Judgmental trend.	CPI for rent of primary residence.
55	Household utilities:				

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
56	Water supply and sanitation	Commodity-flow method, starting with water, sewerage, and waste collection receipts from EC and from COG.	Water supply and sewerage maintenance: for third most recent year, GF receipts adjusted from fiscal year to calendar year basis; for second most recent year, GF receipts and judgmental trend; for most recent year, judgmental trend. Garbage and trash collection: SAS receipts data.	Water supply and sewerage maintenance: same as for most recent year. Garbage and trash collection: for second and third estimate, QSS total receipts data; for advance estimate, judgmental trend.	Water supply and sewerage maintenance: CPI for water and sewerage maintenance. Garbage and trash collection: CPI for garbage and trash collection.
57	Electricity and gas:				
58	Electricity	Variation of commodity-flow method, using annual residential revenue from EIA.	Same as for benchmark year, except most recent year based on residential revenue from monthly EIA survey.	EIA data on kilowatt-hour sales to residential customers and on cents per kilowatt hour, both adjusted by BEA from a billing to a usage basis.	CPI for electricity.
59	Natural gas	Variation of commodity-flow method, using EIA annual residential unit and price data.	Same as for benchmark year.	EIA data on cubic-feet sales of gas to residential customers and on cents per cubic foot, both adjusted by BEA from a billing to a usage basis.	CPI for utility (piped) gas service.
60	Health care:				
61	Outpatient services:				
62	Physician services	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For second and third estimates, QSS receipts data; for advance estimate, judgmental trend.	PPI for offices of physicians.
63	Dental services	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For third estimate, QSS receipts data; for second and advance estimates, judgmental trend.	CPI for dental services.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
64	Paramedical services	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For second and third estimates, QSS receipts data; for advance estimates, CES data on employment, hours, and earnings.	Home health care: PPI for home health care services. Medical laboratories: PPI for medical laboratories and PPI for diagnostic imaging centers. Specialty outpatient care facilities and health and allied services, and all other professional medical services: CPI for services by other medical professionals.
65	Hospitals and nursing home services:				
66	Hospitals	Private: commodity-flow method, starting with receipts from EC. Government: commodity-flow method, starting with receipts from COG and federal agency data.	Private: SAS receipts data. Government: federal agency data and for third most recent year, GF receipts adjusted from a fiscal year basis to a calendar year basis; for second most recent year, GF receipts and judgmental trend; for most recent year, judgmental trend.	Private: for second and third estimates, QSS receipts data; for advance estimates, CES employment, hours, and earnings. Government: same as for most recent year.	PPI for hospitals.
67	Nursing homes	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For second and third estimates, QSS receipts data; for advance estimate, CES employment, hours, and earnings.	PPI for nursing care facilities.
68	Transportation services:				
69	Motor vehicle services:				
70	Motor vehicle maintenance and repair	Commodity-flow method, starting with receipts from EC.	SAS, National Automobile Dealers Assn. (NADA), and ARTS receipts data, except most	For third estimate, QSS receipts data; for second and advance estimates, judgmental	CPI for motor vehicle maintenance and repair.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
			recent year based on SAS, NADA, and MRTS receipts data.	trend.	
71	Other motor vehicle services	Motor vehicle leasing: BLS consumer expenditures survey data. Motor vehicle rental: Commodity-flow method, starting with receipts from EC. Parking fees: Commodity-flow method starting with EC. Tolls: Commodity-flow method starting with COG.	Motor vehicle leasing: same as for benchmark year, except most recent year based on personal lease registrations from R.L. Polk & Co. and on BEA estimate of average expenditures. Motor vehicle rental: SAS receipts data. Parking fees: SAS receipts data. Tolls: For third most recent year, GF receipts adjusted from a fiscal year basis to a calendar year basis; for second most recent year, GF receipts and judgmental trend; for most recent year, judgmental trend.	Motor vehicle leasing: same as for most recent year. Motor vehicle rental: for third estimate, QSS receipts data; for second and advance estimates, judgmental trend. Parking fees and tolls: judgmental trend.	Motor vehicle leasing: CPI for leased cars and trucks. Motor vehicle rental: CPI for car and truck rental. Parking fees and tolls: CPI for parking fees and tolls.
72	Public transportation:				
73	Ground transportation:				
	Railway	Commodity-flow method, starting with passenger revenue from Amtrak annual report, S&L government data on Alaska Railroad, and Class 1 railroad passenger data from the Surface Transportation Board.	Passenger revenue from Amtrak monthly reports.	Same as for nonbenchmark years.	CPI for other intercity transportation.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
	Intracity mass transit	Commodity-flow method, starting with receipts from American Public Transportation Association (APTA).	Data on receipts from APTA and from SAS, except most recent year based on number of passenger trips from APTA times CPI for intracity mass transit and on SAS receipts data.	For second and third estimates, APTA trips data times CPI for intracity mass transit and QSS receipts data; for advance estimate, APTA trips data times CPI for intracity mass transit.	CPI for intracity transportation.
	Taxicabs and ride sharing services	Variation of commodity-flow method, based primarily on BLS consumer expenditures survey data on taxi fares and limo services receipts.	Information on household purchases from BLS Consumer Expenditure Survey; for most recent year, judgmental trend.	For third estimate, QSS receipts data; for second and advance estimates, judgmental trend.	CPI for intracity transportation.
	Intercity bus	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For third estimate, QSS receipts data; for second and advance estimates, passenger revenue data from Greyhound.	CPI for other intercity transportation.
	Other road transportation	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For third estimate, QSS receipts data; for second and advance estimates, judgmental trend.	CPI for other intercity transportation.
74	Air transportation	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For second and third estimates, QSS receipts data; for advance estimates, Transportation Security Administration Traveler Throughput data.	PPI for domestic scheduled passenger air transportation.
75	Water transportation	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For third estimate, QSS receipts data; for second and advance estimates, judgmental trend.	CPI for other intercity transportation.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
76	Recreation services:				
77	Membership clubs, sports centers, parks, theaters, and museums	High school sports: commodity-flow method, starting with sales data from Census Bureau census of governments. College sports: commodity-flow method, starting with National Collegiate Athletic Assn. (NCAA) sales data. Other components: commodity-flow method, starting with receipts from EC.	High school sports: for third most recent year, GF receipts adjusted from a fiscal year basis to a calendar year basis; for second most recent year, GF receipts and judgmental trend; for most recent year, judgmental trend. College sports: NCAA admissions times CPI for admission to sporting events. Other components: SAS receipts data.	Membership clubs and participant sports centers: for third estimate, QSS receipts data; for second and advance estimates, CES employment, hours, and earnings. Amusement parks, campgrounds, and related recreational services: for third estimate, QSS receipts data; for second and advance estimates, judgmental trend. Motion picture admissions: box office receipts from Boxofficemojo.*com*. Spectator sports: for third estimate, QSS receipts data; for second and advance estimates, judgmental trend. Live entertainment other than sports: for third estimate, QSS receipts data; for second and advance estimates, judgmental trend. Museums and libraries: CES employment, hours, and earnings.	Membership clubs and participant sports centers: CPI for club dues and fees for participant sports and group exercises; Amusement parks, campgrounds, and related recreational services: CPI for other recreation services; Spectator sports: CPI for admission to sporting events; Motion picture theaters, live entertainment, excluding sports, and museums and libraries: CPI for admission to movies, theaters, and concerts.
78	Audio-video, photographic, and information	Commodity-flow method, starting with receipts from EC.	Video streaming and rental: SAS receipts data and company revenue reports.	Cable, satellite, and other live television services: for second and third estimates, QSS	Cable, satellite, and other live television services: CPI for cable and satellite television service;

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
	processing equipment services		Audio streaming and radio services: Recording Industry Association of America industry data on paid subscription streaming and company revenue reports. Other components: SAS receipts data.	residential receipts data and HarrisX data on live streaming revenues; for advance estimate, judgmental trend and HarrisX data on live streaming revenues. Video streaming and rental: HarrisX data on on-demand streaming and video rental revenues; Repair and rental of audio-visual, photographic, and information processing equipment: for third estimate, QSS receipts data; for second and advance estimates, judgmental trend. Other components: judgmental trend.	Repair and rental of audio-visual, photographic, and information processing equipment: CPI for video and audio; Photo processing: CPI for film processing; Photo studios: CPI for photographer fees; Video streaming and rental: CPI for rental of video discs and other media. Audio streaming and radio services: CPI for recorded music and music subscriptions.
79	Gambling	Casino gambling: commodity-flow method, starting with receipts from EC. Lotteries: commodity-flow method, starting with receipts from COG. Pari-mutuel net receipts: commodity-flow method, starting with receipts from EC.	Casino gambling: receipts data from SAS, ARTS, and National Indian Gaming Commission, except most recent year based on SAS receipts data. Lotteries: for third most recent year, GF receipts adjusted from a fiscal year basis to a calendar year basis; for second most recent year, GF receipts and judgmental trend; for most recent year, judgmental trend.	Casino gambling: for third estimate, QSS receipts data and revenue data from state gaming control commissions; for second and advance estimates, revenue data from state gaming control commissions. Lotteries: same as for most recent year. Pari-mutuel net receipts: for third estimate, QSS receipts	CPI for all items.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
			Pari-mutuel net receipts: SAS receipts data.	data; for second and advance estimates, judgmental trend.	
80	Other recreational services:				
	Veterinary and other services for pets	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	CES employment, hours, and earnings.	CPI for pet services including veterinary.
	All other recreation services	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	Package tours: for third estimate, QSS receipts data; for second and advance estimates, judgmental trend. Other components: judgmental trend.	Package tours: CPI for other recreation services. Maintenance and repair of recreational and sports equipment: CPI for sporting goods.
81	Food services and accommodations:				
82	Food services:				
83	Purchased meals and beverages	Meals at schools: receipts from COG. Other components: receipts from EC and from COG.	Meals at schools: for third most recent year, GF receipts adjusted from a fiscal year basis to a calendar year basis; for second most recent year, GF receipts and judgmental trend; for most recent year, judgmental trend. Other components: sales by food services and drinking places from ARTS; for most recent year, from MRTS instead of ARTS.	Meals at schools: same as most recent year. Other components: same as for most recent year.	Meals at schools: CPI for food at employee sites and schools. Meals at limited service eating places: CPI for limited service meals and snacks. Meals at other eating places, and Meals at drinking places: CPI for full service meals and snacks. Alcohol in purchased meals: CPI for alcoholic beverages away from home.
84	Food furnished to employees (including military)	Civilian employees: number of employees in certain industries from CES times judgmental estimate of average	Civilian employees: number of employees in certain industries from CES times CPI for food at employee sites and schools.	Civilian employees: same as for most recent year. Military employees: number of active duty personnel based on	CPI for food at employee sites and schools.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
		consumption. Military employees: expenditures from federal budget data.	Military employees: same as for benchmark year.	Federal employment data times CPI for food at employee sites and schools.	
85	Accommodations	Hotels and motels: commodity-flow method, starting with EC data on guest room rentals and using American Hotel and Lodging Assn. (AHLA) data for consumer share of lodging expenditures and using ITA data on travel exports. Housing at schools: commodity-flow method, using National Center of Education Statistics (NCES) data on enrollment, average room rates, and portion of students living in student housing.	Hotels and motels: ARTS, AHLA, and ITA data, except most recent year based on hotel and motel room revenue data from Smith Travel Research instead of AHLA data. Housing at schools: NCES data on enrollment and on average room rates.	Hotels and motels: hotel and motel room revenue data from Smith Travel Research. Housing at schools: judgmental trend.	Hotels and motels: CPI for other lodging away from home including hotels and motels. Housing at schools: CPI for housing at school, excluding board.
86	Financial services and insurance:				
87	Financial services:				
88	Financial services furnished without payment [For more detail, see the technical note "Special Estimates."]	Commodity-flow method, primarily based on data from federal government administrative agencies.	Pension plans: same as for benchmark year, except most recent year based on QCEW. Other components: same as for benchmark year.	Commercial banks and Other depository institutions: for third estimate, data from federal government administrative agencies; for second and advance estimates, judgmental trend. Regulated investment companies: Investment Company Institute data on mutual fund assets.	Commercial banks: for annual, quantity extrapolation, using BLS banking output indexes; for quarterly, judgmental trend. Other depository institutions: PCE deflator for services furnished without payment by commercial banks. Other components: BEA composite indexes of input costs.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
				Pension plans: judgmental trend.	
89	Financial service charges, fees, and commissions:				
	Financial service charges and fees [For more detail, see the technical note "Special Estimates."]	Commodity-flow method, based on data from EC, from other federal government sources, and from private sources.	Based on data from Federal Deposit Insurance Corporation (FDIC), from other federal government sources, and from private sources.	For third estimate, primarily FDIC data and judgmental trend; for second and advance estimates, judgmental trend.	CPI for checking account and other bank services.
	Securities commissions [For more detail, see the technical note "Special Estimates."]	Commodity-flow method, primarily based on data from EC, federal government administrative agencies, and stock exchanges.	Primarily based on Financial and Operational Combined Uniform Single Reports data, other federal government administrative agency data, and stock exchange data.	For third estimate, same as for nonbenchmark years; for second and advance estimates, stock exchange data and Investment Company Institute (ICI) data.	Direct commissions on exchange-listed equities: PPI for brokerage services, equities and ETFs. Other direct commissions: PPI for brokerage services, all other securities. Imputed commissions on over-the-counter equity securities: PPI for dealer transactions, equity securities. Other imputed commissions: PPI for dealer transactions, debt securities and all other trading. Commissions on mutual fund sales: quantity extrapolation using mutual fund sales from ICI deflated by CPI for all items.
	Portfolio management and investment advice services	Commodity-flow method, primarily based on data from EC.	SAS receipts data.	For third estimate, QSS receipts data; for second and advance estimates, CES data on employment, hours, and	Fixed-weighted average of PPI for Portfolio management and PPI for investment advice.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
				earnings.	
	Trust, fiduciary, and custody activities	Commodity-flow method, primarily based on data from EC and from the Federal Financial Institution Examination Council.	FDIC data.	For third estimate, same as for nonbenchmark years; for second and advance estimates, judgmental trend.	PPI for Commercial bank trust services
90	Insurance:				
91	Life insurance [For more detail, see the technical note "Special Estimates."]	Primarily based on data on operating expenses from A.M. Best Co.	Same as for benchmark year, except most recent year based on QCEW wage data.	CES data on earnings.	BEA composite index of input costs.
92	Net household insurance [For more detail, see "Property and casualty insurance" in the technical note.]	Based on A.M. Best Co. data on premiums and losses.	Same as for benchmark year.	Judgmental trend.	PPI for homeowners' insurance.
93	Net health insurance [For more detail on workers' compensation, see "Property and casualty insurance" in the technical note.]	Medical care and hospitalization: premiums from National Center for Health Statistics (NCHS); benefits from EC. Workers' compensation: commodity-flow method, based on A.M. Best Co. data on premiums and losses.	Medical care and hospitalization: premiums from NCHS and A.M. Best Co. except judgmental trend for most recent year; benefits based on a ratio using A.M. Best data on benefits and premiums except for judgmental trend for most recent year. Workers' compensation: same as for benchmark year.	Judgmental trend.	Medical care and hospitalization: PPI for direct health and medical insurance carriers. Workers' compensation: PPI for workers' compensation insurance. Income loss: CPI for all items.
94	Net motor vehicle and other	Based on A.M. Best Co. data on premiums and losses.	Same as for benchmark year.	Judgmental trend.	PPI for private passenger auto insurance.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
	transportation insurance [For more detail, see "Property and casualty insurance" in the technical note.]				
95	Other services:				
96	Communication:				
97	Telecommunication services	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	Cellular telephone: for second and third estimates, QSS total receipts data; for advance estimate, judgmental trend. Other components: for second and third estimates, QSS residential receipts data; for advance estimate judgmental trend.	Cellular telephone: Fixed-weighted average of CPI for wireless telephone services and CPI for smartphones. Land-line, telephone services, local charges and long-distance charges: CPI for land line telephone services.
98	Postal and delivery services	Commodity-flow method, starting with revenues from U.S. Postal Service (USPS) and receipts from EC.	USPS and SAS receipts data.	For second and third estimates, USPS receipts data and QSS receipts data; for advance estimate, judgmental trend.	First-class postal service (by U.S. Postal Service): CPI for postage. Other delivery services (by non-U.S. postal facilities): CPI for delivery services.
99	Internet access	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For second and third estimates, QSS receipts data; for advance estimate, judgmental trend.	CPI for internet services and electronic information providers.
100	Education services:				
101	Higher education	Private: commodity-flow method, starting with receipts data from NCES.	Private: same as for benchmark year, except judgmental trend for 2 most recent years.	Nonprofit: CES employment times CPI for college tuition and fees.	CPI for college tuition and fees.

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
		Public: commodity-flow method, starting with tuition receipts from COG.	Public: for third most recent year, GF tuition receipts adjusted from a fiscal year basis to a calendar year basis; for second most recent year, GF receipts and judgmental trend; for most recent year, judgmental trend.	Public and proprietary: judgmental trend.	
102	Nursery, elementary, and secondary schools	Elementary and secondary: commodity-flow method, starting with estimated receipts based on expenses from NCES and tuition-to-expenses ratios from National Catholic Education Assn. data. Nursery: commodity-flow method, starting with receipts from EC.	Elementary and secondary: Expenses from NCES. Nursery: SAS receipts data.	Elementary and secondary: CES employment times CPI for elementary and high school tuition and fees. Nursery: For third estimate, QSS receipts data; for second and advance estimates, CES employment times CPI for child care and nursery school.	Elementary and secondary: CPI for elementary and high school tuition and fees. Nursery: CPI for child care and nursery school.
103	Commercial and vocational schools	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For third estimate, QSS receipts data; for second and advance estimates, CES employment times CPI for technical and business school tuition and fees.	CPI for technical and business school tuition and fees.
104	Professional and other services:				
	Legal services	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For second and third estimates, QSS receipts data; for advance estimate, judgmental trend.	CPI for legal services.
	Accounting and other business services	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	Judgmental trend.	Tax preparation and other related services: CPI for tax return preparation and other accounting

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
					fees. Employment agency services: PPI for employment placement agencies—primary services. Other personal business services: CPI for miscellaneous personal services.
	Labor organization dues	Commodity-flow method, based on wages from QCEW and on IRS ratio of membership dues to wage expenses for labor, agricultural, and horticultural organizations.	QCEW wage data.	Based on CES employment, hours, and earnings.	BEA composite index of input costs.
	Professional association dues	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For third estimate, QSS receipts data; for second and advance estimates, based on CES employment, hours, and earnings.	CPI for legal services.
	Funeral and burial services	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	For second and third estimates, QSS receipts data; for advance estimate, judgmental trend.	CPI for funeral expenses.
105	Personal care and clothing services	Commodity-flow method, starting with receipts from EC.	SAS receipts data.	Repair and hire of footwear: judgmental trend. Other components: for second and third estimates, QSS receipts data; for advance estimate, judgmental trend.	Hairdressing salons and personal grooming establishments: CPI for haircuts and other personal care services. Miscellaneous personal care services; clothing repair, rental and alterations; and, repair and hire of footwear: CPI for apparel services other than laundry and dry

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
					cleaning. Laundry and dry cleaning services: CPI for laundry and dry cleaning services.
106	Social services and religious activities	Religious organizations: commodity-flow method, starting with receipts based on Independent Sector study of church finances. Other private social service activities: commodity-flow method, starting with receipts from EC. Public social service activities: government sales from COG.	Religious organizations: data on change in charitable giving to religious organizations from Giving USA publication, except most recent year based on QCEW wage data. Other private social service activities: SAS receipts data. Public social service activities: for third most recent year, GF receipts adjusted from a fiscal year basis to a calendar year basis; for second most recent year, GF receipts and judgmental trend; for most recent year, judgmental trend.	Community food and housing/emergency/other relief services: for second and third estimates, QSS receipts data; for advance estimate, based on CES employment, hours, and earnings. Religious organizations: judgmental trend. Foundations: for third estimate, QSS receipts data; for second and advance estimates, judgmental trend. Other social service activities: for third estimate, QSS receipts data; for second and advance estimates, based on CES employment, hours, and earnings.	Child care: CPI for child care and nursery school. Other components: BEA composite index of input costs.
107	Household maintenance	Domestic services: receipts of residential cleaning services from EC and earnings of private household workers from Census Bureau current population survey (CPS). Other components: commodity-flow method, starting with	Domestic services: receipts of residential cleaning services from SAS and earnings of private household workers from CPS. Other components: SAS receipts data.	Domestic services and other household services: judgmental trend. Moving, storage, and freight services: for second and third estimates, QSS receipts data; for advance estimate, judgmental trend.	Domestic services: CPI for domestic services, CPI for food at home, and CPI for laundry and dry cleaning services. Moving, storage, and freight services: CPI for moving, storage, freight expense. Repair of furniture, furnishings, and

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
		receipts from EC.		Other components: for third estimate, QSS receipts data; for second and advance estimates, judgmental trend.	floor coverage; and repair of household appliances: CPI for repair of household items. Other household services: CPI for household operations.
108	Net foreign travel:				
109	Foreign travel by U.S. residents	Travel expenditures and passenger fares paid to foreign air and ocean carriers: ITA data on travel and passenger fare imports. Consumer share based on International Trade Administration in-flight survey data. Passenger fare payments to U.S. air carriers: international air passenger revenue from EC, less data on air passenger fare exports. Consumer share based on International Trade Administration in-flight survey data.	Travel expenditures and passenger fares paid to foreign air and ocean carriers: Same as for benchmark year. Passenger fare payments to U.S. air carriers: international air passenger revenue from SAS, less data on air passenger fare exports.	Travel expenditures and passenger fares paid to foreign air and ocean carriers: for third and second estimates, same as for benchmark year; for advance estimate, same except using monthly U.S. international trade in goods and services. Passenger fare payments to U.S. air carriers: for second and third estimates, QSS receipts data, less ITA data on air passenger fare exports and BTS airline traffic data for international share in third estimate; for advance estimate, same except using monthly U.S. international trade in goods and services.	Travel expenditures: BEA composite index of foreign CPIs (exchange-rate adjusted). Passenger fare imports: BLS import price index for air passenger fares. Passenger fare payments to U.S. carriers: PPI for international scheduled passenger air transportation.
110	Less: Expenditures in the United States by nonresidents	ITA data on exports.	Same as for benchmark year.	For third and second estimates, same as for benchmark year; for advance estimate, monthly U.S. international trade in goods	Foreign travel in the United States: BEA composite price index from a number of CPI and PPI component indexes. Medical expenditures of foreigners:

Table 5.B—Summary of Methodology Used to Prepare Estimates of PCE for Services

Line in NIPA table group 2.4	Component	Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	
				and services.	CPI for hospital and related services. Expenditures of foreign students in the United States: CPI for college tuition and fees.
111	Final consumption expenditures of nonprofit institutions serving households	Calculated as line 112 minus line 113.			
112	Gross output of nonprofit institutions [For more detail, see technical note "Special Estimates."]	See the technical note and the relevant detailed categories above.			BEA indexes of input costs.
113	Less: Receipts from sales of goods and services by nonprofit institutions [For more detail, see technical note "Special Estimates."]	See the technical note and the relevant detailed categories above.			See relevant detailed categories above.

* The description "Same as for benchmark" indicates that the estimates are prepared using a methodology similar to that used for the benchmark estimates rather than by using an indicator series to interpolate or extrapolate the benchmark or annual estimates.

ARTS Annual Retail Trade Survey, Census Bureau
BEA Bureau of Economic Analysis
BLS Bureau of Labor Statistics
BTS Bureau of Transportation Statistics
CES Current Employment Statistics, BLS
COG Census of Governments, Census Bureau
CPI Consumer Price Index, BLS
EC Economic Census, Census Bureau
EIA Energy Information Administration
GF Annual Survey of Government Finances, Census Bureau
IRS Internal Revenue Service
ITA International Transactions Accounts, BEA
MRTS Monthly Retail Trade Survey, Census Bureau
PPI Producer Price Index, BLS

QCEW	Quarterly Census of Employment and Wages, BLS
QSS	Quarterly Services Survey, Census Bureau
SAS	Service Annual Survey, Census Bureau
USDA	U.S. Department of Agriculture

Technical Note: Special Estimates

This technical note provides detailed descriptions of the sources and methods used to estimate the following key components of personal consumption expenditures (PCE): new motor vehicles; net purchases of used motor vehicles; motor vehicle fuels; rental of tenant- and owner-occupied nonfarm housing; financial service charges and fees; securities commissions; financial services furnished without payment; life insurance; property and casualty insurance (household insurance, workers' compensation, and motor vehicle insurance); and nonprofit institutions serving households.

New motor vehicles

The annual and quarterly estimates of PCE for new motor vehicles are derived by summing monthly estimates that are prepared separately for domestic autos, for foreign autos, for domestic light trucks, and for foreign light trucks.[14] The monthly estimates of the value of motor vehicle sales are derived as the number of units sold times the average expenditure per transaction, and the shares of these sales that are accounted for by persons are derived using information on new motor vehicle registrations.

The data on monthly unit sales of autos and of light trucks (including vans and sport utility vehicles) are obtained from *Wards' Automotive Reports*. The share of these sales that are accounted for by persons is derived from monthly data on new registrations by persons, government, and business from R.L. Polk & Co. For autos, the business portion of "mixed-use" autos—that is, autos used both for business and personal use—is removed from sales to persons; this adjustment, which was initially based on data on business mileage driven by household members from a since-discontinued Census Bureau Current Population Survey (CPS) report, "Current Buying Indicators," is updated annually to reflect changes in the ratio of self-employed persons to households based on CPS data.[15] For trucks, the share of sales to persons is benchmarked to information on the personal share of new truck purchases from the Vehicle Inventory and Use Survey in the Census Bureau's Economic Census. For foreign autos, the share of sales to persons is equal to total unit sales less unit sales to business and government, which is estimated annually using data on business and total registrations. For domestic autos, sales to

[14] In the NIPA estimates of PCE, sales of domestic motor vehicles consist of units assembled in the United States, Canada, and Mexico; sales of foreign motor vehicles are those assembled elsewhere. (In contrast, in the addenda to NIPA table 7.2, "Motor Vehicle Output," "domestic output of new autos" refers only to autos assembled in the United States, and "sales of imported autos" refers to autos assembled outside the United States.)

[15] According to the international *System of National Accounts*, "when the owner of a business uses a vehicle partly for business purposes and partly for personal benefit, the expenditure on the purchase of the vehicle should be split between gross capital formation and household final consumption expenditures in proportion to its use for business and personal purposes." See Commission of the European Communities, International Monetary Fund, Organisation for Economic Cooperation and Development, United Nations, and the World Bank, *System of National Accounts 2008*.

persons is equal to total unit sales to persons less foreign unit sales to persons.

The estimates of average expenditure per transaction are derived from data on monthly retail transactions prices by make, model, and trim level from J.D. Power and Associates.[16] Overall average expenditures are obtained using these detailed average transactions prices and the data on unit sales by model.

For the current quarterly and monthly estimates, the business portion of "mixed-use" autos and the business portion of foreign car sales are held constant at the percentages for the most recent year, and the business portions of domestic autos and of light trucks are based on the monthly registrations data. For the advance quarterly estimate, 3 months of unit sales and price data and 2 months of registrations data are available; the business portions for the third month of the quarter are estimated by applying the previous month's personal registration percentages by make to the third month's sales by make.

The estimates of real PCE for new motor vehicles are prepared by deflation. For autos, the CPI for new cars is used as the deflator; for trucks, the CPI for new trucks is used.

[16] The make is the brand name of the vehicle (such as BMW or Chevrolet). The model is the classification of the vehicle as a particular variety within the same make (such as BMW 3-Series or Chevrolet Malibu). The trim level is the classification of the vehicle as a particular type within the same model (such as BMW 328i or Malibu 1LT).

Net purchases of used motor vehicles

In PCE, net purchases of used motor vehicles consist of *dealers' margins* on purchases of these vehicles by persons and of *net transactions* between persons and other sectors of the economy. Net transactions for the personal sector are positive, because persons buy more vehicles from the other sectors than they sell to those sectors; in contrast, net transactions for business are negative.[17] In calculating GDP, the intersectoral net transactions offset, leaving the margins on the transactions as value added. Separate estimates are made for used autos and for used light trucks.

Dealers' margins

All purchases of used vehicles by persons from dealers include the retail margin—the difference between the selling price and the dealer's cost of acquisition. Additionally, they may include a wholesale margin (for vehicles sold to dealers by wholesalers) and sales taxes that are collected by dealers on behalf of government.

For benchmark years, total margins are estimated by applying margin rates and sales-tax rates to retail and wholesale sales of used motor vehicles. Then, the proportion of this total that applies to sales to persons is determined.[18] Retail and wholesale margin rates are estimated using data from the Census Bureau's Annual Retail Trade Survey (ARTS) and Annual Wholesale Trade Survey (AWTS). Wholesale and retail sales of used motor vehicles are based on product-line sales data from the Census Bureau's Economic Census. Sales taxes are calculated using data from the Census Bureau's Census of Governments, from individual states on tax collections, from ARTS, and from AWTS. For autos, almost all the margin is allocated to sales to persons; for light trucks, the allocation to persons is based on information from the Census Bureau's Vehicle Inventory and Use Survey.

For nonbenchmark years, retail and wholesale margins are extrapolated using Census Bureau's gross margins for used car dealers and wholesale margins excluding Manufacturers' Sales Branches and Offices (MSBOs) for motor vehicle and motor vehicle parts and supplies, respectively. Once retail and wholesale margins are estimated, both used margin components are summed to derive a total used margin of motor vehicles. For the most recent year, total retail and wholesale margins are extrapolated using Census Bureau's retail sales of used car dealers and wholesale sales except MSBOs for motor vehicle and motor vehicle parts and supplies, respectively. The total used margin is then allocated to used autos and to used light trucks based on changes in used vehicle unit registrations from R.L. Polk & Co. and on average prices of used

[17] These values plus the associated margins are shown as "net purchases of used autos and used light trucks" in lines 9 and 18 in NIPA table 7.2.5B.

[18] For a general discussion of the estimation of wholesale and retail margins and taxes, see U.S. Bureau of Economic Analysis, *Concepts and Methods of the U.S. I-O Accounts*, 8: 6–14;available on BEA's website at www.bea.gov."

vehicles sold at wholesale auctions from the Auto Dealers Exchange Service of America (ADESA).

The current quarterly and monthly estimates of margins on used autos and used light trucks are extrapolated from the annual estimates using data on retail sales of used car dealers from the monthly retail trade survey. The estimates of real margins are prepared by deflation, using the PPI for used vehicle sales at new car dealers.

Net transactions

Net transactions between persons and other sectors of the economy primarily consist of the wholesale value of purchases by persons from dealers less sales by persons to dealers (either directly or as trade-ins).[19] In addition, transactions may occur between persons and businesses other than dealers (such as the sale of scrapped vehicles), government, and nonresidents. Transactions among persons are intra-sectoral and so do not affect PCE.

For benchmark years, purchases of used motor vehicles by persons from dealers is estimated as (1) dealer sales less (2) exports less (3) dealers' margins, (4) split into purchases by persons and by business. Dealer sales are from the Economic Census merchandise line data, adjusted to include sales taxes using data from the ARTS; exports are from Census' Foreign Trade Statistics and BEA's Balance of Payments Division; dealers' margins is from the ARTS; and the split is based on information from 2012 Economic Census of Retail Trade Class of Customer data and BEA's Government Expenditure data.

Sales of used motor vehicles by persons to dealers is estimated as (1) dealer sales less (2) dealers' margin plus (3) the change in dealers' inventories of used motor vehicles, (4) split into sales by persons and by business. The change in dealer inventories is based on inventory data from the ARTS; the split between sales by persons and by business is based on data from 2012 Economic Census of Retail Trade Class of Customer data and BEA's Government Expenditure data.

For nonbenchmark years, estimates of net transactions are developed by valuing the annual change in unit stocks of used motor vehicles held by persons, rather than by explicitly taking into account each type of transaction listed above. Yearend unit stocks of used autos and of used light trucks are estimated for each year of original sale (vehicles greater than 11 years old are grouped together) using annual data on new motor vehicle purchases and retention information developed from R.L. Polk & Co. data on vehicles in use by model year.[20] Unit stocks held by business are based on

[19] For autos, net purchases also includes reimbursement of government employees for use of personal autos on government business.

[20] The year of original sale is the year in which the vehicle was sold as new. Thus, for example, the stock of

business purchases of new motor vehicles and on retention rates for rental vehicles (6–18 months), leased vehicles (2–4 years), and other business vehicles (1–9 years). Unit stocks held by government are based on government purchases of new vehicles and on assumed retention rates. Stocks held by persons are then calculated as the residual.

Changes in the unit stocks of autos and of light trucks held by persons reflect purchases of new vehicles, scrappage of old vehicles, and net unit transactions other than scrappage. Purchases of new autos and of light trucks by persons are estimated separately (see the section "New motor vehicles"). Scrapped units are calculated by age of vehicle as a proportion of total vehicle scrappage; this proportion is assumed to be equal to the ratio of the unit stock held by persons to the total unit stock. Net unit transactions other than scrappage is then calculated as the residual.

The changes in unit stocks, grouped by age, are then valued at wholesale prices. The average wholesale value for each age group of used autos and of used light trucks is based on average used auto and used light truck prices by model year from National Automobile Dealers Association (NADA). Scrapped units by age are valued at 8 percent of the wholesale price.

Current quarterly and monthly estimates of net transactions are extrapolated from the annual estimates, using data on retail sales of used car dealers from the monthly retail trade survey. The estimates of real net transactions are prepared by deflation, using the CPI for used autos and trucks.

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used autos at yearend 2007 consists of all new autos that were sold in 2007, all new autos that were sold in 2006 and were not subsequently scrapped or otherwise disposed, and so on.

Gasoline and other motor fuel

The estimates of PCE for gasoline and other motor fuel are derived as the product of the quantity purchased for personal use and the average retail price per gallon. The estimates cover the personal use of motor fuel for all vehicles owned, leased, and rented by households.

Benchmark-year estimates. The benchmark estimates rely on the U.S. Census Bureau's Economic Census product-line data on receipts for automotive fuels sold at gasoline stations. The product line for automotive fuels is comprised of:

- Unleaded regular gasoline
- Unleaded mid-grade gasoline
- Unleaded premium gasoline
- Diesel fuel
- Other automotive fuels

The product line for diesel fuel is used to estimate total diesel gasoline consumption; the portion of this consumption that is accounted for by households is based on judgmental analysis of various source data. The remaining product lines for automotive fuels are used to estimate total non-diesel gasoline and other motor fuel consumption. The portion of this consumption that is accounted for by households is based primarily on the Census Bureau's Class of Customer data from the 2012 Economic Census. Aviation gasoline or air fuel is also included in this estimate; fuel purchased for airplanes is calculated as total gallons of gasoline consumed for aviation (which excludes jet fuel) from the Federal Highway Administration (FHWA) times a consumer share based on Federal Aviation Administration data on the proportion of hours flown in general aviation use that is accounted for by personal use.

Nonbenchmark-year estimates. Nonbenchmark-year estimates of PCE for gasoline and other motor fuel are prepared by separately extrapolating PCE for non-diesel gasoline and PCE for diesel gasoline from the preceding annual estimate and then summing the two estimates. PCE for non-diesel gasoline is based on data on the quantity of gasoline supplied from the Energy Information Administration (EIA) and on average prices of gasoline by grade from the Bureau of Labor Statistics (BLS). PCE for diesel gasoline is based on the BLS Consumer Expenditure Survey data on household purchases of diesel fuel, when available. Because the Consumer Expenditure Survey lags by 1 year, the estimate for the most recent year is based on EIA quantity supply of gasoline data and the BLS average price data for diesel fuel.

Current-quarterly estimates. For the current quarterly estimates, the third estimate is prepared using the same methodology as that used for the most-recent-year estimates. For the second quarterly estimate, EIA data on monthly quantities by grade are available for the first 2 months of the quarter, and weekly EIA data for total gasoline supplied is used for the third month. For the advance quarterly estimate, monthly quantities by grade are available for the first month, and weekly EIA data on total gasoline supplied are used for the third month.

Quantity estimates. The estimates of real PCE for gasoline and other motor fuel are prepared by deflation using the CPI for motor fuel.

Rental of tenant- and owner-occupied nonfarm housing

As noted in "Chapter 2: Fundamental Concepts," purchases of newly constructed housing are treated as private fixed investment rather than as consumption expenditures in the NIPAs, and the stock of housing is treated as fixed assets. The housing stock provides a flow of housing services that are consumed by persons who rent their housing and by persons who own the housing they occupy (referred to as "owner-occupants"). In the NIPAs, owner-occupants are treated as owning unincorporated enterprises that provide housing services to themselves in the form of the rental value of their dwellings.[21] Thus, PCE for housing services includes both the monetary rents paid by tenants and an imputed rental value for owner-occupied dwellings (measured as the income the homeowner could have received if the house had been rented to a tenant).[22] This treatment is designed to make PCE (and GDP) invariant to whether the house is rented by a landlord to a tenant or is lived in by the homeowner.[23]

PCE for rental of tenant-occupied dwellings is based on the rent paid by tenants—which may include charges for major appliances and furnishings, utilities, or services. The rent paid is then adjusted to exclude any utility payments and to include tenant expenditures for major replacements, maintenance, and repairs that are not reimbursed by the landlord owner. Payments for utilities are subtracted because they are already accounted for elsewhere in PCE, and tenants' unreimbursed expenditures are added because they are considered part of the rental cost to the tenant. The rental value of owner-occupied dwellings is based on that of equivalent tenant-occupied dwellings, but it consists of the rental value of the dwelling alone.

Separate estimates are prepared for owner-occupied permanent-site dwellings, owner-occupied mobile homes, tenant-occupied permanent-site dwellings, and tenant-occupied mobile homes. For each type of dwelling, rent equals the number of occupied units times the rent per unit.

Number of housing units

The benchmark estimates of units for each type of dwelling are based on data from the Census Bureau's decennial Census of Housing (COH).[24] For tenant- and owner- occupied permanent-site homes, the number of units from the COH is adjusted by BEA to reflect the stock at midyear and to account for certain vacant units, such as

[21] This treatment is consistent with that of the international *System of International Accounts* (SNA): "Households that own the dwellings they occupy are formally treated as owners of unincorporated enterprises that produce housing services consumed by those same households" (SNA 2008: 6.117).
[22] The income earned from the rental of housing, including the provision of owner-occupied housing services, is reflected in the NIPA measure of rental income of persons. For more information on this measure, see chapter 12 of this handbook.
[23] According to the SNA, "The ratio of owner-occupied to rented dwellings can vary significantly…so both international and inter-temporal comparisons of the production and consumption of housing services could be distorted if no imputation were made for the value of own-account housing services." (SNA 2008: 6.34).
[24] Thus, in the comprehensive update of the NIPAs, the benchmark estimates for PCE for housing services are made for the years ending in "0," and the estimates for other years are nonbenchmark annual estimates.

vacation homes.

For *permanent-site (or stationary) homes*, nonbenchmark annual estimates are interpolated and extrapolated from the benchmark estimates. For years for which data from the Census Bureau's biennial American Housing Survey (AHS) are available, unit stocks from the AHS are used as the indicator series; for other years, data from the Census Bureau's Current Population Survey are used to interpolate and extrapolate the AHS-based estimates. For *mobile (or manufactured) homes*, the indicator series is based on changes in unit stocks that are derived from data on shipments of manufactured homes in the Census Bureau's Monthly Construction Statistics, using a perpetual inventory calculation (see "Chapter 4: Estimating Methods").

Rent per unit

For *tenant-occupied permanent-site dwellings*, the benchmark estimates of rent per unit are based on COH data on units by rent class. The charges for utilities—energy (electricity, gas, and fuel oil and other fuels) and water and sewerage maintenance—that must be subtracted from rent are estimated as follows:

- The PCE estimates for each type of energy are allocated between tenant-occupied housing and owner-occupied housing using data from the Department of Energy's Residential Energy Consumption Survey (RECS), and the portion of the tenant expenditures for energy that is included in rent is derived using AHS data. In the cases where the RECS or AHS are not conducted in the benchmark year, proportions derived from surveys in nearby years are interpolated for the benchmark estimates.
- PCE for water and sewerage maintenance is allocated between tenant-occupied housing and owner-occupied based on the tenant-occupied share of total nonfarm permanent-site units, and the portion of the tenant expenditures that is included in rent is derived using AHS data.

The nonbenchmark annual estimates of rent per unit less utilities are derived from data on average rental value that includes expenditures for utilities whether they are paid separately or included in rent, so these data must be adjusted to exclude average utility payments. The average rental value is benchmarked using COH data on units by rent class and is interpolated and extrapolated using AHS data on units by rent class. In non-AHS years, this rental value is interpolated and extrapolated from the AHS estimates using the CPI for rent of primary residence. Average expenditures for utilities are calculated as total expenditures for utilities (estimated as described above) divided by total tenant-occupied units.

The rental value of appliances and furnishings provided by property owners is equal to BEA's estimate of depreciation at current replacement cost. For both benchmark and nonbenchmark years, tenants' unreimbursed expenditures for major replacements and for maintenance and repairs—originally reported in the Census Bureau's Survey of Residential Alterations and Repairs—are extrapolated using data from the BLS Consumer Expenditure Survey (CEX).

For *owner-occupied permanent-site homes*, the benchmark estimates of rent per unit are derived using landlord-reported rent receipts and housing values from the Census Bureau's Residential Finance Survey, which is conducted in conjunction with the COH.[25]

1. A unit-weighted average rent-to-value ratio is estimated for each market-value class of one-unit tenant-occupied dwellings.
2. This ratio is multiplied by a midpoint housing value for the class to derive an average rent per unit for each value class.
3. The average rent per unit for each value class is multiplied by the corresponding number of owner-occupied units to derive imputed rent receipts for these units.
4. Rent receipts and owner-occupied units are summed across all value classes and then the former is divided by the latter to derive an imputed average rent for owner-occupied permanent-site homes.

The nonbenchmark annual estimates of owner-occupied contract rent per unit are prepared by extrapolation using the product of (1) the CPI for owners' equivalent rent, which captures changes in the rental value of constant-quality owner-occupied dwellings, and (2) the constant-dollar per-unit value of owner-occupied nonfarm dwellings, which captures changes in the rental value that result from changes in the average quality of these dwellings. The constant-dollar per-unit values are derived by dividing the BEA estimates of constant-dollar net stocks by the corresponding unit stock.

For all years, the rental value of the dwelling alone (or "space rent") for owner-occupied permanent-site homes is derived by multiplying the rent excluding utilities by the number of owner-occupied units and then subtracting BEA's estimate of current-cost depreciation of major appliances.

For *tenant-occupied manufactured homes*, the estimates of rent per unit are derived as rent (which may include utilities) plus separately paid utilities less average utility payments. Benchmark estimates of average rent per unit are based on rental-value- range and unit data from the COH. For *owner-occupied manufactured homes*, gross rent per unit is estimated as the product of rent per unit of tenant-occupied units and the ratio of the average number of rooms in owner-occupied units to those in tenant-occupied units. For nonbenchmark years, average rent is interpolated and extrapolated using median rent from AHS, or for non-AHS years, using the CPI for rent of primary residence. Data on average utility payments are from RECS, interpolated and extrapolated using the product of the number of units and of the CPI for gas (piped) and electricity.

Current quarterly and monthly estimates

[25] According to the SNA, "When well-organized markets for rented housing exist, the output of own-account housing services can be valued using the prices of the same kind of services sold on the market…" (SNA 2008: 6.117).

The quarterly and monthly current-dollar estimates are prepared by reflating the estimates of real PCE for each type of dwelling using the CPI for rent of primary residence for tenant-occupied dwellings and the CPI for owners' equivalent rent of primary residence for owner-occupied dwellings. The monthly estimates in real terms are based on the number of units for each type of dwelling adjusted for changes in the quality of the housing stock. Stocks of permanent-site homes are interpolated and extrapolated from the annual estimates, using monthly Census Bureau data on housing completions. The total stock of manufactured homes is estimated by interpolating and extrapolating from the annual estimates, using monthly Census Bureau data on shipments of manufactured homes (for the advance quarterly estimate, the shipments data are available only for the first 2 months of the quarter). The distributions of the permanent-site stock and of the manufactured home stock between owner-and tenant-occupied units are based on recent trends. The unit estimates are adjusted for changes in the quality of the housing stock based on historical relationships between average rental values and the respective CPIs.

Quantity estimates

The estimates of the real rental value of tenant-occupied nonfarm dwellings are derived by deflation: the CPI for rent of primary residence is used to deflate space rent, and the CPI for major appliances is used to deflate depreciation at current-replacement costs of major appliances and furnishings provided by property owners. The estimates of the real rental value of owner-occupied nonfarm dwellings are derived by deflation using the CPI for owners' equivalent rent of primary residence.

Financial service charges and fees

This PCE services component consists of commercial bank service charges on deposit accounts, commercial bank and nondepository credit intermediation fees on credit card accounts, and other financial service charges and fees.

Commercial bank service charges on deposit accounts

Benchmark estimates are based on Census Bureau's Economic Census data on fees for individual deposit account services (other than ATM and electronic transactions fees) and fees for bundled deposit account services. Nonbenchmark annual estimates are interpolated and extrapolated using data on total service charges on deposit accounts of commercial banks from *Statistics on Depository Institutions* produced by the Federal Deposit Insurance Corporation (FDIC). For the current quarterly estimates, the third estimate is also based on the FDIC data, and the second and advance estimates are judgmentally trended.

Commercial bank and nondepository credit intermediation fees on credit card accounts

Fees on credit card accounts consist of membership fees, cash advance fees, late fees, over-limit fees, and other miscellaneous credit card fees.[26] The benchmark estimates are equal to cardholder fees reported in the economic census times a consumer share based on the noncommercial share of bank card purchases from the *Nilson Report*, a credit-card industry newsletter. Nonbenchmark annual estimates of credit card fees are interpolated and extrapolated using data on bank card dollar-volume data from CardWeb.com Inc. The third quarterly estimate is extrapolated using CardWeb.com Inc. data, and the advance and second estimates are judgmentally trended.

Other financial service charges and fees

This category consists of commercial bank other fee income, savings institution and credit union charges and fees, activities related to credit intermediation charges and fees, and postal money order and money transfer services fees.

Commercial bank other fee income consists of automated teller machine (ATM) and other electronic transactions fees, consumer loan fees, and other fees. Benchmark estimates of ATM and other electronic transactions fees are based on fees for individual deposit accounts reported in the Economic Census. Benchmark estimates of fees on unsecured consumer loans are also based on economic census data. Other fees are based on data on safe deposit box rental charges reported in the BLS Consumer Expenditure Survey. Nonbenchmark annual estimates are interpolated and extrapolated using FDIC data on "additional noninterest income."

[26] Service charges and fees on credit card accounts do not include finance charges, which are included in personal interest payments.

Savings institution and credit union charges and fees consists of service charges on deposit accounts, service charges and fees on credit card accounts, ATM and other electronic transaction fees, and fees on unsecured consumer loans. The benchmark estimates are based on economic census data. Service charges on deposit accounts and ATM and other electronic transactions fees are based on fees for individual deposit accounts, and consumer loan fees are based on fees for unsecured consumer loans. Service charges and fees on credit card accounts equal cardholder fees times a consumer share based on the non-commercial share of bank card purchases from the *Nielsen Report*.

The nonbenchmark annual estimates of PCE for savings institutions are interpolated and extrapolated using the sum of Office of Thrift Supervision (OTS) data on nonmortgage fees and charges for OTS-regulated savings institutions and of FDIC data on service charges on deposit accounts and income from fiduciary accounts of FDIC-regulated savings institutions. For credit unions, the nonbenchmark annual estimates are interpolated and extrapolated using data on fee income and other operating income from the National Credit Union Administration.

Activities related to credit intermediation charges and fees consists of ATM and other electronic transaction fees, automated clearing house (ACH) and other electronic transaction fees, credit card charges and fees, and check cashing and other payment product fees. The benchmark estimates are based on economic census data, including payment product fees of commercial banks and other depository institutions. The nonbenchmark annual estimates are interpolated and extrapolated using BLS Quarterly Census of Employment and Wages data on other activities related to credit intermediation wages and salaries.

For postal money order fees, benchmark and nonbenchmark annual estimates are based on money order fees reported by the U.S. Postal Service, adjusted from a fiscal year basis to a calendar year basis.

For money transfer services fees, benchmark and nonbenchmark annual estimates are based on payment services revenue data from Form 10K annual reports filed by First Data Corporation and Moneygram International with the Securities and Exchange Commission. Revenue data are adjusted to total money transfers and then to transfers originating in the United States based on information from the company reports, and these revenues are then allocated almost entirely to consumers.

The current quarterly estimates of other financial service charges and fees of other depository institutions are judgmentally trended.

The quantity estimates for all components of PCE for financial service charges and fees are prepared by deflation, using the CPI for checking account and other bank services.

Securities commissions

This PCE services component consists of direct commissions on securities transactions, of indirect commissions on securities transactions, and of mutual fund sales charges.

Direct commissions

Direct commissions—those for which an explicit commission is charged—consist of commissions on equities transactions executed on an exchange and of commissions on all other securities transactions, including equities transactions executed on over-the-counter (OTC) markets and transactions in debt securities.[27]

The benchmark estimates of total commissions on equities and on debt securities are based on data from the Census Bureau's Economic Census. Total equities commissions are allocated between exchange-traded equities and equities traded on OTC markets using commissions data by market from Securities and Exchange Commission (SEC) tabulations of Financial and Operational Combined Uniform Single (FOCUS) Reports filed by broker-dealers. Then, commissions charged to other brokers from FOCUS Report data are subtracted to derive commissions charged to the public.

Equities commissions charged to the public are allocated to persons using estimates of shares traded by individuals and institutions and of cents-per-share commission rates. Estimates of shares traded, which reflect the purchasing and selling sides of share volume are derived as follows.

1. For registered exchanges, shares traded by the public equal total shares traded less member trading.
   a. For the New York Stock Exchange (NYSE), share volume and member purchases and sales are reported by the exchange.
   b. For other registered exchanges, share volume is reported by the SEC, and member purchases and sales are estimated by applying the American Stock Exchange member percentage to total purchases and sales.
2. For OTC markets, shares traded by the public equal public-to-public trading and the public side of dealer-to-public transactions.
   a. Public-to-public share volume is based on National Association of Securities Dealers Automated Quotation (NASDAQ) data on electronic communication networks.
   b. Dealer-to-public trading volume is derived from total trading volume and estimates of public-to-public and dealer-to-dealer volume. Total OTC volume is reported by NASDAQ, and dealer-to-dealer volume is based on National Association of Securities Dealers estimates of the share of total volume accounted for by these transactions.

[27] Debt securities consist of negotiable certificates of deposit, commercial paper, bankers acceptances, U.S. Treasury bills, other money market instruments, corporate and trust notes and bonds, U.S. government notes and bonds, and state and local government notes and bonds.

3. The shares of public trading accounted for by individuals on the NYSE, on other registered exchanges, and on OTC markets were each initially based on Securities Industry Association (SIA) reports and are now extrapolated by the household shares of corporate equity holdings based on Federal Reserve Board's Flow of Funds data.

The estimates of cents-per-share commission rates on registered exchanges and on OTC markets are based on total commissions, the institutional and individual percentages of public-share volume, and the assumption that individual commission rates are twice the institutional rates, based on an SEC survey of commission rates.

To the equities commissions charged to individuals are added commissions charged to nonprofit institutions serving households (NPISHs). First, the share of total commissions charged to all nonprofit institutions is estimated using flow of funds data on corporate equity holdings. Then, the NPISH share of the nonprofit commissions is estimated using IRS data on the NPISH share of securities investments of tax-exempt organizations. The allocation of NPISH commissions between registered exchanges and OTC markets is the same as that for individual commissions.

The benchmark estimates of *commissions on debt transactions* are derived as the product of total commissions charged to domestic purchasers and of a consumer share based on the percentage of marketable debt securities held by households from flow of funds data.

For nonbenchmark years, equities commissions on registered exchanges are extrapolated using FOCUS Report data on total commissions on equity transactions executed on exchanges less commissions charged to other brokers. The allocation of commissions charged to individuals and to NPISHs is based on shares traded by individuals and institutions on registered exchanges and on an assumed ratio of individual to institutional commission rates. Other direct commissions, which consist of commissions on OTC equities transactions and on debt transactions, are extrapolated using FOCUS report data on OTC commissions less commissions charged to other brokers. The allocation to individuals is based on shares traded by individuals and institutions on OTC markets and on the assumed ratio of individual to institutional commission rates.

For the current quarterly estimates, FOCUS Report commissions data are used to extrapolate the third estimate, and NYSE round lot and odd-lot share volume and NASDAQ OTC share volume are used to extrapolate the second and advance estimates.

The estimates of real direct commissions on exchange-listed equities are prepared by deflation, using the "PPI for brokerage services, exchange-listed equities." Direct commissions on OTC equities and on debt transactions are deflated using the "PPI for brokerage services, all other securities."

Indirect commissions

Indirect commissions—those for which the commission is charged indirectly through a dealer markup or "spread"[28]—comprise commissions on OTC equity securities and other indirect commissions, which consist of gains from specialist transactions in equities on registered exchanges and from brokering and dealing debt securities and derivatives.[29]

The benchmark estimates of total indirect commissions on equities, debt securities, and derivatives are based on data from the economic census on net gains (excluding interest income) in trading accounts for brokering and dealing securities. For equities, the allocation of total indirect commissions to persons is made using the personal share of equities holdings (including NPISHs and bank personal trusts and estates). The personal share of equities holdings is based on averages of yearend holdings from flow of funds data. Total PCE for indirect commissions on equities transactions is allocated between OTC markets and registered exchanges using estimates based on total shares sold and cents-per-share spreads.

- For OTC markets, individual purchases from dealers are equal to total dealer sales to the public less purchases by institutions. Total dealer sales to the public is derived by subtracting dealer-to-dealer and public-to-public share volume from the total and using a BEA assumption that one-half of the remaining dealer-to-public transactions is accounted for by sales. The institutional share of OTC transactions is based on SIA reports. Average cents-per-share spreads are from NASDAQ, extrapolated by the "PPI for dealer transactions, market making in over-the-counter equities."
- For registered exchanges, the NYSE ratio of specialist sales to total purchases and sales is applied to total purchases and sales on all registered exchanges to derive total specialist sales. The individual share of specialist sales is based on SIA reports. Average cents-per-share spreads are assumed to equal the volume-weighted spread for NYSE specialists as reported by the exchange.

To indirect commissions charged to individuals are added commissions charged to NPISHs, based on the nonprofit share of total corporate equity holdings from flow of funds data applied to total indirect commissions and an allocation of nonprofit commissions to NPISHs based on IRS data.

The benchmark estimates of indirect commissions on transactions in U.S. government and agency securities, in municipal securities, and in corporate debt securities are allocated to persons using the personal share of holdings (including NPISHs and bank personal trusts and estates). The personal share of equities holdings is based on averages of yearend holdings from flow of funds data. The allocation of

[28] Dealers who make markets in securities do not charge commissions; instead, they retain as compensation the income resulting from acquiring securities at a price lower than the price at which the securities are subsequently sold to their customers.
[29] Derivatives consist of futures contracts, option contracts, forward contracts, swaps, and other derivative contracts.

benchmark estimates of commissions on derivatives to persons is based on an assumed 15-percent share.

For nonbenchmark years, PCE for indirect commissions on OTC equities is extrapolated by the product of OTC share volume (excluding matched volume) from NASDAQ and of the "PPI for dealer transactions, market making in over-the-counter equities." PCE for other indirect commissions is estimated in three parts: specialists' gains on equities trading on registered exchanges, gains on brokering and dealing debt securities, and gains on brokering and dealing derivatives.

- Specialists' gains are extrapolated by specialists' sales from the NYSE.
- Gains on debt securities are estimated for U.S. government securities, for U.S. government agency and government-sponsored enterprises securities, for state and local government debt securities, for corporate debt securities, and for open-market paper. In each case, total indirect commissions are extrapolated by the value of trading and allocated to persons (including NPISHs) based on the share of each type of security held by persons, based on flow of funds data. The source for U.S. government and for agency securities is total primary dealer sales excluding other brokers and dealers, from Federal Reserve Bank of New York (FRBNY) data. For state and local government securities and for corporate debt securities, the value of trading is from the Securities Industry and Financial Markets Association (SIFMA). For open-market paper, the source is primary dealer volume with others in corporate debt securities due in less than 1 year, from FRBNY data.
- Derivatives commissions are extrapolated in two parts: options and future and forward contracts. Options commissions are extrapolated using SEC data on the value of options trading. Commissions on futures and forward contracts are extrapolated using futures contracts data from the Futures Industry Association.

The current quarterly estimates of indirect commissions of OTC equities transactions are extrapolated using the value of OTC trading from NASDAQ. Other indirect commissions are extrapolated using FRBNY data on dealer transactions with others in U.S. government, federal agency, and government-sponsored enterprise securities.

The estimates of real OTC equities commissions are prepared by deflation, using the "PPI for dealer transactions, market-making in over-the-counter equities." For other indirect commissions, the "PPI for dealer transactions, debt securities, and all other trading" is used as the deflator.

Broker charges on mutual fund sales

The benchmark estimates of total broker charges on mutual fund sales are based on economic census data. Charges for nonbenchmark years are interpolated and extrapolated using data on revenue from the sale of investment company securities from the FOCUS Report. Commissions are allocated to individuals, fiduciaries, and nonprofits based on data on their respective shares of mutual fund assets from the Investment Company Institute (ICI). For current quarterly estimates, the third estimate is extrapolated using data on charges on the sale of investment company securities from the FOCUS Report, and the second and advance estimates are extrapolated using data on sales of mutual fund shares reported by the ICI. The estimates of real broker charges on mutual fund sales are derived by quantity extrapolation, using an indicator equal to mutual fund sales from the ICI deflated by the all-items CPI.[30]

[30] For a general description of the quantity extrapolation method, see the section "Estimates for detailed components" in chapter 4.

Financial services furnished without payment

Financial services furnished without payment includes depository institutions—commercial banks, savings institutions, and credit unions—and regulated investment companies (mutual funds), which provide services to persons without explicitly charging for these services.[31] This component also includes pension plans—private pension plans and publicly administered government employee retirement plans—which earn property income (dividend and interest income) on plan reserves that have been contributed directly by employers and employees and are held on behalf of beneficiaries to be paid out to them as annuity or lump-sum distributions of income in the future.[32] In the NIPAs, the value of these types of services is imputed to PCE as financial services furnished without payment in order to make PCE invariant to whether the charges are implicit or explicit.

In the NIPAs, imputations are made for the value of the services (such as check clearing, recordkeeping, and investment services) that are provided by depository institutions.[33] For commercial banks and other depository institutions, services to borrowers are estimated as the difference between the rate of return on loans and a riskless "reference rate"—measured as the average rate earned by banks on U.S. government and agency securities[34]—times the value of loans that involve direct customer contact.[35] Services to depositors are estimated as the difference between the reference rate and the rate paid on deposits times the value of deposits that involve direct customer contact. These estimates are based on the premise that rather than pay explicit fees, borrowers accept a higher interest rate, and depositors a lower rate, than they would otherwise. The differences in interest rates are used to infer the implicit value of the services that the banks are providing to their customers. Interest flows are adjusted because a portion of the money paid as interest by borrowers represents a payment for these services and because the interest forgone by depositors reflects the value of the services they receive.

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[31] The value of these services to government is imputed to government consumption expenditures and that to foreigners is imputed to exports of services. For business, these services are considered intermediate consumption and cancel out in the consolidation of the production account of the business sector.

[32] Rental income is also earned by pension plans, but this amount is assumed to be small.

[33] See Brent R. Moulton and Eugene P. Seskin, "Preview of the 2003 Comprehensive Revision of the National Income and Product Accounts," *Survey* 83 (June 2003): 23–27; see also Dennis J. Fixler, Marshall B. Reinsdorf, and George M. Smith, "Measuring the Services of Commercial Banks: Changes in Concepts and Methods," *Survey* 83 (September 2003): 33–44.

[34] The calculation of the reference rate excludes mortgage-backed securities.

[35] As part of the 2013 comprehensive update of the NIPAs, the estimates of the output of commercial banks were improved (1) by limiting the set of assets and liabilities included in the calculations to mainly loans and deposits, (2) by removing from borrower services an estimate of expected losses in principal as a result of borrower default, and (3) by refining the computation of the reference rate to reduce the volatility in borrower and depositor services. For more information, see Kyle K. Hood, "Measuring the Services of Commercial Banks in the National Income and Product Accounts: Changes in Concepts and Methods in the 2013 Comprehensive Revision," *Survey* 93 (February 2013): 8–19. As part of the 2018 comprehensive update, the same improvements were applied to the estimates for other depository institutions. See Jason W. Chute, Stephanie H. McCulla, and Shelly Smith, "Preview of the 2018 Comprehensive Update of the National Income and Product Accounts: Changes in Methods, Definitions, and Presentations," *Survey* 98 (April 2018).

Imputations are also made for the value of the services that are provided by regulated investment companies (RICs) to their shareholders. These imputed service charges are equal to the operating expenses of the RICs.

The imputations for these services are recorded in the Personal Income and Outlay Account of the summary NIPAs as follows.[36] Personal interest income (and personal income) is raised by an amount equal to the imputed service charges for the depositor and investor services. In personal outlays, PCE is raised by the sum of the imputed service charges for depositor and investor services and for borrower services, and personal interest payments is reduced by the imputed service charges for borrower services, since a portion of the interest payment is assumed to represent a fee for unpriced borrower services. Thus, personal outlays is raised by the same amount as personal interest income, and personal savings is not affected by the imputations.

In the NIPAs, pension plans are regarded as charging participants an implicit fee that is equal to the plans' administrative expenses for the package of imputed services provided. The property income of pension plans is recorded in personal income as monetary interest, as imputed interest on unfunded liabilities, and as dividends, and the difference between this property income and the imputed fees is included in personal savings. The benefit payments associated with pension plans are treated as transfers from the pension subsector (included in the financial corporate sector) to the personal sector.[37] In effect, the NIPA treatment performs a timing change so that the property income that has been accrued to the plan beneficiaries is recorded as if it were actually disbursed to them in the current period.

Commercial banks, savings institutions, and credit unions

The value of implicit commercial bank and other depository institutions 'services to depositors is based on average deposit balances and on a "user-cost price" that is calculated as the difference between the reference rate and the interest rate paid on deposits. Similarly, the value of commercial bank and other depository institutions' services to borrowers is based on average loan balances and on a user-cost price that is calculated as the difference between the interest rate earned on loans and the reference rate. The estimates of deposits and of loan balances, of interest paid and received on deposits and loans, and of the reference rate for commercial bank and savings institutions are based on data from the Federal Financial Institutions Examination Council's (FFIEC) *Call Reports*. For credit unions, the measures are based on data from the National Credit Union Association's (NCUA) Call Report Form 5300.

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[36] For a discussion of the summary NIPAs, see "Chapter 2: Fundamental Concepts" in this handbook.
[37] As part of the 2013 comprehensive update of the NIPAs, the treatment of pension plans was improved by recording the transactions of defined benefit pension plans on an accrual basis and by recognizing the costs of unfunded liabilities. For more information, see "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts," *Survey* 93 (March 2013): 21–25.

For each type of deposit and for loans[38] in domestic offices of U.S. chartered banks, an average rate of interest is derived from the average balance and interest income or expense, and the user-cost price is calculated as the difference between the average interest rate and the reference rate. The value of the implicit service is calculated by applying the user-cost price to the average deposit or loan balance, with an adjustment to include balances in U.S. offices of foreign banks. Imputed services to depositors are equal to the sum of services to all types of deposit accounts—demand deposit accounts (noninterest-bearing checkable deposits) and interest-bearing accounts (checkable deposit accounts, savings accounts, and time deposit accounts)—except intrabank deposits.

The share of total imputed demand-deposit services that is allocated to persons is based on the share of demand deposits held by persons. This share was initially based on a since-discontinued Federal Reserve Board (FRB) survey of demand deposit ownership. The personal share of demand deposits is no longer available, so the original estimate from the FRB survey is extrapolated using the household share of transactions deposits (which include interest-bearing checkable deposits as well as demand deposits) as follows. FFIEC data on total transactions deposits in domestic offices are adjusted to exclude deposits held by commercial banks and other depository institutions, and deposits held by individuals, partnerships, and corporations are calculated as a percentage of the adjusted total. FRB Financial Accounts of the U.S. data on the distribution of checkable accounts among households and types of business are then used to determine the household share of the adjusted transactions deposits.

For interest-bearing deposits, there are no data on the share of these deposits held by persons, so the allocation of implicit services to persons is based on the household share of interest-bearing deposits excluding checkable deposits (which include money market deposit accounts, other savings deposits, and time deposits) derived from FFIEC and flow of funds data. The FFIEC total of these deposits is adjusted to exclude holdings of foreign governments and official institutions, and the percentage of deposits held by individuals, partnerships, and corporations is calculated. Flow of funds data on the distribution of savings and time deposits among households and types of businesses are then used to determine the household share of the adjusted deposits total.

The imputed borrower services are allocated to persons based on FFIEC data on the share of outstanding loans that is accounted for by credit card and other consumer loans.

Annual quantity estimates. The annual estimates of real PCE for commercial bank services are derived using a BLS banking output index that is based on volume measures for the deposit, loan, and trust functions of commercial banks. There are component indexes for U.S.-owned banks and for U.S. offices of foreign banks, each of which use employment weights that are based on data from the Federal Reserve Banks' *Functional Cost Analysis Report*.

[38] Also includes capital leases.

- For U.S.-owned banks, the BLS deposit index consists of a demand deposit component, based on the number of checks processed and the number of electronic transactions; a time deposit component, based on estimated deposits and withdrawals; and an ATM component, based on ATM and point-of-sale volume. The BLS loan index is based on the number of real estate, consumer, and commercial loans outstanding and on the volume of credit card transactions.
- For U.S. offices of foreign banks, the indexes for deposits and for loans are based on the number of deposit accounts and loans, which are estimated from the total value loans reported in the FRB *Share Data for the U.S. Offices of Foreign Banking Organizations* report and on average deposit and loan sizes.

The U.S.-owned and foreign-owned banking output indexes are combined using revenue data from the Census Bureau's Economic Census that are extrapolated by assets and aggregated using a Tornqvist aggregation procedure.

The BLS banking output index is used to extrapolate the total value of priced and unpriced banking services from the base-year value. From the extrapolated value, the real-dollar value of explicit service charges and fees (see the section "Financial service charges and fees") is subtracted to obtain the real-dollar value of unpriced banking services, which is then allocated to persons in the same proportion as the current-dollar estimates. For the most recent year, the BLS banking output index is extrapolated using available data on deposit, loan, and trust activity.

The annual estimates of the real implicit services provided by other depository institutions are derived by deflation, using the PCE implicit price deflator for services furnished without payment by commercial banks.

Current quarterly estimates. For the current-dollar estimates, the third quarterly estimate for commercial bank and other depository institutions' services is derived by extrapolation, using FFIEC data on deposit and loan values, on interest paid and received, and on the reference rate. The second and advance estimates are judgmentally trended. The current quarterly estimates of real commercial bank services are judgmentally trended. The current quarterly estimates of real other depository institution services are prepared by deflation, using the implicit price deflator for financial services furnished without payment for commercial bank services.

Regulated investment companies

The total value of imputed services of RICs equals their operating expenses. These expenses are measured as "total deductions" from IRS income statement data on open-end investment funds, plus securities commissions and "services furnished without payment" by other financial intermediaries. Securities commissions include direct commissions paid on equities and options transactions and indirect commissions paid on equities, debt securities, and options transactions. For the most recent year, "total deductions" are extrapolated using data on mutual fund total net assets from the Investment Company Institute (ICI).

For all years, direct commissions paid by RICs are estimated as a share of total institutional commissions paid by U.S. residents. The methodology used to derive the estimates of total direct commissions charged to the public and of individual and institutional commissions is described in the section "Securities commissions." Commissions paid by foreign residents, which are included in institutional commissions, are estimated by applying the foreign share of the value of total purchases and sales of U.S. equities to total commissions charged to the public. The value of foreign residents' transactions in U.S. equities is from BEA's International Transactions Accounts data; the value of total purchases and sales is from the New York Stock Exchange, the National Association of Securities Dealers Automated Quotation System for over-the-counter markets, and the Securities and Exchange Commission for other registered exchanges. The RIC share of institutional commissions paid by U.S. residents is equal to equity holdings of mutual funds as a percentage of total equity holdings of domestic institutions, based on flow of funds data.

The share of total indirect commissions that is accounted for by RICs is estimated separately for equities, U.S. treasury securities, U.S. government agency and government-sponsored enterprise securities, municipal securities, corporate debt securities, and options transactions. The derivation of total indirect commissions for all types of securities is described in "Securities commissions." For each type of security except options, the allocation to RICs is based on the RIC share of total marketable securities averaged from yearend flow of funds data. The allocation of indirect commissions on options transactions assumes the same distribution as that for the total on debt and equity securities net transactions.

The allocation to persons of RIC services is based on flow of funds data on the share of mutual fund assets that are held by the household sector.

"Services furnished without payment" by other financial intermediaries comprise the implicit depositor services of depository institutions. These services are allocated to RICs in proportion to the RIC shares of deposits, which are derived by the same method as described above for commercial banks and other depository institutions.

Annual quantity estimates. The annual estimates of real implicit RIC services are derived by deflation. A BEA input cost index—based on several PPI components and on the average hourly earnings for the portfolio management sector from BLS Current Employment Statistics (CES)—is used as the deflator.

Current quarterly estimates. The current-dollar quarterly estimates of implicit RIC services are extrapolated using a 3-month moving average of mutual fund total net assets from the ICI. The estimates in real terms are prepared by deflation, using a BEA input cost index that is based on several PPI components and on monthly average hourly earnings data for portfolio management from BLS Current Employment Statistics (CES).

Pension plans

For private pension plans, the annual estimates of PCE are calculated as the sum of reported expenses of private defined benefit pension plans and of securities commissions paid by these plans. Reported expenses are based on BEA tabulations of annual report data (Form 5500) from the Department of Labor's Employee Benefits Security Administration. Reported expenses are not available for the most recent 2 years, so the estimates for those years are judgmentally trended. Securities commissions include both direct and indirect commissions on equity and debt securities and on options and are estimated as described in "Securities commissions." These commissions are allocated to pension plans using flow of funds data on the distribution of securities holdings.

For publicly administered government employee retirement plans, the annual estimates of PCE are calculated as the sum of the administrative expenses of the federal government plans and the administrative expenses and indirect securities commissions of the state and local government plans. The estimates of the administrative expenses for the federal plans—which consist of federal civilian and military retirement funds, the Thrift Savings Plan, and the Uniformed Services Retiree Health Care Fund—are based primarily on data from the U.S. Department of Treasury's *Monthly Treasury Statement*. The estimates of the administrative expenses for the state and local government employee retirement plans are based on retirement systems data from the Census Bureau's annual Survey of Government Finances. The estimates of indirect commissions on securities transactions are described in "Securities commissions" and are allocated to state and local government pension funds using flow of funds data.

For the most-recent-year, the expenses of pension plans are extrapolated using BLS Quarterly Census of Employment and Wages (QCEW) data on pension fund industry wages and salaries. The current quarterly estimates are judgmentally trended.

The estimates of real PCE for pension plans are prepared by deflation, using a BEA composite index of input prices. For this index, compensation costs are based on average industry wages and salaries from the QCEW, and purchased goods and services costs are based on a combination of price indexes from BLS and BEA. For the current quarterly estimates of compensation costs, the QCEW data are extrapolated using CES average hourly earnings.

Life insurance

Life insurance carriers—legal reserve life insurance companies, fraternal benefit societies, and mutual savings banks—provide services that combine elements of both insurance and saving. These institutions earn property income (dividend, interest, and rental income) on insurance reserves that have been contributed directly by, or are held for the benefit of, policy holders and that will be paid out to the beneficiaries as annuity or lump-sum distributions of income in the future.

In the NIPAs, life insurance carriers are regarded as charging policyholders an imputed fee that is equal to the institutions' operating expenses for the package of services provided. The imputations for the value of these services are recorded in the Personal Income and Outlay Account of the summary NIPAs as follows.[39]

- The imputed fees are treated as personal outlays and are recorded as "life insurance" in PCE.
- The property income of life insurance carriers is recorded as "imputed interest received from life insurance carriers" in personal interest income. The underwriting income of life insurance carriers (premiums less benefits) is treated as a transfer payment within the personal sector; such intra-sectoral transactions are not recorded in the NIPAs.
- The savings of life insurance carriers is consolidated with that of the personal sector. Personal saving is raised by the amount that the property income of these institutions exceeds the imputed fees that are added to PCE.

In effect, the NIPA treatment performs a timing change so that the property income that has been accrued to policy holders is properly recorded as if it were actually disbursed to them in the current period. In the absence of these imputations, the investment returns and the increases in life insurance reserves would be included in business and government income and saving rather than in personal income and saving.

For *legal reserve life insurance carriers*, operating expenses consist of all expenses related to life insurance and pension activities, including the following: financial investment expenses, profits of stock life insurance companies, direct and indirect commissions paid on securities transactions, and imputed services purchased from commercial banks. Expenses related to life insurance and pension activities are reported on annual statements filed with state insurance commissioners; expenses related to real estate activities and to accident and health insurance are not included. For stock life insurance companies, profits are included because they belong to shareholders in the companies; however, profits of mutual insurance companies are not included because they belong to policyholders.

For *domestic legal reserve companies*, the benchmark and nonbenchmark annual estimates of operating expenses, except for the most recent year, are based on aggregates prepared by A.M. Best Company. The following items in the A.M. Best Company data

[39] For a discussion of the summary NIPAs, see "Chapter 2: Fundamental Concepts" in this handbook.

are considered current expenses: commissions paid on premiums and annuity considerations; general insurance expenses; investment expenses; insurance taxes, licenses, and fees; and other miscellaneous expenses. Commissions paid on premiums and annuity considerations, which measure only commissions on direct insurance business, are adjusted to a measure of total net commissions paid by adding commissions paid on reinsurance assumed and by subtracting commissions received on reinsurance ceded.

Because the annual statements of domestic companies consolidate their activities worldwide, the expenses of their operations in foreign countries must be subtracted in order to derive expenses chargeable to U.S. residents. In addition, the expenses of foreign life insurance companies operating in the United States must be added. Benchmark estimates of the expenses of domestic companies abroad are estimated using the relationship between domestic premium receipts and total premium receipts from the American Council of Life Insurers' (ACLI) Life Insurance Fact Book. Benchmark estimates of the expenses of foreign companies operating in the United States are estimated by calculating the ratio of U.S. residents' premium payments to Canadian companies to their payments to U.S. companies, based on ACLI Fact Book, and applying this ratio to the expenses of domestic companies chargeable to U.S. residents. For nonbenchmark years, the net of these geographic adjustments is extrapolated by the operating expenses of domestic legal reserve companies.

Estimates of the profits of stock life insurance companies are based on IRS tabulations of corporate tax returns. Direct and imputed commissions on securities transactions are derived as described in the section "Securities commissions" and are allocated to life insurers using holdings data by type of security from the Federal Reserve Board's Flow of Funds data. The estimates of imputed interest paid by commercial banks are described in the section "Services furnished without payment by financial intermediaries" and are also allocated to life insurers using flow of funds data.

For *fraternal benefit societies and mutual savings banks*, data on current expenses are not available. PCE for these institutions is estimated as premiums less benefits and less dividends paid to members and beneficiaries. For the fraternal benefit societies, estimates are based on data from the National Fraternal Congress of America. For mutual savings banks, estimates are based on data from the ACLI fact book. In recent years, the estimates have been judgmentally trended.

For the most recent year, data on life insurance industry wages and salaries from the BLS Quarterly Census of Employment and Wages (QCEW) are used to extrapolate PCE for life insurance. For the current quarterly estimates, BLS Current Employment Statistics (CES) data on earnings are used as the extrapolator.

The estimates of real PCE for life insurance carriers are prepared by deflation, using a BEA composite index of input prices. For this index, compensation costs are based on CES average hourly earnings data, and purchased goods and services costs are based on a combination of price indexes from BLS and BEA.

Property and casualty insurance

Property and casualty insurance comprises three PCE services components: net household insurance, private workers' compensation, and net motor vehicle and other transportation insurance. Household insurance consists of the following lines of insurance: homeowners' multiple peril, farm owners' multiple peril, inland marine,[40] and earthquake. Private workers' compensation consists of insurance provided by commercial companies and of self-insurance by employers. Motor vehicle insurance consists of private passenger auto liability and private passenger auto physical damage.

Property and casualty insurance companies provide three types of financial services to policyholders:

- risk-pooling services, which enable consumers and others exposed to property and casualty losses to reduce their individual risk;
- loss-related services—such as loss settlements, risk surveys, and loss prevention plans; and
- intermediation services, whereby policyholders earn property income (interest, dividend, and rental income) on the investment of funds in "technical reserves," which consist of premiums paid by policyholders in advance of coverage periods and of casualty losses incurred by insurers but not yet disbursed to policyholders.[41]

In the NIPAs, the three types of property and casualty insurance services are each measured as total premiums less "normal" losses incurred. Total premiums consist of premiums earned plus "premium supplements" less dividends payable to policyholders. Premiums are paid directly by policyholders and are earned by the insurers during the risk period covered. Premium supplements equal the expected investment income on technical reserves, including capital gains. According to the international *System of National Accounts* (SNA), "the insurance company invests the premium, and the property income is an extra source of funds to meet any claim due. The property income represents income foregone by the client and so is treated as an implicit supplement to the actual premium."[42]

The NIPA measure of insurance services recognizes that in most periods, the insurance premiums received and the investment income earned provide the funds needed by insurance companies for a normal, or expected, level of insurance claims and insurance services and for additions to reserves. In setting their premiums, these companies do not yet know the actual loss in the period; thus, an estimate of normal losses—that is, the losses that insurers expect to pay—rather than actual losses is used in

[40] Inland marine insurance consists of coverage of goods transported by land and of transportable business property and personal property (such as bicycles, furs, and jewelry).
[41] Technical reserves are funds on which policyholders have a legal claim, so they are recognized as assets belonging to them. Insurers also invest "own funds," which belong to the companies' stockholders.
[42] SNA 2008: 6.184.

calculating the value of insurance services.[43] Expected losses are estimated using a model based on the past pattern of claims payable by the insurer. Under this treatment, actual losses less normal losses, referred to as "net insurance settlements," reflect the net value of the transfer-like flows between the policyholders and the insurance companies.[44] Net insurance settlements consist of disaster-related losses and of other net insurance settlements.[45]

In the absence of the imputations for premium supplements and normal losses, property and casualty insurance services would be measured as direct premiums earned less actual losses incurred and dividends to policyholders. However, policyholders pay a smaller premium than they would in the absence of investment income, so premiums alone do not fully account for the cost of insurance services. In addition, the use of actual losses would result in a volatile measure of insurance services because of the large swings in insurance payments that result from catastrophic losses. This treatment is consistent with that recommended in the SNA, in which non-life insurance output is measured as "total premiums earned, plus premium supplements, less adjusted claims incurred," which are defined as the claims that the insurance company expects to pay.[46]

The treatment of property and casualty insurance services provided to persons is recorded in the Personal Income and Outlay Account of the summary NIPAs as follows.[47]

- The insurance services are treated as personal outlays and are recorded in PCE according to the type of insurance provided.
- The expected investment income on technical reserves (premium supplements) of the insurance categories in PCE is classified as imputed interest and included in personal interest income (a part of personal income receipts on assets in personal income).
- PCE for the premium supplements and the associated imputed personal interest income are both raised by the same amount, so personal saving is not affected.
- Private workers' compensation premiums, entirely paid by employers and including self-insurance, are included in employer contributions for employee pension and insurance funds (a part of supplements to wages and salaries in

[43] See Brent R. Moulton and Eugene P. Seskin, "Preview of the 2003 Comprehensive Revision of the National Income and Product Accounts," *Survey* 83 (June 2003): 19–23; see also Baoline Chen and Dennis J. Fixler, "Measuring the Services of Property-Casualty Insurance in the NIPAs," *Survey* 83 (October 2003): 10–26.

[44] These flows do not meet the strict definition of a "transfer"—that is, a payment for which nothing is provided in return—because the payment is made as part of a contract between the policyholder and the insurance company. However, these flows are similar to transfers in that they reflect the part of the payments that are not associated with the purchase of insurance services, so they are included in business transfer payments in the NIPAs.

[45] In the 2009 comprehensive update of the NIPAs, BEA changed the treatment of disasters to better reflect the distinctions between current transactions, capital transactions, and events that directly affect balance sheets and to bring the NIPAs in line with the recently updated SNA. See Eugene P. Seskin and Shelly Smith, "Preview of the 2009 Comprehensive Revision of the NIPAs: Changes in Definitions and Presentations," *Survey* 89 (March 2009): 11–15.

[46] SNA 2008: 6.185–6.189.

[47] For a discussion of the summary NIPAs, see "Chapter 2: Fundamental Concepts" in this handbook.

personal income).

- Net insurance settlements other than disaster-related losses are included in "other current transfer receipts from business (net)" (a part of personal current transfer receipts in personal income).[48]

Annual estimates

The annual estimates of property and casualty insurance except for the most recent year are derived using data from *Best's Aggregate and Averages: Property/Casualty* by A.M. Best Company on direct premiums earned, direct losses incurred, net investment income, and dividends to policyholders. For each line of insurance included in PCE, normal loss ratios are derived for each year as the exponentially weighted moving average of the actual loss ratios—that is, the ratio of actual direct losses incurred to direct premiums earned—of past years. For insurance lines affected by catastrophic losses, the years for which loss ratios are affected are treated as missing observations in the calculation of the normal loss ratios. The catastrophic loss is then computed as the difference between the actual loss ratio and the normal loss ratio applied to direct premiums earned, and the catastrophic loss is spread forward equally over 20 years. Normal losses for each year are derived as the normal loss ratio multiplied by direct premiums earned. Similarly, the expected investment income ratio for each year is derived as the exponentially weighted moving average of the investment income to premiums ratios of past years.[49] Premium supplements for each year are then derived as the expected investment income ratio multiplied by the direct premiums earned.

Once data for premium supplements and normal losses are derived, these data and the A.M. Best data on direct premiums and dividends paid are used to derive total insurance services for each line of insurance. Because the A.M. Best data cover the consolidated worldwide operations of U.S. insurance companies, insurance operations in foreign countries must be excluded from total insurance services; this adjustment is accomplished by using A.M. Best data on direct business in foreign locations, by line of insurance. Data on total imports of property and casualty insurance are from BEA's International Transactions Accounts; the total is separated out by line based on the distribution of property and casualty insurance reflected in BEA's Benchmark Input-Output (I-O) Accounts for the United States, which are released approximately every 5 years. Distributions by line of insurance are derived by straight-line interpolation for the years between I-O benchmarks and are held constant for the years following the most recent benchmark. These adjustments to output measures based on A.M. Best data provide estimates of insurance to U.S. residents by line of insurance.

For each line of insurance included in PCE, the portion accounted for by personal use is estimated as follows:

[48] Disaster-related losses are treated as capital transfers.
[49] For detail on the estimation of expected loss ratios and expected income ratios, see Chen and Fixler (2003).

- For homeowners' multiple peril insurance, the portion that covers renters and condominium owners is estimated using data from the National Association of Insurance Commissioners on premiums written as a share of total homeowners' multiple peril premiums; this portion is allocated entirely to PCE. The remaining portion of homeowners' insurance, which covers owner-occupied (non-condominium) dwellings and which accounts for about 94 percent of total coverage, is allocated to PCE using information on coverage limitations for household contents relative to dwelling values. This information indicates that household contents coverage is about 20 percent of the value of dwelling coverage.
- This 20-percent ratio is also used in the PCE allocation of farm owners' multiple peril and earthquake insurance.
- Insurance on personal property is estimated to account for 27 percent of the total for inland marine insurance, based on information from the Inland Marine Underwriters Association and the American Association of Insurance Services.
- For private workers' compensation, all of domestic supply is attributed to persons, to which are added estimates of self-insured premiums and benefits paid by employers.
- For motor vehicle insurance, the services covering business use of household owned-vehicles is excluded, based on the business portion of mixed-use household motor vehicles.

Most-recent-year and current-quarterly estimates

A.M. Best data are released with a 9-month lag; therefore, for the most recent year, estimates of direct premiums by line of insurance are extrapolated using A.M. Best estimates of net premiums in written contracts from its Best's *Review & Preview* report on property and casualty insurers published in January of each year. Premium supplements and dividends are extrapolated based on forecasts of investment income growth rates. Normal losses are extrapolated using the growth in the combined ratios for business lines and for personal lines. The current quarterly estimates are judgmentally trended.

Quantity estimates

For household insurance, total premiums and benefits are deflated separately, using the PPI for homeowners' insurance. For private workers' compensation, premiums and benefits are deflated separately, using the PPI for worker's compensation insurance. For motor vehicle insurance, premiums and benefits are deflated separately, using the PPI for private passenger auto insurance.

Nonprofit institutions serving households

In the NIPAs, nonprofit institutions serving households (NPISHs), which have tax-exempt status, are treated as part of the personal sector of the economy. Because NPISHs produce services that are not generally sold at market prices, the value of these services is measured as the costs incurred in producing them.

In PCE, the value of a household purchase of a service that is provided by a NPISH consists of the price paid by the household or on behalf of the household for that service plus the value added by the NPISH that is not included in the price. For example, the value of the educational services provided to a student by a university consists of the tuition fee paid by the household to the university and of the additional services that are funded by sources other than tuition fees (such as by the returns to an endowment fund).

NPISHs are accounted for in PCE by their "final consumption expenditures," which equal their gross output less sales to other sectors of the economy (such as sales of education services to employers) and less sales to households. The gross output of NPISHs is equal to their current operating expenses less sales to households that are not related to the NPISHs' primary activity (such as room and board charges by colleges and universities). Operating expenses consist of compensation costs, purchased goods and services except for capital outlays, and the imputed rental value of structures and equipment owned by NPISHs. Capital outlays consist of the value of purchased buildings and of equipment and software as well as the value of investment goods such as software that are produced directly by the NPISHs. The imputed rental value of structures and of equipment and software owned by NPISHs equals the sum of interest paid, depreciation at current replacement cost, and property taxes. Sales of services by NPISHs to households are subtracted from the NPISH expenses because these sales are accounted for in household consumption expenditures in PCE.

In the PCE tables, NPISH final expenditures are not distributed among the individual categories but are shown as a separate entry. NPISH sales of services to households are accounted for in the following PCE categories:

- Health
  - Outpatient services
  - Hospitals
  - Nursing homes
- Recreation
  - Membership clubs and participant sports centers
  - Performing arts
  - Museums and libraries
  - Other recreation services
- Education
  - Higher education
  - Nursery, elementary, and secondary schools
  - Commercial and vocational schools

  - Research
- Social services
  - Child care
  - Individual and family services
  - Vocational rehabilitation services
  - Community food and housing services
  - Homes for the elderly
  - Residential mental health and substance abuse
  - Other residential care facilities
- Religious organizations
- Foundations and grantmaking and giving organizations
- Social advocacy organizations
- Civic and social organizations
- Professional, labor, political, and similar organizations and legal services

Benchmark and annual estimates

The benchmark estimates of gross output and of sales for the following types of NPISHs are based on data on expenses and receipts from the Census Bureau's Economic Census: *health, recreation, nursery schools, commercial and vocational schools, research, social services, foundations and grantmaking and giving organizations, social advocacy organizations, civic and social organizations, and professional and similar organizations and legal services*. The expense data on depreciation is adjusted to a replacement-cost basis using BEA estimates of current- and historical-cost depreciation. The receipts data provide sales of both primary services and of unrelated and secondary sales. The annual estimates for all of these types of NPISHs are based on data on expenses and receipts from the Census Bureau's Service Annual Survey.

The benchmark and annual estimates for *higher education* are based on expenses and receipts data from the National Center for Education Statistics (NCES), adjusted from a school-year basis to a calendar-year basis. Expenses include instruction, public service, academic support, student services, institutional support, and operation and maintenance of plant, less sales and services of educational activities. The expense data on depreciation are adjusted to a replacement-cost basis using BEA estimates of current- and historical-cost depreciation. For the second most recent year, expense data for the first of the 2 school years needed for adjustment to a calendar-year basis are available, and expenses for the second year are extrapolated using BLS Current Employment Statistics (CES) employment data times the CPI for all items. For the most recent year, calendar-year expenses are extrapolated using CES employment times the all-items CPI.

The benchmark estimates of *elementary and secondary schools* expenses are based on NCES estimates of total expenditures adjusted from a school-year basis to a calendar-year basis and adjusted to exclude capital outlays, scholarships and fellowships, and unrelated sales and to include in-kind wages and depreciation valued at current replacement cost. The annual estimates are extrapolated using the NCES expenditures estimates, adjusted from a school-year basis to a calendar year basis. The benchmark

estimates of tuition and fee sales to households are based on the application of tuition-to-expense ratios from the National Catholic Education Association. The annual estimates are extrapolated using a tuition-revenue indicator equal to enrollment times average tuition rates from the NCES when available; enrollment is extrapolated for the most recent years using Census Bureau estimates of the population aged 5 to 17, and average tuition is extrapolated using the CPI for elementary and high school tuition and fees.

The benchmark estimates for *religious organizations* expenses and sales are based on a study of church finances by the Independent Sector, an advocacy group for nonprofit organizations. The annual estimates are extrapolated using contributions data from the National Council of Churches' *Yearbook of American and Canadian Churches* through 2010. For 2011 forward, the annual estimates are extrapolated using Giving USA's Annual Report of Philanthropy. The estimates for the most recent year are extrapolated using QCEW wage data.

The benchmark estimates for *labor organizations* expenses are based on total industry wages from the QCEW, to which is applied a ratio of expenses to wages and salaries from IRS data on labor, agriculture, and horticultural organizations. A ratio of membership dues to wages and salaries from the IRS data is applied to QCEW wages to derive sales of labor organizations. The annual estimates are extrapolated using QCEW wage data.

The benchmark and annual estimates of *political organization* expenditures are based on data on contributions for Federal elections from the Federal Election Commission, on independent expenditures for national office data from the Campaign Finance Institute, and on state and local election spending from the National Institute for Money in State Politics.

Current quarterly estimates

For most categories of NPISHs, the third current quarterly estimate is based on expenses and receipts data from the Census Bureau's Quarterly Services Survey. The second and advance estimates are based primarily on CES data on employment, hours, and earnings: for categories other than education, a wages and salaries indicator equal to total employment times average weekly hours times average hourly earnings is used; for education categories, CES total employment times the all-items CPI is used.

Quantity estimates

The estimates of the real gross output of NPISHs are prepared by deflation using input cost indexes. These indexes are weighted averages of indexes of compensation costs and indexes of the prices of purchased goods and services. The weights for the indexes are based on BEA's Benchmark Input-Output estimates. For compensation costs, the indexes are based on QCEW data on average wages by industry, except for the indexes for hospitals and nursing homes, which are based on the BLS Employment Cost Index. The indexes for the current quarterly estimates for all categories except education

are extrapolated using CES data on average hourly earnings; the indexes for education categories are extrapolated using the CPI for education services. For purchased materials and services, PPIs and CPIs are used for the associated expenses, and for expenses that cannot be associated with specific price indexes, the all-items less food and energy CPI is used.

CHAPTER 6: PRIVATE FIXED INVESTMENT

(Updated: December 2020)

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Private fixed investment (PFI) measures spending by private businesses, nonprofit institutions, and households on fixed assets in the U.S. economy. Fixed assets consist of structures, equipment, and intellectual property products that are used in the production of goods and services. PFI encompasses the creation of new productive assets, the improvement of existing assets, and the replacement of worn out or obsolete assets.

The PFI estimates serve as an indicator of the willingness of private businesses and nonprofit institutions to expand their production capacity and as an indicator of the demand for housing. Thus, movements in PFI serve as a barometer of confidence in, and support for, future economic growth.

PFI also provides comprehensive information on the composition of business fixed investment. Thus, for example, it can be used to assess the penetration of new technology. In addition, the investment estimates are the building blocks for BEA's estimates of capital stock, which are used in measuring rates of return on capital and in analyzing multifactor productivity.

The PFI estimates are an integral part of the U.S. national income and product accounts (NIPAs), a set of accounts that provides a logical and consistent framework for presenting statistics on U.S. economic activity (see "Chapter 2: Fundamental Concepts"). The PFI estimates are also a primary element of BEA's fixed assets and consumer durable goods accounts.[1]

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[1] For a description of the methodology for BEA's estimates of the stocks and depreciation of fixed assets and of the investment flows used to derive them, see U.S. Bureau of Economic Analysis, *Fixed Assets and Consumer Durable Goods in the United States 1925–97*, September 2003.

Definitions and Concepts

PFI is a measure of the additions to, and replacements of, the U.S. stock of private fixed assets. As noted in chapter 2, fixed assets are produced assets that are used repeatedly or continuously in the production process—that is, in the production of other goods (including other fixed assets) or of services—for more than 1 year.

Table 6.1 shows the types of transactions that are included in, and excluded from, PFI. The bulk of PFI consists of capital expenditures by private business—including expenditures on new structures, equipment, and intellectual property products; net transactions in used assets; and own-account production (production by a business for its own use) of structures, equipment, and intellectual property products.[2] PFI also includes capital expenditures by nonprofit institutions serving households, and it includes capital expenditures for the acquisition of new residential structures and for improvements to existing residential structures by households in their capacity as owner-occupants.[3] In the NIPAs, the construction of a new house (excluding the value of the unimproved land) is treated as an investment, the ownership of the house (regardless of whether the residence is owner- or tenant-occupied) is treated as a productive business enterprise, and a service is assumed to flow over its economic life from the house to the occupant.[4] However, as noted in chapter 2, purchases of durable goods by persons are treated as personal consumption expenditures rather than as capital expenditures.

[2] In the NIPAs, private business consists of all corporate and noncorporate businesses that are organized for profit, other entities that produce goods and services for sale at a price that is based on the costs of production, and certain other private entities that are treated as business in the NIPAs. These other entities include mutual financial institutions, private noninsured pension funds, cooperatives, nonprofit organizations that primarily serve business (that is, entities classified as nonprofit by the Internal Revenue Service in determining income tax liability), federal reserve banks, and federally sponsored credit agencies.
[3] Capital expenditures by government enterprises are included in gross investment by government.
[4] This treatment is consistent with that of the international *System of National Accounts* (SNA): "Households that own the dwellings they occupy are formally treated as owners of unincorporated enterprises that produce housing services consumed by those same households" (SNA 2008: 6.117). For more information on the NIPA treatment of household services, see "Chapter 12: Rental Income of Persons" of this handbook.

Table 6.1—Content of Private Fixed Investment

Category of expenditure	Comments
Investment in structures by private business	Includes construction of new nonresidential and residential buildings. Includes improvements (additions, alterations, and major structural replacements) to nonresidential and residential buildings. Includes certain types of equipment (such as plumbing and heating systems and elevators) that are considered an integral part of the structure. Includes nonbuilding construction (such as pipelines, railroad tracks, power lines and plants, and dams and levees). Includes mobile structures (such as office trailers at construction sites and temporary trailer classrooms) and manufactured homes. Includes petroleum and natural gas well drilling and exploration, including "dry holes." Includes digging and shoring of mines. Includes brokers' commissions on sales of new and existing nonresidential structures and includes brokers' commissions and other ownership transfer costs on sales of new and existing residential structures. Includes net purchases (purchases less sales) of existing structures from governments. Excludes maintenance and repair of nonresidential and residential buildings. Excludes demolition costs not related to the construction of new structures.
Investment in equipment by private business	Includes equipment with service lives of 1 year or more that are normally capitalized in business accounting records. Includes equipment (such as furniture and household equipment) that is purchased by landlords for rental to tenants. Includes dealers' margins on sales of used equipment. Includes net business purchases of used equipment from governments, persons, and foreign residents. Excludes certain types of equipment that are integral parts of structures and that are included in the value of structures. Excludes parts used in the repair and maintenance of equipment, such as semiconductors, civilian aircraft parts, motor vehicle parts, computer parts, etc.
Investment in software, in research and development (R&D), and in entertainment, literary, and artistic originals by private business	Includes expenditures on both software originals and on software copies that are used in production and that have a service life of at least a year. Includes net business purchases of used software from governments, persons, and foreign residents. Includes expenditures for the discovery or development of new products, of improvements to existing products, and of new or more efficient processes of production. Includes the return to capital on fixed assets used to produce own-account R&D and own-account software. Includes expenditures for the development and production of theatrical movies, long-lived television programs, books, music, and other artistic originals. Includes only entertainment originals used to produce copies for the public. Excludes expenditures for short-lived entertainment, such as newspapers, radio, sports, and reality television shows.
Investment in residential structures by owner occupants	Same as for private business.
Investment in structures and in equipment and software by nonprofit institutions serving households	Same as for private business.

Using business-tax-accounting practices for depreciable assets as a guide, all structures are capitalized in the NIPAs, and equipment commodities are capitalized if they meet all three of the following criteria:

- The commodity must have a useful life of more than 1 year,
- The commodity must not be an integral part of a structure or included in the value of that structure (for example, an elevator), and
- The commodity, if purchased by a business, would be charged to a capital account under normal accounting procedures.

However, there are certain cases for which the NIPA treatment differs from that used in business-tax-accounting. For example, the exploration and drilling costs associated with unsuccessful drilling activities ("dry" holes) are treated as expenses by the petroleum industry but as investment in the NIPAs. In addition, business-accounting practices may differ from one industry to another, from one period to another, or from one type of asset to another. For example, some businesses may expense the purchase of certain types of software, while others may capitalize it; for consistency, all software purchases are treated as investment in the NIPAs.

These capitalization rules and the selection of commodities that are treated as fixed assets are reviewed and updated as part of the preparation of BEA's benchmark input-output (I-O) accounts and of comprehensive updates of the NIPAs. As part of the 2013 comprehensive NIPA revision, BEA fully integrated the 2007 benchmark input-output accounts and introduced several substantial changes that expanded the definition of fixed assets. First, BEA began treating expenditures by business, government, and nonprofit institutions serving households on research and development as fixed investment.[5] Second, it began treating expenditures by business and nonprofit institutions serving households on entertainment, literary, and other artistic originals as fixed investment. These changes recognize that these intangible assets have ownership rights, are long-lasting, and are used in the production process. Investment in research and development and in entertainment originals, along with that in software (which has been treated as a fixed asset since the 1999 comprehensive NIPA revision), is shown in the NIPAs in the subcategory "intellectual property products" in nonresidential fixed investment.[6] Also as part of the 2013 comprehensive update, BEA expanded the ownership transfer costs of residential fixed assets to include all of the nonfinancial ownership transfer costs that are associated with the purchase of a residential asset (such as title insurance; title, abstract, and attorney fees; payments for state and local government documentary and stamp taxes; and payments for surveys and engineering services).[7] As part of the 2018 comprehensive update, BEA began including the value of the return to fixed capital (that is, capital services) into estimates of private fixed investment in own-account software and in own-account R&D beginning with 2007. The improved treatment is consistent with international standards and will provide more

[5] The treatment of these expenditures as investment provides another example in which economic accounting differs from business accounting; see Dylan G. Rassier, "BEA Briefing: Treatment of Research and Development in Economic Accounts and in Business Accounts," *Survey of Current Business* 94 (March 2014): 1–8.

[6] For more information, see "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts: Changes in Definitions and Presentations," *Survey* 93 (March 2013): 14–21.

[7] Expenses associated with financing a purchase of a residential asset, such as loan origination fees, credit reports, and adjustment and collection expenses, continue to be recorded as current expenses, because these expenses represent financial services and are not necessary to purchase a dwelling.

complete estimates of the opportunity costs of own-account investment, provide improved measures of the sources of economic growth and productivity, and contribute to the literature on measuring own-account investment and intangible assets.

The NIPA measure of PFI records capital expenditures on structures in the United States regardless of whether the structure is U.S.-owned or foreign-owned.[8] It records capital expenditures on equipment and software in the United States regardless of whether the equipment and software are domestically produced or imported. In contrast, capital expenditures by U.S. residents on structures in other countries and U.S. exports of equipment and software are excluded from the PFI measure.

In the NIPAs, the broadest measure of PFI is *gross private fixed investment*. It is measured without deduction of consumption of fixed capital (CFC), which is a measure of capital used up in production. Gross private fixed investment less CFC equals *net private fixed investment*. Gross private fixed investment comprises *nonresidential fixed investment* in structures, equipment, and intellectual property products and *residential fixed investment* in structures and equipment.

Nonresidential structures consists of new construction—including own-account construction;[9] improvements to existing structures;[10] expenditures on new mobile structures; expenditures on mining exploration, shafts, and wells;[11] brokers' commissions on sales of structures;[12] and net purchases of used structures by private businesses and by nonprofit institutions from government agencies.[13] In addition, it includes equipment that is considered to be an integral part of the structure (such as plumbing, heating, and electrical systems).

Nonresidential equipment consists of purchases by private businesses and by nonprofit institutions of new equipment (such as machinery, furniture, and motor vehicles) that meets the above definition of a fixed asset. It also includes dealers' margins on sales of used equipment to businesses and to nonprofit institutions; net purchases of used equipment from government agencies, from persons, and from the rest of the world; and own-account production of equipment. It is measured net of the value of worn out equipment sold for scrap.

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[8] Ownership of a structure in a country signifies a long-term economic interest in that country, and thus the owner is considered a resident of that country.

[9] For nonresidential fixed investment, own-account construction consists of the value of construction materials supplied by the project owner and the value of the labor supplied by the owner's own construction employees assigned to the project.

[10] Improvements to nonresidential structures are included with new construction but are not separately identified.

[11] In principle, mining exploration should be classified as part of intellectual property products, but currently these expenditures cannot be separately identified due to source data limitations.

[12] These commissions are considered part of the total price paid by the purchaser for the structure and thus are counted as part of the value of investment.

[13] These transactions are included so that private and government ownership of the net stock of fixed assets is properly recorded; by definition, such transfers net to zero and do not affect gross domestic product.

Nonresidential intellectual property products consists of purchases and own-account production of software, of research and development (R&D), and of entertainment, literary, and artistic originals. R&D includes depreciation on fixed assets used to produce R&D. Entertainment originals includes theatrical movies, long-lived television programs, books, music, and other artistic originals that are used to produce copies for the public.

Residential structures consists of new construction of permanent-site single-family and multifamily housing units, improvements (additions, alterations, and major structural replacements) to housing units,[14] expenditures on manufactured homes, brokers' commissions and other ownership transfer costs[15] on the sale of residential property, and net purchases of used structures from government agencies. Residential structures also includes some types of equipment (such as heating and air conditioning equipment) that are built into the structure.

Residential equipment consists of equipment, such as furniture or household appliances, that is purchased by landlords for rental to tenants.

Recording in the NIPAs

As described in chapter 2, the NIPAs can be viewed as aggregations of accounts belonging to individual transactors in the economy. PFI represents the final demand for structures, for equipment, and for intellectual property products by private businesses and by other entities that are treated similarly to businesses in the NIPAs. In the seven summary accounts of the NIPAs, PFI appears in the Domestic Income and Product Account (account 1) as the dominant component of gross private domestic investment and in the Domestic Capital Account (account 6) as the dominant component of gross domestic investment.

In the NIPAs, PFI is shown by type of product classification rather than by industry classification. Annual estimates of gross fixed investment and net fixed investment (that is, investment less CFC) by major type are provided in NIPA table group 5.2. PFI by type is presented in NIPA table group 5.3. PFI in structures by type is shown

[14] Improvements to residential structures—which, unlike those to nonresidential structures, are shown separately in the NIPAs—consist of additions, alterations, and major replacements to structures subsequent to their completion. They include construction of additional housing units in existing residential structures, finishing of basements and attics, remodeling of kitchens and bathrooms, and the addition of swimming pools and garages. They include major replacements—such as new roofs, water heaters, furnaces, and central air conditioners—that prolong the expected life of the structure or add to its value; routine maintenance and repair work is not included. For residential fixed investment, own-account construction ("do-it-yourself" projects) consists of the value of the materials supplied only and does not include the value of the labor supplied by the property owner.

[15] Ownership transfer costs includes title insurance; title, abstract, and attorney fees; payments for state and local government documentary and stamp taxes; and payments for surveys and engineering services. They do not include current expenses associated with financing a purchase of a residential asset, such as loan origination fees, credit reports, and adjustment and collection expenses,

in table group 5.4, PFI in equipment by type is shown in table group 5.5, and PFI in intellectual property products by type is shown in table group 5.6.

The following is a list of the principal NIPA tables that present the PFI estimates:

5.2.3 Real Gross and Net Domestic Investment by Major Type, Quantity Indexes
5.2.5 Gross and Net Domestic Investment by Major Type
5.2.6 Real Gross and Net Domestic Investment by Major Type, Chained Dollars
5.3.1 Percent Change From Preceding Period in Real Private Fixed Investment by Type
5.3.2 Contributions to Percent Change in Real Private Fixed Investment by Type
5.3.3 Real Private Fixed Investment by Type, Quantity Indexes
5.3.4 Price Indexes for Private Fixed Investment by Type
5.3.5 Private Fixed Investment by Type
5.3.6 Real Private Fixed Investment by Type, Chained Dollars
5.4.1 Percent Change From Preceding Period in Real Private Fixed Investment in Structures by Type
5.4.2 Contributions to Percent Change in Real Private Fixed Investment in Structures by Type
5.4.3 Real Private Fixed Investment in Structures by Type, Quantity Indexes
5.4.4 Price Indexes for Private Fixed Investment in Structures by Type
5.4.5 Private Fixed Investment in Structures by Type
5.4.6 Real Private Fixed Investment in Structures by Type, Chained Dollars
5.5.1 Percent Change From Preceding Period in Real Private Fixed Investment in Equipment by Type
5.5.2 Contributions to Percent Change in Real Private Fixed Investment in Equipment by Type
5.5.3 Real Private Fixed Investment in Equipment by Type, Quantity Indexes
5.5.4 Price Indexes for Private Fixed Investment in Equipment by Type
5.5.5 Private Fixed Investment in Equipment by Type
5.5.6 Real Private Fixed Investment in Equipment by Type, Chained Dollars
5.6.1 Percent Change From Preceding Period in Real Private Fixed Investment in Intellectual Property Products
5.6.2 Contributions to Percent Change in Real Private Fixed Investment in Intellectual Property Products
5.6.3 Real Private Fixed Investment in Intellectual Property Products, Quantity Indexes
5.6.4 Price Indexes for Private Fixed Investment in Intellectual Property Products
5.6.5 Private Fixed Investment in Intellectual Property Products
5.6.6 Real Private Fixed Investment in Intellectual Property Products, Chained Dollars

BEA also prepares estimates of private fixed investment that are not seasonally adjusted; these are available in Section 8 of the NIPA Interactive Data Tables. The tables present nominal, or "current-dollar" measures, "real," or inflation-adjusted measures, and price indexes.

Additionally, BEA prepares "Underlying Detail" tables for PFI that provide current-dollar, chained-dollar, and price estimates at a greater level of detail than are shown in the above tables. BEA does not include these detailed estimates in the published tables

because their quality is significantly less than that of the higher level categories of which they are a part. In particular, the detailed estimates are more likely to be based on judgmental trends, on trends in the higher level category, or on less reliable source data. The underlying detail tables for PFI consist of tables that provide quarterly estimates that are in the same format as, and consistent with, the annual estimates shown in NIPA table groups 5.2, 5.4, 5.5, and for the software estimates shown in table 5.6.[16] Because of data limitations, BEA does not publish underlying detail for the other intellectual property products.

In addition, estimates of PFI by industry and by legal form of organization are presented as part of BEA's fixed assets and consumer durable goods accounts.[17]

Overview of Source Data and Estimating Methods

As described earlier, the NIPA estimates, including those for PFI, are prepared using a wide variety of source data (see "Chapter 3: Principal Source Data") and using estimating methods that adjust the source data to the required NIPA concepts and that fill in gaps in coverage and timing (see "Chapter 4: Estimating Methods"). For PFI, the estimates are based on government statistical reports, primarily from the U.S. Census Bureau but also from other federal government agencies, and on reports from private organizations, such as trade associations. The following are among the principal source data used for the PFI estimates: BEA's benchmark I-O accounts, which are primarily based on the Census Bureau's Economic Censuses, and BEA's International Transactions Accounts; the Census Bureau's annual and monthly Survey of Manufacturers, monthly construction statistics, monthly foreign trade data, the Service Annual Survey, and the Quarterly Services Survey; the Bureau of Labor Statistics' (BLS) monthly Current Employment Statistics, Producer Price Indexes (PPIs) and Import Price Indexes; and National Science Foundation's (NSF) surveys of research and development and innovation.

Table 6.A (investment in structures), table 6.B (investment in equipment), and table 6.C (investment in intellectual property products) at the end of this chapter summarize the source data and estimating methods that are used to prepare the current-dollar benchmark, nonbenchmark, and current quarterly estimates and the quantity and price indexes for the detailed categories shown by type in NIPA table groups 5.4, 5.5, and 5.6. The source data and methods for the current quarterly estimates reflect both seasonally adjusted and not seasonally adjusted estimates unless otherwise noted.

[16] See "Access Underlying Detail Tables" in BEA's "Interactive Data," at www.bea.gov.
[17] See "Fixed Assets" on BEA's website at www.bea.gov.

Benchmark-year estimates

For benchmark years, BEA's benchmark I-O accounts are used to establish the levels of PFI and its components. The I-O accounts show the domestic output of each commodity and its disposition—either as intermediate consumption by industries or as purchases for final use, including business investment. In the I-O accounts, PFI is presented as the sum of detailed commodities purchased by business for final use.[18] These commodities are then grouped into the PFI categories shown in the NIPA tables.[19]

For structures, the benchmark I-O estimates are primarily based on detailed value-put-in-place data from the Census Bureau's monthly survey of construction spending. The "value of construction put in place" is defined as the value of construction installed or erected at the construction site during a given period, regardless of when the work on the project was started or completed, when the structure was sold or delivered, or when payment for the structure was made.[20] BEA adjusts the value-put-in-place data to account for coverage gaps that are implied by comparing these data with those from the Census Bureau's Economic Census.[21] In addition, BEA uses data from other government sources and from trade sources in estimating the following structures categories: mobile structures; oil and natural gas well drilling and exploration; other mining exploration, shafts, and wells; residential manufactured homes; brokers' commissions on the sale of nonresidential structures and brokers' commissions and other ownership transfer costs on the sale of residential structures; and net purchases of used structures from government agencies.

For equipment, the benchmark estimates are largely prepared using the commodity-flow method (for a general description of this method, see "Commodity-flow method" in chapter 4). This method, which is implemented in its most complete form in preparing the benchmark I-O accounts, generally begins with a value of domestic output (principally manufacturers' shipments) based on detailed data from the Economic Censuses. Next, the domestic supply of each commodity—the amount available for domestic consumption—is estimated by adding imports and subtracting exports, both based on the Census Bureau's international trade data. The domestic supply is then allocated among domestic purchasers—business, government, and consumers. For most commodities, the allocation of purchases to business, and the subsequent allocation of

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[18] For more information on the preparation of the I-O benchmark accounts, see U.S. Bureau of Economic Analysis, *Concepts and Methods of the U.S. Input-Output Accounts*, April 2009, available on BEA's website at www.bea.gov.

[19] A complete listing of the commodities underlying each category of PFI in equipment is available as part of an FAQ available on BEA's website: "Are more detailed estimates available for investment in private equipment beyond what is presented in the underlying detail Table 5.5.5U?" (see the section on "PEQ Bridge").

[20] Value put in place is measured as the sum of the cost of materials installed or erected; cost of labor supplied by contractors and by project owners; and a proportionate share of the cost of construction equipment rental, contractors' profit, cost of architectural and engineering work, miscellaneous overhead and office costs chargeable to the project on the owners' books, and interest and taxes paid during construction.

[21] These adjustments are for own-account construction, for small projects that are excluded from the value-put-in-place data, and for nonresidential improvements.

those purchases between intermediate and final use, is based on Economic Census data. In a few cases, the allocation is entirely to final use (for example, motor vehicles) or to intermediate use (for example, semiconductors).[22] The commodity-flow calculations also include estimates of trade margins and transportation costs[23] and estimates of transactions in used equipment (see the technical note at the end of this chapter). The following estimates are prepared directly rather than by commodity flow: installation costs for communication equipment, industrial process design costs, and expenditures for nuclear fuel rods, and for scrap metal.

For intellectual property products, the benchmark-year estimates for purchased software are based on industry receipts data from the Census Bureau's Economic Census. The estimates for own-account software are measured as the sum of production costs, including the value of capital services (which includes depreciation). The estimates are based on BLS data on occupational employment and wages, on Economic Census data, and on BEA-derived measures of capital services.[24]The benchmark-year estimates for R&D are based on NSF survey data, and the estimates for entertainment originals are based on revenue data from the Economic Census. (For more information on the estimates for intellectual property products, see the technical note at the end of this chapter.)

Nonbenchmark-year estimates

The estimates of structures for nonbenchmark years are generally prepared at the same level of detail as those for benchmark years. For most components, the estimates are prepared by using the monthly construction spending data as an indicator series to extrapolate the benchmark-year estimates (see "Interpolation and extrapolation using an indicator series" in chapter 4) and by assuming that the relationships underlying the benchmark estimates remain unchanged. For example, the coverage adjustments made to the construction spending data for the benchmark year are assumed to be a constant proportion for periods after the benchmark year until the next benchmark estimates are available.

The estimates of equipment for nonbenchmark years are generally prepared at a more aggregate level of detail than those for benchmark years, primarily because data on shipments are not available for the detailed product groupings. For most components, the estimates are prepared using an abbreviated form of the commodity-flow method that accommodates the available source data. For years except the most recent year, the primary source for domestic manufacturers' shipments is the Census Bureau's Annual Survey of Manufactures (ASM), which collects data by product class; for the most recent

[22] For a description of the methodology used to prepare the estimates for new motor vehicles, see the technical note in "Chapter 5: Personal Consumption Expenditures" in this handbook.
[23] Trade margins measure the cost of marketing goods from producers to final purchasers, including markups by wholesalers and retailers. Transportation costs measure the costs of carrying goods by rail, truck, water, air, and liquid and gas pipelines.
[24] For more information, see Jason W. Chute, Stephanie H. McCulla, and Shelly Smith, "Preview of the 2018 Comprehensive Revision of the National Income and Product Accounts," Survey 98 (April 2018): 13.

year, the primary source for shipments is the Census Bureau's monthly Survey of Manufacturers' Shipments, Inventories, and Orders, which collects data by industry group. For most components, estimates of exports and imports (based on international trade data), government purchases (based on Federal agency administrative data and on Census Bureau surveys of state and local government finance), and inventories (based on Census Bureau surveys and on IRS tabulations of business tax returns) are available. The estimates of the distributions of purchases among consumers, business final use, and business intermediate purchases are largely based on the benchmark relationships.

For intellectual property products, the nonbenchmark-year estimates for purchased software are based on receipts data from the Census Bureau's Service Annual Survey (SAS), and the estimates of own-account software are primarily based on BLS data on employment and wages. The nonbenchmark-year estimates for R&D are based on NSF survey data and SAS receipts data, and the estimates for entertainment originals are primarily based on SAS revenue data. (For more information on the estimates for intellectual property products, see the technical note at the end of this chapter.)

Current quarterly estimates

The seasonally adjusted current-dollar quarterly estimates—that is, the estimates for the quarters that have not yet been subject to an annual update—for most categories of structures are prepared by extrapolation, using the same data sources as those used for the nonbenchmark-year estimates. For net purchases of used structures, the current quarterly estimates are based on judgmental trends. For petroleum and natural gas exploration and drilling, the quantity estimates for the current quarter are prepared first by extrapolating the quantity annual series using indicator series; these estimates are then converted (reflated) to current-dollar values using quarterly price indexes.

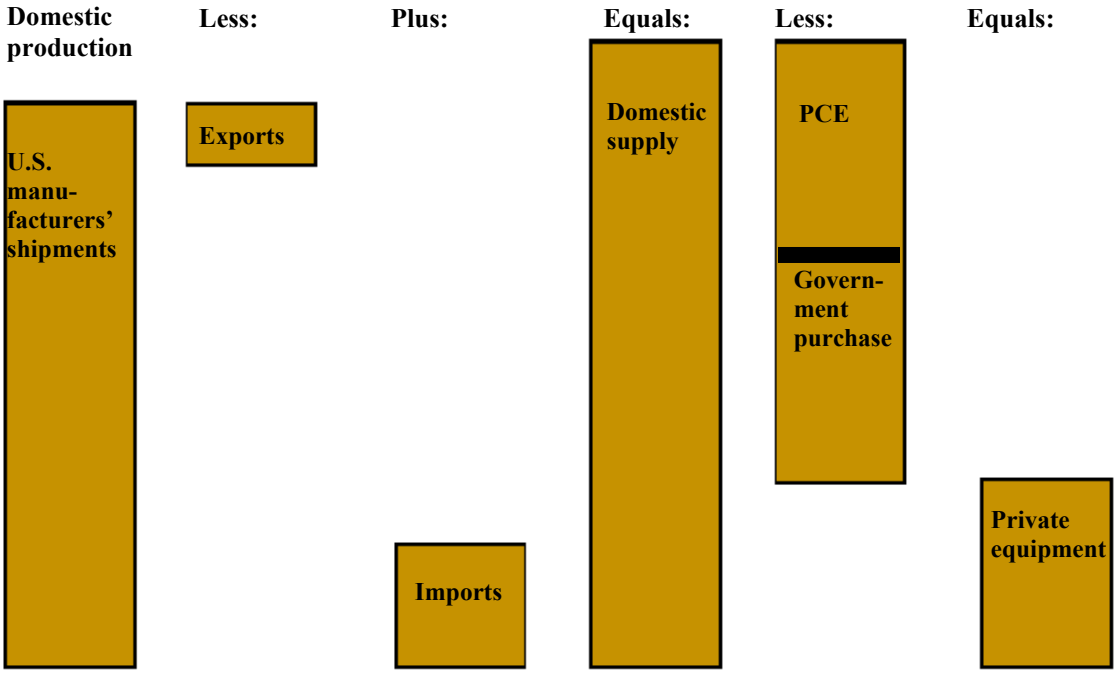
The current quarterly estimates for equipment are prepared by the abbreviated commodity-flow method at the same aggregated level and based on the same data source as that used for the most-recent-year estimates (chart 6.1).

For intellectual property products, the current quarterly estimates for purchased software are based on receipts data from the Census Bureau's Quarterly Services (QSS) when available; when they are not available, the estimates are judgmentally trended by BEA. Estimates of own-account software are based on BLS current employment statistics. The current quarterly estimates for R&D are based on company reports and receipts data from the QSS when available; when unavailable, estimates are judgmentally trended by BEA. The estimates for entertainment originals are based on QSS revenue data when available and are otherwise judgmentally trended by BEA.[25] (For more information on the estimates for intellectual property products, see the technical note at the end of this chapter.)

[25] Because of data limitations, BEA does not publish current quarterly estimates for individual research and development and entertainment-original components.

The not seasonally adjusted estimates are derived using the same methods as the seasonally adjusted estimates, using the not seasonally adjusted versions of the same indicators.

Chart 6.1—Abbreviated Commodity-Flow Method



The abbreviated procedure for preparing the current quarterly estimate for a typical equipment component may be summarized as follows:

1. Manufacturers' industry shipments are taken from the monthly Survey of Manufacturers' Shipments, Inventories, and Orders.
2. The shipments by industry are converted to private equipment shipments by product, using information on the relationship between industry shipments and product shipments from the most recent year's ASM.
3. Exports are subtracted from and imports are added to the product shipments, yielding an estimate of domestic supply. The data on exports and imports are from the Census Bureau.
4. No attempt is made to estimate the effects of quarterly inventory changes on the commodity flow for any commodities.
5. Business intermediate purchases are subtracted from domestic supply, primarily based on ratios derived from the detailed benchmark I-O estimates, and consumer purchases and government purchases are subtracted, primarily based on information from the most recent annual estimates.
6. Trade and transportation margins, based on detailed benchmark I-O estimates, are added in order to convert domestic supply in producers' prices to PFI in purchasers' prices.
7. The resulting estimate is used to extrapolate the most recent annual estimate.

Quantity and price estimates

The estimates of quantities purchased, or real spending, for most of the detailed PFI categories are prepared by deflation. Under this method, the quantities are calculated by dividing the current-dollar value of the component by an "appropriate" price index (with the reference year set equal to 100). For petroleum and natural gas exploration and drilling, the quantity estimates are prepared by direct valuation (see the technical note). (For a general description of these methods, see "Estimates for detailed components" in chapter 4.)

For structures, a wide variety of price indexes from public and private sources are used as deflators. For some components of nonresidential structures, quality-adjusted output price measures, such as PPIs, are not available, and BEA uses combinations of input-cost measures and output-cost measures in an effort to capture productivity and quality changes.[26] For most equipment categories, detailed PPIs and import price indexes from BLS are used. For intellectual property products, a variety of price indexes are used (for more information, see the technical note at the end of this chapter).

The aggregate PFI measures are calculated from the detailed components as chain-type quantity and price indexes (for information about these calculations, see "Estimates for NIPA aggregates" in chapter 4). BEA also prepares measures of real PFI and its components in a dollar-denominated form, designated "chained-dollar" estimates (see "Chained-dollar measures" in chapter 4).[27]

[26] For more information, see Paul R. Lally, "BEA Briefing: How BEA Accounts for Investment in Private Structures," *Survey* 89 (February 2009): 11.

[27] BEA does not provide chained-dollar measures (as distinct from chain-weighted indexes and percent changes) for computers, which are affected by highly volatile changes in prices and quantities (see J. Steven Landefeld, Brent R. Moulton, and Cindy M. Vojtech, "Chained-Dollar Indexes: Issues, Tips on Their Use, and Upcoming Changes," *Survey* 83 (November 2003): 16.

Table 6.A—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Structures

Line in NIPA table group 5.4	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
2	**Nonresidential:**					
3	Commercial and health care:					
4	Office[1]	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	PPI for office building construction.
5–9	Health care	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	PPI for healthcare building construction.
10	Multimerchandise shopping	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	PPI for warehouses.
11	Food and beverage establishments	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	PPI for warehouses.
12	Warehouses	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	PPI for warehouses.
13	Other commercial[2]	Mobile structures: commodity-flow method, starting with manufacturers' shipments from EC. Other components: BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Mobile structures: shipments from Manufactured Housing Institute times average retail price from Census Bureau monthly Manufactured Housing Survey. Other components: Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	Mobile structures: PPI for mobile structures. Other components: PPI for warehouses.

Table 6.A—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Structures

Line in NIPA table group 5.4	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
14	Manufacturing	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	PPI for industrial buildings.
15	Power and communication:					
16	Power:					
17	Electric	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	For annual, weighted average of Handy-Whitman construction cost indexes for electric light and power plants and for utility building; for quarterly, three-quarter moving average of Bureau of Reclamation composite index of construction costs.
18	Other power	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	For annual, Handy-Whitman gas index of public utility construction costs; for quarterly, unweighted average of three-quarter moving average of Bureau of Reclamation composite index of construction costs and of PPI for steel pipe and tubes.
19	Communication	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	For annual, AUS telephone plant cost index; for quarterly, *Engineering News Record* construction cost index.
20	Mining exploration, shafts, and wells:					
21	Petroleum and natural gas	BEA's benchmark I-O accounts, primarily based on expenditures data from EC.	Based on footage drilled completions from American Petroleum Institute (API) times weighted average of PPI for oil and gas wells, PPI for oil and gas field services, and base-year cost of footage drilled that is based	Same as for nonbenchmark years.	Based on weighted average of footage drilled completions from API and of rotary rig counts from Baker Hughes, reflated using weighted average of PPI for oil and gas wells and of	For annual, direct valuation method using footage drilled completions from API; for quarterly, extrapolated using weighted average of API footage drilled completions and of Baker Hughes rotary rig counts. Quarterly price index extrapolated using weighted average of PPI for oils and gas wells and of PPI for oil and gas field services.

Table 6.A—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Structures

Line in NIPA table group 5.4	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
			on Census Bureau Annual Capital Expenditures Survey data on new structures for oil and gas extraction industries and on API footage drilled completions.		PPI for oil and gas field services.	
22	Mining	BEA's benchmark I-O accounts, primarily based on expenditures data from EC.	Expenditures from Census Bureau Annual Capital Expenditures Survey.	BEA data on private investment in mining equipment.	Same as for most recent year.	Unweighted average of Census Bureau price index for new one-family houses under construction and of Turner Construction Co. building-cost index.
23	Other structures:					
24	Religious	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	Unweighted average of Census Bureau price index for new one-family houses under construction and of Turner Construction Co. building-cost index.
25	Educational and vocational	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	PPI for new school construction.
26	Lodging	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	Unweighted average of Census Bureau price index for new one-family houses under construction and of Turner Construction Co. building-cost index.
27	Amusement and recreation	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	Unweighted average of Census Bureau price index for new one-family houses under construction and of Turner Construction Co. building-cost index.
28	Transportation:					
29	Air transportation	BEA's benchmark I-O accounts, primarily	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	Unweighted average of Census Bureau price index for new one-family houses under

Table 6.A—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Structures

Line in NIPA table group 5.4	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
		based on value put in place from MCS.				construction and of Turner Construction Co. building-cost index.
30	Land transportation.[3]	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	Railroad: weighted average of BLS employment cost index for the construction industry, of Bureau of Reclamation construction cost trends for bridges and for power plants, of PPI for material and supply inputs to construction industries, and of PPI for communications equipment. Other components: unweighted average of Census Bureau price index for new one-family houses under construction and of Turner Construction Co. building-cost index.
31	Farm	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	Unweighted average of Census Bureau price index for new one-family houses under construction and of Turner Construction Co. building-cost index.
32	Other.[4]	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Value put in place from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	Highways: Federal Highway Administration composite index for highway construction costs. Water: for annual, Handy-Whitman water index of public utility construction costs; for quarterly, Bureau of Reclamation composite index of construction costs. Other components: unweighted average of Census Bureau price index for new one-family houses under construction and of Turner Construction Co. building-cost index.
33	Brokers' commissions on sale of structures	BEA's benchmark I-O accounts, primarily based on revenue data from EC.	Value put in place for new nonresidential buildings from MCS.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	PPI for real estate brokerage, nonresidential property sales and rental.

Table 6.A—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Structures

Line in NIPA table group 5.4	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
34	Net purchases of used structures	BEA's benchmark I-O accounts, based on data from federal government agencies, primarily Government Services Administration, and from COG.	Data from GF and from federal government sources.	Data from federal government agencies and judgmental trend.	Judgmental trend.	Unweighted average of BEA implicit price deflators for nonresidential buildings, for utilities, for farm buildings, and for other private structures.
35	**Residential:**					
36	Permanent site:					
37	Single-family structures [For more detail, see "Technical Note: Special Estimates."]	Value put in place, based on phased pattern of housing starts and average construction costs, from MCS.	Same as for benchmark year.	Same as for benchmark year.	Same as for benchmark year.	Census Bureau price index for new one-family houses under construction.
38	Multifamily structures	Value put in place from MCS.	Same as for benchmark year.	Same as for benchmark year.	Same as for benchmark year.	Census Bureau price index for new multi-family houses under construction.
39	Other structures:					
40	Manufactured homes	Commodity-flow method, starting with manufacturers' shipments from EC.	Shipments from Manufactured Housing Institute times average retail price from Census Bureau monthly manufactured homes survey.	Same as for nonbenchmark years.	Same as for nonbenchmark years.	PPI for mobile structures.
41	Dormitories	Value put in place from MCS.	Same as for benchmark year.	Same as for benchmark year.	Same as for benchmark year.	Census Bureau price index for new one-family houses under construction.
42	Improvements	BEA's benchmark I-O accounts, primarily based on value put in place from MCS.	Census Bureau Annual Retail Trade Survey data on building supply retail sales and BLS	Same as for nonbenchmark years.	Same as for benchmark year.	Unweighted average of Census Bureau price index for new one-family houses under construction, of PPI for home maintenance and repair construction, and of BLS employment cost index for the construction industry.

Table 6.A—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Structures

Line in NIPA table group 5.4	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
			remodelers' payroll data.			
43	Brokers' commissions and other ownership transfer costs.[5]	BEA's benchmark I-O accounts, primarily based on revenue data from EC.	Brokers' commissions and other ownership transfer costs except stamp taxes and title insurance: number of one-family houses sold times mean sales price, from Census Bureau data on new home sales and from National Assn. of Realtors data on existing home sales, times BEA estimate of average commission rate for sale of new homes and for sale of existing homes. Stamp taxes: state and local government annual document stamp taxes from Census Bureau annual survey of government finances. Title insurance: data on operating revenue and on loss-adjusted expenses from American Land and Title Assn.	Same as for nonbenchmark year.	Number of one-family houses sold times mean sales price, from Census Bureau data on new home sales and from National Assn. of Realtors data on existing home sales, times BEA estimate of average commission rate for sale of new homes and for sale of existing homes.	PPI for real estate brokerage, residential property sales and rental. .

Table 6.A—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Structures

Line in NIPA table group 5.4	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
44	Net purchases of used structures	BEA's benchmark I-O accounts, based on data from federal government agencies, primarily Federal Housing Administration, and from COG.	Data from GF and from federal government agencies.	Data from federal government agencies and judgmental trend.	Judgmental trend.	Census Bureau price index for new one-family houses under construction.

*The description "Same as for benchmark year" indicates that the estimate is prepared using a methodology similar to that used for the benchmark estimate rather than by using an indicator series to interpolate or extrapolate the benchmark estimate.

ASM Annual Survey of Manufactures, Census Bureau
BEA Bureau of Economic Analysis
BLS Bureau of Labor Statistics
COG Census of Governments, Census Bureau
CPI Consumer Price Index, BLS
EC Economic Census, Census Bureau
GF Annual survey of government finances, Census Bureau
I-O Input-Output accounts, BEA
MCS Monthly construction spending, Census Bureau
PPI Producer Price Index, BLS

[1] Consists of office buildings, except those constructed at manufacturing sites and those constructed by power utilities for their own use. Includes all financial buildings.
[2] Includes buildings and structures used by the retail, wholesale, and selected service industries. Consists of auto dealerships, garages, service stations, drug stores, restaurants, mobile structures, and other structures used for commercial purposes. Bus or truck garages are included in transportation.
[3] Consists primarily of railroads.
[4] Includes water supply, sewage and waste disposal, public safety, highway and street, and conservation and development.
[5] Consists of brokers' commissions on the sale of residential structures and adjoining land, title insurance, state and local documentary stamp taxes, attorney fees, title abstract and escrow fees, and fees for surveys and engineering services.

Table 6.B—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Equipment

Line in NIPA table group 5.5	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
2	**Nonresidential equipment:**					
3	Information processing equipment:					
4	Computers and peripheral equipment	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments based on Federal Reserve Board industrial production index and on MSM.	Same as for most recent year.	PPI for host computers, multiusers, PPI for portable computers, laptops, PDAs, and other single user computers, PPI for personal computers and workstations (except portable computers), PPI for computer storage devices, PPI for computer terminals, and PPI for other computer peripheral equipment; IPI for computers, IPI for computer storage devices, IPI for computer displays, including monitors and terminals, and IPI for computer printers.
5	Communications equipment	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	For annual, Federal Reserve Board (FRB) price indexes for data networking equipment, voice network equipment, data transport equipment, and a weighted composite of wireless networking equipment and BLS CPI for smartphones; PPI for telephone apparatus, PPI for communications equipment, PPI for broadcast, studio, and related electronic equipment, PPI for search, detection, navigation, and guidance systems and equipment, and PPI for engineering services; IPI for telecommunications equipment and IPI for scientific and medical machinery. For current quarter, same as for annual except PPI for communication equipment manufacturing price index in place of FRB price indexes.
6	Medical equipment and instruments	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers'	Same as for most recent year.	BEA price indexes for medical imaging equipment and for electronic medical equipment; PPI for surgical and medical instruments, PPI for dental equipment and supplies, PPI for irradiation apparatus, PPI for electromedical apparatus, and

Table 6.B—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Equipment

Line in NIPA table group 5.5	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
				shipments from MSM.		PPI for engineering services; IPI for scientific and medical machinery.
7	Nonmedical instruments	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for irradiation apparatus, PPI for laboratory apparatus and furniture, PPI for industrial process variable instruments, PPI for integrating and totalizing meters for gas and liquids, PPI for physical properties testing and inspection equipment and kinematic testing and measuring equipment, PPI for commercial, geophysical, meteorological, and general-purpose instruments and equipment, and PPI for engineering services; IPI for scientific and medical machinery and IPI for measuring, testing, and control instruments.
8	Photocopy and related equipment	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	BEA photocopy equipment price index, PPI for analytical laboratory instruments, PPI for optical instruments and lenses, and PPI for engineering services; IPI for recreational equipment and materials.
9	Office and accounting equipment	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for calculating and accounting machines, PPI for office machinery, and PPI for engineering services; IPI for business machinery and equipment, except computers.
10	Industrial equipment:					
11	Fabricated metal products	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with	Abbreviated commodity-flow method, starting with manufacturers'	Same as for most recent year.	Department of Energy reported prices of uranium and uranium enrichment services, PPI for metal shipping barrels, drums, kegs, and pails, PPI for fabricated plate work (boiler shops), PPI for power

Table 6.B—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Equipment

Line in NIPA table group 5.5	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
			manufacturers' shipments from ASM.	shipments from MSM.		boiler and heat exchanger, PPI for metal tank, heavy gauge, PPI for other metal valve and pipe fitting, PPI for fabricated pipe and pipe fitting, PPI for all other miscellaneous fabricated metal products, and PPI for engineering services; IPI for finished metals related to durable goods and IPI for taps, cocks, valves, and similar appliances.
12	Engines and turbines	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for turbine and turbine generator set units, PPI for gasoline engines, PPI for diesel, semi-diesel, and dual fuel engines (except automotive), PPI for other engine equipment manufacturing, and PPI for engineering services; IPI for generators, transformers, and accessories and IPI for spark-ignition internal combustion piston engines.
13	Metalworking machinery	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for metal cutting machine tools, PPI for metal grinding, polishing, buffing, honing, and lapping machines, PPI for other metal cutting machine tools, PPI for parts for metal cutting machine tools (sold separately) and rebuilt machine tools, PPI for metal forming machine tools, PPI for metal punching and shearing (power and manual), and bending and forming machines (power only), PPI for metalworking presses (except forging and die-stamping presses), PPI for special tool, die, jig, and fixture, PPI for rolling mill machinery and equipment, PPI for assembly machines, and PPI for engineering services; IPI for metal working machine tools and rolling mills.
14	Special industry machinery, n.e.c.	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers'	Same as for most recent year.	PPI for food product machinery, PPI for textile machinery, PPI for sawmill and woodworking machinery, PPI for paper industries machinery, PPI for printing machinery and equipment, PPI for chemical manufacturing machinery, equipment, and

Table 6.B—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Equipment

Line in NIPA table group 5.5	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
				shipments from MSM.		parts, PPI for plastics working machinery and equipment, PPI for rubber working machinery and equipment, PPI for semiconductor machinery and parts, and PPI for engineering services; IPI for other industrial machines and IPI for industrial and service machinery.
15	General industrial, including materials handling, equipment	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for conveyor and conveying equipment, PPI for industrial truck, trailer, and stacker, PPI for power-driven handtools, PPI for packing, packaging, and bottling machinery, PPI for pump and pumping equipment, PPI for air and gas compressors and vacuum pumps, PPI for industrial spraying equipment, PPI for industrial and commercial fan and blower, PPI for air purification equipment, PPI for industrial process furnaces and ovens and industrial electrical heating equipment, PPI for scale and balance, except laboratory, equipment, PPI for welding and soldering equipment, and PPI for engineering services; IPI for oil drilling, mining, and construction machinery, IPI for metal working machine tools and rolling mills, and IPI for industrial and service machinery.
16	Electrical transmission, distribution, and industrial apparatus	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for electrical measuring and integrating instruments, PPI for electric power and specialty transformer, PPI for switchgear and switchboard apparatus, PPI for motors and generators, PPI for relay and industrial control equipment, PPI for semiconductor power conversion apparatus, and PPI for engineering services; IPI for nonelectrical machinery, IPI for electric generating equipment, and IPI for electric apparatus and parts, n.e.c.
17	Transportation equipment:					
18	Trucks, buses, and truck trailers:					

Table 6.B—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Equipment

Line in NIPA table group 5.5	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
19	Light trucks (including utility vehicles).[1] [For more detail, see the technical note to "Chapter 5: Personal Consumption Expenditures."]	Based on unit sales from *Wards' Automotive Reports* and registration data from R.L. Polk & Co. times average sales price from J.D. Power and Assoc.	Same as for benchmark year.	Same as for benchmark year.	Same as for benchmark year.	CPI for new trucks.
20	Other trucks, buses, and truck trailers[1]	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Heavy trucks: unit sales from *Wards' Automotive Reports* times average sales price based on PPI for trucks, over 14,000 lbs. gross vehicle weight. Truck trailers: shipments from Americas Commercial Transportation Research Co.	Same as for most recent year.	PPI for trucks, over 14,000 lbs. gross vehicle weight, PPI for truck, bus, car, and other vehicle bodies, for sale separately, PPI for truck trailers and chassis, with axle rating of 10,000 lbs. or more, PPI for truck trailers and chassis, with axle rating of less than 10,000 lbs., and PPI for engineering services; IPI for automotive vehicles, parts, and engines.
21	Autos[1] [For more detail, see the technical note to "Chapter 5: Personal Consumption Expenditures."]	Based on unit sales from *Wards' Automotive Reports* and registration data from R.L. Polk & Co. times average sales price from J.D. Power and Assoc.	Same as for benchmark year.	Same as for benchmark year.	Same as for benchmark year.	CPI for new autos.

Table 6.B—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Equipment

Line in NIPA table group 5.5	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
22	Aircraft	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for civilian aircraft, PPI for aircraft engines and engine parts, and PPI for aeronautical, nautical, and navigational instruments.
23	Ships and boats	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for ship building and repairing, PPI for boat building, PPI for outboard motorboats, including commercial and military, and PPI for inboard motorboats, including commercial and military.
24	Railroad equipment	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for railroad rolling stock, PPI for locomotives and locomotive parts, PPI for passenger and freight train cars, and PPI for engineering services.
25	Other equipment:					
26	Furniture and fixtures	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for nonupholstered wood household furniture, PPI for upholstered household furniture, PPI for metal household furniture, PPI for mattresses, PPI for wood office furniture, PPI for institutional furniture, PPI for showcases, partitions, shelving, and lockers, PPI for window shades and window shade accessories, and PPI for engineering services; IPI for furniture, household items.
27	Agricultural machinery	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers'	Same as for most recent year.	PPI for farm machinery and equipment, PPI for farm-type (power take-off hp) wheel tractors, PPI for agricultural equipment, and PPI for engineering services; IPI for agricultural machinery and equipment.

Table 6.B—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Equipment

Line in NIPA table group 5.5	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
				shipments from MSM.		
28	Construction machinery	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for construction machinery, PPI for mixers, pavers, and related equipment, PPI for tractor shovel loaders, PPI for graders, rollers, compactors, and forklifts, and PPI for engineering services; IPI for excavating, paving, and construction machinery.
29	Mining and oilfield machinery	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for mining machinery and equipment, PPI for oil and gas field machinery and equipment, PPI for pump and pumping equipment, and PPI for engineering services; IPI for oil drilling, mining, and construction machinery.
30	Service industry machinery	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for automatic vending machines; PPI for commercial laundry and drycleaning industry, PPI for commercial refrigerators and related equipment, PPI for refrigeration condensing units, PPI for measuring and dispensing pumps, PPI for commercial and service industry machinery, PPI for other commercial and service machinery, and PPI for engineering services; IPI for industrial and service machinery and IPI for nonelectrical machinery.
31	Electrical equipment, n.e.c.	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for electric (including microwave) household ranges, ovens, surface cooking units, and equipment, PPI for household refrigerators, including combination refrigerator-freezers, PPI for small electric household appliances, PPI for all other miscellaneous special industry machinery and equipment, PPI for household water heaters, except electric, PPI for residential electric lighting fixtures, PPI for commercial and institutional-type

Table 6.B—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Equipment

Line in NIPA table group 5.5	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
						electric lighting fixtures, including parts and accessories, PPI for industrial-type electric lighting fixtures, including parts and accessories, PPI for all other miscellaneous electric and nonelectric lighting equipment, PPI for storage batteries, PPI for miscellaneous electrical equipment, and PPI for engineering services; IPI for household and kitchen appliances, IPI for other industrial machines, IPI for electric generating equipment, and IPI for scientific and medical machinery.
32	Other	Commodity-flow method, starting with manufacturers' shipments from EC.	Abbreviated commodity-flow method, starting with manufacturers' shipments from ASM.	Abbreviated commodity-flow method, starting with manufacturers' shipments from MSM.	Same as for most recent year.	PPI for carpets and rugs, PPI for farm machinery and equipment, PPI for commercial turf and grounds care equipment, PPI for lawn and garden equipment, PPI for motorcycles, including three-wheel motorbikes, PPI for travel trailers, PPI for self-propelled golf carts and industrial in-plant personnel carriers, PPI for automobile and light truck trailers, PPI for musical instruments, PPI for sporting and athletic goods, PPI for electric signs, PPI for nonelectric signs and displays, PPI for all other miscellaneous equipment, and PPI for engineering services; IPI for textile supplies and related materials, IPI for agricultural machinery and equipment, IPI for automotive vehicles, parts, and engines, IPI for optical, photo, measuring, medical, and musical instruments, and timepieces, IPI for toys, shooting and sporting goods, and IPI for durables, manufactured.

Table 6.B—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Equipment

Line in NIPA table group 5.5	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
33	Less: Sale of equipment scrap, excluding autos	BEA's benchmark I-O accounts, primarily based on wholesale trade data from EC.	Quantity sold times unit price, both from U.S. Geological Survey.	Same as nonbenchmark years.	Quantity estimate reflated using PPI's for ferrous metal scrap and for nonferrous metal scrap.	For annual, PPI for ferrous metal scrap and PPI for nonferrous metal scrap. For current quarter, quantity extrapolation using real private fixed investment in nonresidential equipment, excluding information processing equipment, aircraft and passenger cars.
34	**Residential equipment**	Commodity-flow method, starting with manufacturers' shipments from EC.	Retail control method, using retail sales from Census Bureau annual retail trade survey.	Retail control method, using retail sales from Census Bureau Monthly Retail Trade Survey.	Same as for most recent year.	CPI for furniture and bedding, CPI for major appliances, CPI for floor coverings, and CPI for televisions.

*The description "Same as for benchmark year" indicates that the estimate is prepared using a methodology similar to that used for the benchmark estimate rather than by using an indicator series to interpolate or extrapolate the benchmark estimate.

ASM Annual Survey of Manufactures, Census Bureau
BEA Bureau of Economic Analysis
BLS Bureau of Labor Statistics
CPI Consumer price index, BLS
EC Economic Census, Census Bureau
IPI Import price index, BLS
MSM Monthly Survey of Manufacturers' Shipments, Inventories, and Orders, Census Bureau
n.e.c. Not elsewhere classified
PPI Producer price index, BLS

[1] Includes net purchases of used vehicles.

Table 6.C—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Intellectual Property Products

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates[1]	
2	**Software: [For more detail on the derivation of these estimates, see "Technical Note: Special Estimates"]**					
3	Prepackaged software	Commodity-flow method, starting with industry receipts data from EC.	Abbreviated commodity-flow method, starting with SAS industry receipts data.	Same as for nonbenchmark years.	For third and second estimates, QSS total revenue data; for advance estimates, judgmental trend.	BEA price index based on PPI for software publishing, except games, and quality adjustments by BEA.
4	Custom software	Commodity-flow method, starting with industry receipts data from EC.	Abbreviated commodity-flow method, starting with SAS industry receipts data.	Same as for nonbenchmark years.	For third and second estimates, QSS total revenue data; for advance estimates, judgmental trend.	Weighted average of the prepackaged software price and of a BEA input-cost index. The input cost index reflects an explicit adjustment for changes in productivity and is based on BLS data on wage rates for computer programmers and systems analysts and on intermediate input costs associated with the production of software; the adjustment is based primarily on BLS multifactor productivity index.
5	Own-account software [For more detail, see "Technical Note: Special Estimates."]	Production costs based on BLS Occupational Employment Statistics Survey data and on EC data.	Production costs based on BLS occupational employment statistics data.	Same as for nonbenchmark years.	Based on CES data.	Weighted average of the prepackaged software price and of a BEA input-cost index. The input cost index reflects an explicit adjustment for changes in productivity and is based on BLS data on wage rates for computer programmers and systems analysts and on intermediate input costs associated with the production of software; the adjustment is based primarily on BLS multifactor productivity index.
6	**Research and development: [For more detail on the derivation of these estimates, see "Technical Note: Special Estimates"]**					
7	Business:					
8-15	Manufacturing	R&D expenses from NSF, reconciled with EC data.	Expenses based on NSF R&D surveys and on SAS industry receipts data.	Based on company financial reports, and on SAS industry receipts data.	For third and second estimates, company financial reports and QSS total revenue data;	Weighted average of BEA productivity-adjusted composite input-cost indexes, with weights derived from NSF survey data.

Table 6.C—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Intellectual Property Products

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates[1]	
					for advance estimates, judgmental trend [unpublished].	
16	Nonmanufacturing:					
17	Scientific research and development services	R&D expenses from NSF, reconciled with EC data.	Expenses based on NSF R&D surveys and on SAS industry receipts data.	Based on company financial reports and on SAS industry receipts data.	For third and second estimates, company financial reports and QSS total revenue data; for advance estimates, judgmental trend. [unpublished]	Weighted average of BEA productivity-adjusted composite input-cost indexes, with weights derived from NSF survey data.
18	All other nonmanufacturing:					
19	Software publishers	R&D expenses from NSF, reconciled with EC data.	Expenses based on NSF R&D surveys and on SAS industry receipts data.	Based on company financial reports and on SAS industry receipts data.	For third and second estimates, company financial reports and QSS total revenue data; for advance estimates, judgmental trend. [unpublished]	Weighted average of the BEA prepackaged software price and of a BEA input-cost index. The input cost index reflects an explicit adjustment for changes in productivity and is based on BLS data on wage rates for computer programmers and systems analysts and on intermediate input costs associated with the production of software; the adjustment is based primarily on BLS multifactor productivity index.
20	Financial and real estate services	R&D expenses from NSF, reconciled with EC data.	Expenses based on NSF R&D surveys	Based on company financial reports and on SAS	For third and second estimates, company financial	Weighted average of BEA productivity-adjusted composite input-cost indexes, with weights derived from NSF survey data.

Table 6.C—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Intellectual Property Products

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates[1]	
			and on SAS industry receipts data.	industry receipts data.	reports and QSS total revenue data; for advance estimates, judgmental trend. [unpublished]	
21	Computer systems design and related services	R&D expenses from NSF, reconciled with EC data.	Expenses based on NSF R&D surveys and on SAS industry receipts data.	Based on company financial reports and on SAS industry receipts data.	For third and second estimates, company financial reports and QSS total revenue data; for advance estimates, judgmental trend. [unpublished]	Weighted average of the BEA prepackaged software price and of a BEA input-cost index. The input cost index reflects an explicit adjustment for changes in productivity and is based on BLS data on wage rates for computer programmers and systems analysts and on intermediate input costs associated with the production of software; the adjustment is based primarily on BLS multifactor productivity index.
22	Other nonmanufacturing	R&D expenses from NSF, reconciled with EC data.	Expenses based on NSF R&D surveys and on SAS industry receipts data.	Based on company financial reports and on SAS industry receipts data.	For third and second estimates, company financial reports and QSS total revenue data; for advance estimates, judgmental trend. [unpublished]	Weighted average of BEA productivity-adjusted composite input-cost indexes, with weights derived from NSF survey data.
23	Nonprofit institutions serving households:					
24	Universities and colleges	R&D expenses from NSF, reconciled with EC data.	Expenses based on NSF R&D surveys.	Judgmental trend.	CES data for the education and health industry. [unpublished]	Weighted average of BEA productivity-adjusted composite input-cost indexes, with weights derived from NSF survey data.
25	Other nonprofit institutions	R&D expenses from NSF, reconciled with EC data.	Expenses based on NSF R&D surveys.	SAS data on expenses for tax-exempt	CES data for the educational and	Weighted average of BEA productivity-adjusted composite input-cost indexes, with weights derived from NSF survey data.

Table 6.C—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Intellectual Property Products

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates[1]	
				establishments. federal agency data, and judgmental trend.	health industry. [unpublished]	
26	**Entertainment, literary, and artistic originals: [For more detail on the derivation of these estimates, see "Technical Note: Special Estimates"]**					
27	Theatrical movies	BEA benchmark I-O accounts, based on revenue data from EC and adjusted by BEA.	SAS revenues for selected product lines.	Same as for nonbenchmark years.	For third estimate, QSS revenue data; for second and advance estimates, judgmental trend. [unpublished]	Weighted average of CPI for live performances, PPI for photocopying equipment (including motion picture equipment), and PPI for electronic computer manufacturing.
28	Long-lived television programs	BEA benchmark I-O accounts, based on revenue data from EC and adjusted by BEA.	SAS revenues for selected product lines.	Same as for nonbenchmark years.	For third estimate, QSS revenue data; for second and advance estimates, judgmental trend. [unpublished]	Weighted average of CPI for live performances, PPI for photocopying equipment (including motion picture equipment), and PPI for electronic computer manufacturing.
29	Books	BEA benchmark I-O accounts, based on revenue data from EC and adjusted by BEA.	SAS revenues for selected product lines.	Same as for nonbenchmark years.	For third estimate, QSS revenue data; for second and advance estimates, judgmental trend. [unpublished]	PPI for book publishers.
30	Music	BEA benchmark I-O accounts, based on revenue data from EC and adjusted by BEA.	Primarily SAS revenues for selected product lines.	Same as for nonbenchmark years.	For third estimate, QSS revenue data; for second and advance estimates,	CPI for prerecorded and blank audio disks/tapes/digital files/downloads and CPI for live performances.

Table 6.C—Summary of Methodology Used to Prepare Estimates of Private Fixed Investment in Intellectual Property Products

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates[1]	
					judgmental trend. [unpublished]	
31	Other	BEA benchmark I-O accounts, based on revenue data from EC and adjusted by BEA.	Primarily SAS revenues for selected product lines.	Same as for nonbenchmark years.	For third estimate, QSS revenue data; for second and advance estimates, judgmental trend. [unpublished]	CPI for live performances, PPI for greeting card publishers, and CPI for photo studios.

*The description "Same as for benchmark year" indicates that the estimate is prepared using a methodology similar to that used for the benchmark estimate rather than by using an indicator series to interpolate or extrapolate the benchmark estimate.

BEA Bureau of Economic Analysis
BLS Bureau of Labor Statistics
CES Current employment statistics, BLS
CPI Consumer price index, BLS
EC Economic Census, Census Bureau
NSF National Science Foundation
PPI Producer price index, BLS
QSS Quarterly Services Survey, Census Bureau
SAS Service Annual Survey, Census Bureau

[1] Because of data limitations, BEA does not publish current quarterly estimates for individual research and development and entertainment-original components. Current quarterly estimates of total business research and development and entertainment originals are published in NIPA table group 5.3.

Technical Note: Special Estimates

This section provides additional detail on the sources and methods used to estimate the following key components of private fixed investment (PFI): new single-family structures, used equipment, and intellectual property products.

New single-family structures

This PFI component measures the construction of fully detached units and of other units (such as rowhouses and townhouses) that are separated from adjacent units by a ground-to-roof wall and that do not share heating/air conditioning systems or other interstructural public utilities (such as water supply, power supply, or sewage disposal lines). The value of new single-family construction excludes the value of land, marketing costs, closing costs, and movable appliances.

The annual and quarterly estimates of investment in new single-family structures are based on the Census Bureau's monthly construction statistics on the value of new construction put in place for one-unit structures. The Census Bureau determines the construction cost of new single-family houses started each month using data from its monthly Survey of Construction. Construction costs are estimated separately for units built to be sold or rented and for units built by an owner or for an owner on contract.

The estimated cost of all single-family units started is then distributed into monthly value put in place by applying fixed 12-month patterns of monthly construction progress.[28] The patterns vary somewhat depending on the particular month the unit is started; in general, the progress pattern assumes that about 16 percent of the project is completed in the first month, about 23 percent in the second month, about 20 percent in the third month, about 15 percent in the fourth month, about 10 percent in the fifth month, and the remainder is distributed in declining amounts over the succeeding 7 months.

For the advance current quarterly estimate, only 2 months of value-put-in-place data are available. BEA estimates the value put in place for the third month, primarily based on data on housing starts for that month and on the Census Bureau's construction progress pattern.

Quantity estimates. The estimates of investment in real new single-family structures are prepared by deflation, using the Census Bureau price index for new one-family houses under construction.

[28] For more information, see "Construction Methodology" at www.census.gov.

Used equipment

Aside from trade margins and commissions earned by the services of brokers and dealers, transactions in secondhand fixed assets among sectors do not reflect current production activity and so do not affect gross domestic product. However, these transfers of assets between sectors are recorded in the NIPAs so that the estimates of fixed investment are consistent with the estimates of the net stock of private fixed assets. Moreover, the estimates of saving by the individual sectors of the economy must reflect purchases of used equipment as well as purchases of new equipment. Thus, net purchases of used equipment by private business from households, governments, and the rest of the world are added to investment in equipment and software and are subtracted (as net sales) from personal consumption expenditures, from government fixed investment, and from net exports, respectively. Sales of used motor vehicles by business to persons account for the bulk of these intersectoral transactions; thus in the NIPAs, total net purchases of equipment by private business is negative. (For a detailed description of the methodology used to prepare the NIPA estimates for net purchases of used motor vehicles, see the technical note in "Chapter 5: Personal Consumption Expenditures").

For benchmark years, transactions in used equipment by commodity (other than motor vehicles) are derived as the sum of the trade margins on sales of used equipment and of net sales of used equipment between business and the other sectors of the economy. The trade margins are estimated using information from the Census Bureau's Economic Census. Net sales between business and persons are also from the Economic Census. Net sales between business and the federal government are from federal agency source data, primarily from the Government Services Administration; net sales between business and state and local governments are from the Census Bureau's census of governments. Net exports of used equipment are based on Census Bureau foreign trade data.

For nonbenchmark years other than the most recent year, net exports are based on foreign trade data, net sales between business and government are from federal agency source data and from the annual survey of government finances, and trade margins and net sales between business and other sectors are prepared by extrapolation using the change in new nonresidential equipment.

For the most recent year and for the current quarters, the estimates by component are prepared by extrapolation using the change in new nonresidential equipment for that component.

Quantity estimates. For all years and for current quarters, the estimates of real net transactions in used equipment by component are prepared by deflating the current-dollar estimates using the component deflators listed in table 6.B.

Intellectual property products

This PFI component comprises purchases and own-account production of software, expenditures for research and development (R&D), and expenditures on entertainment, literary, and other artistic originals. Most intellectual property products are not sold in an open market, so other valuation methods must be used in measuring the investment in these assets. Thus, investment in own-account software and in R&D is measured as the sum of production costs, and investment in entertainment originals is measured using net present valuation.

Software

Investment in software comprises purchases of prepackaged software and of customized software from companies that are primarily engaged in software development and of expenditures for the own-account production of new or significantly enhanced software that the business enterprise develops in-house.

Purchased software

For benchmark years, the current-dollar estimates for purchases of prepackaged software and for custom software are based on industry receipts data from the Census Bureau's Economic Census and are derived using the commodity-flow method (for a general description of this method, see "Commodity-flow method" in "Chapter 4: Estimating Methods"). For nonbenchmark years, the estimates are based on industry receipts data from the Census Bureau's Service Annual Survey and are derived using an abbreviated commodity-flow method (described earlier in this chapter). For the current quarterly estimates, the "second" and "third" estimates are based on revenue data from the QSS, and the "advance" estimate is based on judgmental trends.

Quantity estimates. The estimates of real expenditures for purchased software are prepared by deflating the current-dollar estimates (see the section "Estimates for detailed components" in chapter 4). For packaged software, the deflator is a BEA price index that is based on the "producer price index for software publishing, except games" and adjusted for quality change by BEA; this adjustment is based on studies comparing hedonic-type price indexes with matched-model price indexes. For custom software, the deflator is a weighted average of the prepackaged software price and a BEA input-cost index that is based on Bureau of Labor Statistics' (BLS) data on wage rates for computer programmers and systems analysts and on intermediate input costs associated with the production of software.

Own-account software

Expenditures for own-account software are measured as the sum of production costs, which include compensation (wage and nonwage) of employees, the costs of intermediate inputs, and a BEA-derived measure of capital services (including depreciation). Own-account software does not include the development of software

originals from which copies are made for sale or incorporated into other products (such as motor vehicles or appliances); these are instead included in research and development.[29]

The estimates of wages for all years are derived by multiplying the number of programmers and systems analysts in selected industries times the wage rate in those industries. Wages are reduced by half under the assumption that these programmers and analysts spend only about half their time working on the development of new or enhanced own-account software. In addition, wages are reduced by subtracting the portion of wages of programmers and analysts employed by the "computer systems design and related services industry" that represents the production of custom software for sale; sales of the custom software produced by this industry are already included in the PFI estimates of custom software. The data on the number of programmers and analysts by industry and the data on wages by occupation are from the BLS occupational employment statistics survey.

The estimates of nonwage compensation are based on relationships between wage and nonwage compensation derived from NIPA data by industry. The estimates of input costs are based on relationships between intermediate inputs and compensation that are derived primarily from the Census Bureau's Economic Census.

The estimates of expenditures for own-account software for the current quarters are prepared by extrapolation, using an index of employment in four industries for which computer-related occupations account for a relatively high portion of total employment. The index is derived using BLS current employment data for computer systems design and related services; software publishers; data processing, hosting, and related services; and computer and peripheral equipment manufacturing.[30]

Quantity estimates. The estimates of real expenditures for own-account software are derived by deflation, using the BEA price index for custom software.

Research and development

Research and development (R&D) includes expenditures for the discovery or development of new products, of improvements to existing products, and of new or more efficient processes of production.[31] R&D expenditures for the development of software

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[29] For more information, see Jason W, Chute, Stephanie H. McCulla, and Shelly Smith, "Preview of the 2018 Comprehensive Revision of the National Income and Product Accounts," *Survey* 98 (April 2018): 12.
[30] This methodology for the current quarterly estimates was introduced in the 2010 annual update of the NIPAs; see Eugene P. Seskin and Shelly Smith, "Annual Revision of the National Income and Product Accounts," *Survey* 90 (August 2010): 22–23.
[31] For details on the estimating methods underlying estimates of investment in research and development, see Marissa J. Crawford, Jennifer Lee, John E. Jankowski, and Francisco A. Moris, "Measuring R&D in the National Economic Accounting System," *Survey* 94 (November 2014): 1-15. The treatment of R&D expenditures by business, government, and nonprofit institutions serving households as fixed investment was introduced in the 2013 comprehensive update of the NIPAs: see "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts,": 14–18.

originals from which copies are made for sale or incorporated into other products is also included.

For benchmark years and for nonbenchmark years, the estimates of private fixed investment in R&D are primarily based on R&D expenditures data from two National Science Foundation (NSF) annual surveys: the Business Research and Development and Innovation Survey and the Higher Education Research and Development Survey. These surveys are based on R&D by performer, but they also collect data on the funder of the R&D, and BEA uses these data to put R&D investment on an ownership basis. (Federal purchases and grants of R&D are both treated as investment by the federal sector because the federal government receives economic benefits and because of the difficulty in distinguishing ownership between the funder and the performer of the R&D in the source data.) In addition to the NSF data, revenue data from the Census Bureau's Service Annual Survey (SAS) are used in the R&D calculations.

BEA then further adjusts the data for coverage, for scope, and for alignment with NIPA framework and concepts. These adjustments include (1) accounting for imported and exported R&D, (2) adding social science R&D, which is captured separately on the NSF surveys, (3) converting depreciation for structures and equipment used to produce R&D to an economic cost basis, (4) reconciling the NSF data with data from the Census Bureau's economic censes (only in benchmark years), (5) replacing NSF reported expenditures for deprecation with BEA-derived capital services measures (which include depreciation)[32],and (6) in certain cases, converting measures for purchased R&D from a cost-basis to a purchase-basis.

For the most recent year, the estimates for business R&D investment are extrapolated based on R&D expenses reported by publicly traded companies on their annual financial statements, and on SAS industry receipts data on scientific research and development services . For nonprofit institutions serving households (NPISHs), the estimates for universities and colleges are based on judgmental trend, and the estimates for other NPISHs are based on federal budget data on R&D outlays to NPISHs, SAS data on expenses for tax-exempt establishments, and judgmental trends.

For the current quarterly estimates, the "third" and "second" estimates for total business R&D are extrapolated based on R&D expenses from the quarterly financial reports of publicly traded companies, and on revenue data from the QSS. The "advance" estimate is based on judgmental trends. The R&D estimates for both academic and nonacademic NPISHs are based on BLS current employment statistics on aggregate wages for the education and health industry.[33]

Quantity estimates. The estimates of real expenditures for R&D are prepared by deflation. For own-account R&D and for purchases from other businesses, nonacademic NPISHs, and state and local governments, the deflator is a Fisher-weighted price index of

[32] For more information, see Chute, McCulla, and Smith (2018).
[33] Because of data limitations, BEA does not publish current quarterly estimates for individual R&D components. Current quarterly estimates for total business R&D are provided in NIPA table group 5.3.

productivity-adjusted, input-cost based indexes for two specific industries: scientific research and development services, and all other private industries. The input-cost indexes are composed of wages, materials and supplies, economic depreciation, and other costs, and the weights for these cost components are derived from the NSF Business Research and Development and Innovation Survey. For purchases from academic institutions, the deflator is a productivity-adjusted, input-cost based index composed of university faculty and research associates' compensation, overhead, purchased services, materials and supplies, and economic depreciation, and the weights for these cost components are derived from the NSF Higher Education Research and Development Survey.

Entertainment, literary, and artistic originals

Entertainment, literary, and artistic originals consists of theatrical movies, long-lived television programs, books, music, and other miscellaneous entertainment (such as theatrical play scripts, greeting card designs, and commercial stock photography).[34] The production of entertainment originals may span several years. Theoretically, these costs should be recorded as investment when accrued; however, due to practical constraints, BEA records the value of the investment in the year the asset is released to the public. Because adequate information on production costs is not available for most entertainment originals, BEA estimates the value of these assets based on the net present value (NPV) of expected future royalties or other revenue obtained from these assets, net of any associated sales costs.[35] For each type of entertainment originals asset, the expected net cash flow of the producing industry is estimated using revenue and cost data from the Census Bureau's economic censuses and surveys, numerous trade sources, and other sources. BEA assumes a 7-percent real discount rate for all asset types and applies an NPV adjustment factor, a ratio that represents the average NPV-to-current-year revenues in order to derive an estimate of investment in entertainment originals for that year.

For benchmark years, the estimates for entertainment originals are based on product-level revenue detail from the Census Bureau's Economic Census that is adjusted to remove nonartwork costs (which are recorded as current production costs). These data are then adjusted by applying BEA-generated investment ratios (net-present value factors) to derive the investment values.[36]

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[34] The treatment of expenditures by business and nonprofit institutions serving households on entertainment originals as fixed investment was introduced in the 2013 comprehensive update of the NIPAs: see "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts," 18–20.

[35] The SNA discusses the use of NPV for estimating the value of assets; see *SNA 2008*, 22, paragraph 2.60, 52, paragraph 3.137-138); see also the Organisation for Economic Cooperation and Development's *Handbook on Deriving Capital Measures of Intellectual Property Products*, 18, 158-159.

[36] Based on research using trade sources, studies, and survey and Economic Census data, BEA estimates the following investment ratios for the five categories of entertainment originals assets: 51 percent of industry revenue for theatrical movies, 50 percent of industry revenue for music, 37 percent of industry revenue for books, 30 percent of industry revenue for television, and 15 percent of industry revenue for miscellaneous artwork.

First, total current-period revenue from licensing fees, merchandise sales, ticket sales, and other revenue generating activities for the industries producing the assets are estimated. Second, the value of sales costs—such as advertising, manufacturing of reproductions, and other marketing type costs—is subtracted from the total current period revenues to derive net revenue values that capture only the revenues earned on the intangible assets held by the business. Third, these net revenue values are adjusted further to only include the revenue from the release of new works (that is, the "originals"), using the BEA-derived investment ratios.[37] Finally, the NPV adjustment factor is applied to the net revenue value that has been adjusted by the investment ratio in order to derive the current-period investment value of the future revenue stream of these new works.

For nonbenchmark years, the estimates for entertainment originals are derived by extrapolation, primarily based on revenue data for selected product lines from the Census Bureau's Service Annual Survey.

For current quarterly estimates of total business entertainment originals, the "third" quarter estimates are based on revenue data from the QSS. The "second" and "advance" estimates for long-lived television programs, books, and other entertainment originals are based on judgmental trends.[38]

Quantity estimates. The estimates of real expenditures on entertainment originals are prepared using a variety of deflators. For theatrical movies, the deflator is a weighted average of the CPI for live performances, the PPI for photocopying equipment (including motion picture equipment), and the PPI for electronic computer manufacturing. For long-lived television programs, the deflators are composed of the CPI for live performances, the PPI for photocopying equipment (including motion picture equipment), and the PPI for electronic computer manufacturing with differing weights for fiction and nonfiction programming. For books, the deflator is the PPI for book publishers. For music, the deflator for recorded music is the CPI for prerecorded and blank audio disks/tapes/digital files/downloads, and the deflator for nonrecorded music is the CPI for live performances. For other entertainment originals, the deflator for theatrical plays is the CPI for live performances, the deflator for greeting cards is the PPI for greeting card publishers, and the deflator for stock photos is the CPI for photo studios.

[37] Based on research using trade sources, studies, and survey and Economic Census data from the Census Bureau, BEA estimates the following investment ratios for the five categories of entertainment originals assets: 51 percent of industry revenue for theatrical movies, 30 percent of industry revenue for television, 37 percent of industry revenue for books, 50 percent of industry revenue for music, and 15 percent of industry revenue for miscellaneous artwork. The remaining revenue is spent on nonartwork costs such as advertising, stamping DVDs, or printing books. The NIPAs record these nonartwork costs as current production costs.

[38] Because of data limitations, BEA does not publish current quarterly estimates for individual entertainment-original components. Current quarterly estimates of total business entertainment originals are provided in NIPA table group 5.3

CHAPTER 7: CHANGE IN PRIVATE INVENTORIES

(Updated: October 2019)

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Change in private inventories (CIPI), or inventory investment, is a measure of the value of the change in the physical volume of the inventories—additions less withdrawals—that businesses maintain to support their production and distribution activities.

Inventory investment is one of the most volatile components of gross domestic product (GDP), giving it an important role in short run variations in GDP growth. Moreover, inventory movement plays a key role in the timing, duration, and magnitude of business cycles, as unanticipated buildups in inventories may signal future cutbacks in production, and unanticipated shortages in inventories may signal future pickups in production.

The CIPI estimates are the building blocks for BEA's estimates of inventory stocks. These stock estimates, coupled with BEA's estimates of final sales, form inventory-sales ratios that can be used to assess the likelihood that businesses will add to, or reduce, inventories in response to changes in demand.

The CIPI estimates are an integral part of the U.S. national income and product accounts (NIPAs), a set of accounts that provides a logical and consistent framework for presenting statistics on U.S. economic activity (see "Chapter 2: Fundamental Concepts").

Definitions and Concepts

CIPI is the NIPA measure of the flow (or change) in the stock of inventories held by private business over a specified period.[1] The stock of inventories is the value of the goods owned by private business at the end of a specified period, whether the goods were produced or acquired in that period or in previous periods.

Inventories are maintained by business in order to facilitate the production and distribution of goods or services. The items held in inventory may be in the form of goods ready for sale (finished goods), of goods undergoing production (work in process), or of goods acquired for use in the production process (materials and supplies) (table 7.1). For example, an auto dealer keeps a variety of makes, models, and parts on hand to meet the varied requirements and preferences of potential customers; an auto manufacturer keeps supplies of inputs, such as steel, on hand for use in manufacturing new vehicles.

Table 7.1—Content of Change in Private Inventories

Category of inventory	Comments
Finished/ready-for-sale goods inventory	The value of produced goods held for future sale. Applies to most industries.
Work-in-process inventory	The value of goods still in the process of production. Applies to manufacturing and publishing industries.
Materials and supplies inventory	The value of natural resources and basic manufactured goods that are acquired by business for use as inputs to the production process. Applies to manufacturing, mining, construction, utilities, and publishing industries.

A general principle underlying NIPA accounting is that production should be recorded at the time it occurs. In the measurement of GDP, the other product-side components, such as personal consumption expenditures (PCE) and fixed investment, record final sales in the current period, but these sales may involve goods that were produced—or at least partially produced—in earlier periods. The recording of movements of goods in inventory—materials and supplies, work-in-process, and finished goods—and from inventories to final sales provides the means to allocate production to the period in which it occurred (see the box on the next page for a simple example of the allocation).

[1] In the NIPAs, private business consists of all private entities that produce goods and services for sale at a price intended to at least approximate production costs and of certain other private entities that are treated as business in the NIPAs. These other entities include mutual financial institutions, private noninsured pension funds, cooperatives, and nonprofit organizations that primarily serve business (that is, entities classified as nonprofit by the Internal Revenue Service in determining income tax liability), Federal Reserve banks, and federally sponsored credit agencies.

Simple Example of CIPI Role in Calculating GDP

	[Billions of dollars]				
	Auto Manufacturer		Auto dealer		GDP
	Materials and supplies	Finished goods	Goods ready for sale	Sales	
I	-10,000	+20,000	…..	…..	+10,000
II	…..	-20,000	+20,000	…..	0
III	…..	…..	-20,000	+22,000	+2,000

- At the beginning of period I, an auto manufacturer has in inventory $10,000 of steel and other materials and supplies that it will use as inputs to produce an automobile.
- In period I, the manufacturer uses the materials and supplies from inventory and its own resources (such as labor) to produce the automobile. The value of the materials and supplies used ($10,000) is subtracted from those inventories, and the value of the produced automobile ($20,000) is added to the finished goods inventory. Thus, total change in inventories is +$10,000, and this amount—which represents production, or value added, in this period—is added to GDP.
- In period II, the manufacturer ships the finished auto to an auto dealer. The value of the manufacturer's finished goods inventory decreases by $20,000, and the value of the dealer's inventory of autos ready for sale increases by $20,000. GDP is not affected.
- In period III, the dealer sells the auto to a consumer for $22,000. The dealer's inventory declines by $20,000. GDP increases by $2,000 (PCE of $22,000 plus CIPI of –$20,000), which represents the value added by the dealer in the form of retail margin.

As a result of this accounting for inventories, the process of assembling the materials and supplies into a finished automobile is recorded in period I, when it actually occurred, rather than in period III, when the final sale occurred. Similarly, the value added by steel manufacturers and other producers of the materials and supplies that were used as inputs in period I would have been recorded in earlier periods when those goods were produced.

In measuring the level of GDP, the change in, not the level of, inventories provides the appropriate measure of the flow of economic activity that is consistent with that measured by the other GDP components. A positive CIPI indicates that total production (GDP) exceeded the sum of the final sales components of GDP in the current period and that the excess production was added to inventories. A negative CIPI indicates that final sales exceeded production in the current period and that the excess sales were filled by drawing down inventories. CIPI is valued in the average prices for the period because units move in and out of inventories continuously over the course of the period.

In measuring the change in GDP, the change in CIPI (or the change in inventory investment) is the relevant measure. For example, inventories may contribute to an increase in GDP (1) by accumulating in the current period after decumulating in the preceding period, (2) by accumulating more in the current period than in the preceding period, or (3) by decumulating less in the current period than in the preceding period (table 7.2).

Table 7.2—Effects of Change in CIPI on Change in GDP
[Billions of dollars]

	Inventory level [stock]			CIPI [flow]		Contribution of change in CIPI to change in GDP
	I	II	III	II	III	III
(1)	500	495	500	-5	5	10
(2)	500	510	530	10	20	10
(3)	500	485	480	-15	-5	10

Most of the CIPI estimates are derived from information recorded in business-accounting statements. For an illustration of the relationships between business-accounting practices and the principles of national accounting and their varying impacts on the measurement of inventories, cost of goods sold, and profits, see appendix A to this chapter.

In business accounting, the change in the book value of inventories is the measure of the difference between inventory acquisitions and inventory withdrawals during the accounting period. Generally, when a good is placed in inventory, it is valued on a firm's books at the price prevailing when the good enters into inventory; this is sometimes referred to as "acquisition" or "historical" cost. However, there are a number of different accounting methods—such as "last in, first out" (LIFO) and "first in, first out" (FIFO)—that can be used in determining the value of the goods that are withdrawn from inventories and of the goods that remain in inventories over time.[2]

Another general principle underlying NIPA accounting is that (a) production should be valued at the price prevailing when it occurs, regardless of whether the good is sold immediately or it is entered into inventory for sale at a later time, and (b) a good that is withdrawn from inventory must be valued at the price prevailing when it is withdrawn, so holding gains or losses do not affect the measure of production in the current period. In business accounting, a good leaving inventory is frequently valued at historical cost—that is, at the price that prevailed when it entered inventory (see appendix A). The

[2] LIFO is a method of accounting valuation of inventories that assumes the goods acquired most recently are used up first, so that withdrawals from inventory are primarily valued at recent acquisition costs. FIFO is a method that assumes the oldest stock in inventories is used up first, so withdrawals from inventory are primarily valued at earlier acquisition costs. Other valuation methods include "average cost," "market cost," and "standard cost."

difference between the business-accounting measure of change in the book value of inventories and the NIPA measure of CIPI is the gain or loss from holding goods in inventory; it is termed the *inventory valuation adjustment* (IVA) (see the section "Overview of Source Data and Estimating Methods").

Recording in the NIPAs

As described above, CIPI provides a bridge between final sales in the current period and production in the current period. It is one of the few NIPA components that can be negative. In the seven summary accounts of the NIPAs, CIPI appears in the Domestic Income and Product Account (account 1) as a component of gross private domestic investment and in the Domestic Capital Account (account 6) as a component of gross domestic investment.

In the NIPAs, the inventory estimates are generally shown by industry classification, using the North American Industry Classification System, rather than by type of product classification (see chapter 2). Thus, for example, "wholesale trade durable goods inventories" signifies "inventories held by industries engaged in the wholesale trade of durable goods." CIPI by industry is presented in NIPA table group 5.7. Stocks of private inventories, along with the corresponding aggregate estimates of final sales and inventory-sales ratios, are shown in table group 5.8.

The following is a list of the principal NIPA tables that present the inventory estimates:

5.7.5B Change in Private Inventories by Industry
5.7.6B Change in Real Private Inventories by Industry, Chained Dollars
5.8.5B Private Inventories and Domestic Final Sales by Industry
5.8.6B Real Private Inventories and Real Domestic Final Sales by Industry, Chained Dollars
5.8.9B Implicit Price Deflators for Private Inventories by Industry

In addition, estimates of change in motor vehicle inventories are shown in tables 7.2.5B and 7.2.6B, and estimates of change in farm inventories are shown in tables 7.3.5 and 7.3.6.

BEA also prepares estimates of the change in private inventories that are not seasonally adjusted; these are available in Section 8 of the NIPA Interactive Data Tables. The tables present nominal, or "current-dollar" measures and "real," or inflation-adjusted measures.

Additionally, BEA prepares "Underlying Detail" tables for the estimates shown in NIPA table group 5.7, including detail for change in the book values and for IVA by industry, at a greater level of detail than is shown in the published estimates.

BEA publishes estimates of real inventories, sales, and inventory-sales ratios for the manufacturing and trade industries each quarter in the S*urvey of Current Business*

(generally in the January, April, July, and October issues). BEA also prepares "Underlying Detail" tables for these estimates.

Overview of Source Data and Estimating Methods

As described earlier in this handbook, the NIPA estimates, including those for CIPI, are prepared using a wide variety of source data (see "Chapter 3: Principal Source Data") and using estimating methods that adjust the source data to the required NIPA concepts and that fill in gaps in coverage and timing (see Chapter 4: Estimating Methods).

For farm inventories, the estimates of crop and of livestock inventory change are prepared as the product of the change in the physical volume and of the average price, based on data from the U.S. Department of Agriculture (USDA). For example, changes in stocks of wheat on the farm are calculated as wheat harvested and available for sale less wheat sold, valued at average market prices. The estimates of farm inventories include materials and supplies—such as feed, fertilizer, and purchased seed—that are used as inputs to farm production. For crops, the estimates also take into account Commodity Credit Corporation (CCC) loans to producers who use agricultural commodities as collateral.[3] Because the estimates of farm inventories are prepared using data on quantities and current prices rather than business-accounting data, an IVA is not calculated.

For nonfarm industries, the estimates of inventory change are generally prepared by beginning with data on the end-of-period book value of inventories, as reported by private business using a variety of accounting methods.[4] The inventory data are then adjusted—annually for 417 detailed industries and monthly for 82 aggregated industries—to value the inventories at a uniform set of prices and to remove holding gains or losses.

More specifically, for manufacturing and trade industries, data on the book value of inventory stocks, inventory turnover, and on the methods of inventory valuation are collected in economic censuses and annual surveys conducted by the Census Bureau. Businesses that use LIFO accounting also provide the Census Bureau with an estimate of the "LIFO reserve," an adjustment for converting their inventories to a non-LIFO valuation. Data on inventory stocks at the end of the month (and quarter) are collected in

[3] Placement of crops as collateral for CCC loans is treated as an addition to farm inventories. Redemption of the crop after loan repayment or forfeiture of the crop after loan default are each treated as a withdrawal from farm inventories. The data on the physical quantities of crops placed, redeemed, and forfeited are from USDA and are valued using average market prices.

[4] As a practical matter, the source data for end-of period inventories reflect losses that result from damage, theft, and other causes, as well as business write-downs. When these episodic events can be identified, BEA adjusts the source data to remove these affects.

the Census Bureau's monthly surveys. In the Census Bureau's published reports of manufacturing and trade inventories, all inventories are valued on a "non-LIFO basis."[5]

For most other nonfarm industries, annual data on the book value of inventory stocks are available from Internal Revenue Service (IRS) tabulations of business tax returns. The data include information on inventory stocks, the proportions of those stocks that are valued on a LIFO basis, and inventory turnover.

For most nonfarm industries, the principal price data used in estimating NIPA inventories are producer price indexes (PPIs) and import price indexes, both from the Bureau of Labor Statistics (BLS). For the manufacturing and publishing industries, the prices for work-in-process and finished goods inventories consist of a combination of the following: the cost of materials and supplies, based on PPIs; labor costs, based on BEA-constructed unit labor cost indexes; and overhead costs—including rent, depreciation charges, and repair costs—primarily based on PPIs. The BEA labor cost indexes cover compensation of production workers, supervisors, and nonproduction personnel working at the plant and are based on BEA wage data.

At the most detailed level for which BEA prepares estimates, the procedure for nonfarm inventories generally consists of the following steps that yield current-dollar and constant-dollar estimates for CIPI and for the stocks of goods held in inventory. For an illustration of the estimation procedure, see appendix B to this chapter.

1. Separating Census Bureau published inventories (which are on a non-LIFO basis) into those that were reported on a LIFO basis and those that were reported using other accounting methods.
2. Construction of current-period inventory price indexes for each industry, and for manufacturing and for publishing, each stage of fabrication.
3. Construction of monthly cost indexes for each industry, and for manufacturing and publishing, each stage of fabrication.
4. Revaluation of the book-value inventories to yield constant-dollar and current-dollar change in inventories.
5. Calculation of the IVA.
6. Calculation of current-dollar and constant-dollar stocks.

As noted earlier, the IVA is the measure of the holding gains or losses that are removed from the business-accounting measure of inventory change. It is calculated for all inventory-accounting methods, regardless of whether inventories are accumulating or decumulating over the recording period. However, under LIFO accounting, if inventories are accumulating, withdrawals are already valued at current-period prices; thus, CIPI and change in the book value are equal, and the IVA is zero (see appendix A).

[5] The Census Bureau reports inventories on a non-LIFO basis because during periods of rising inventories and prices, LIFO accounting may result in stock estimates that are considerably undervalued (see appendix A).

In the NIPAs, the IVA is also used on the income side of the accounts in order to exclude the inventory holding gains (or losses) from business income in the calculation of corporate profits and of nonfarm proprietors' income.[6] Since profit and income data come from IRS tabulations, the product-side IVA must be adjusted for any accounting-basis differences between the IRS data and the Census Bureau data. (The estimates for nonfarm industries other than manufacturing and trade are already based on IRS data, so in most cases no adjustment is needed for those industries.)

In estimating the stocks of private inventories, the constant-dollar estimates are derived first, using the perpetual inventory method—that is, by adding the change in real private inventories during the period to the real stocks at the end of the preceding period (see "perpetual inventory method" in chapter 4). The end-of-period current-dollar estimates of the stock of private inventories are then derived by "reflation"—that is, by multiplying estimates of the end-of-period real-stocks by appropriate price indexes.

Table 7.A at the end of this chapter summarizes the source data and estimating methods that are used to prepare the benchmark-year, nonbenchmark-year, current quarterly, and quantity (inflation-adjusted) estimates for the CIPI categories that are shown by industry in NIPA table group 5.7. The source data and methods for the current quarterly estimates reflect both seasonally adjusted and not seasonally adjusted estimates unless otherwise noted.

Benchmark-year estimates

For manufacturing, data on the book value of inventory stocks and on the methods of inventory valuation are available from the Census Bureau's Economic Census. Manufacturing establishments report their end-of-year inventory levels and their inventories by stage of fabrication (finished, work-in-process, and materials and supplies). Information on the distribution of costs in the manufacturing sector among materials, labor, and overhead is used in the calculation of cost of goods sold and of inventory turnover ratios (see appendix B). The commodity composition of materials held in inventory is assumed to be the same as that for materials purchased by the industry, which, in turn, is derived from BEA's benchmark input-output accounts, based on information from the economic censuses on materials "consumed" by industry. This information is used in the calculation of materials held in inventory.

For wholesale and retail trade, data on the book value of inventory stocks and the methods of inventory valuation are available from the Economic Census. Retail and wholesale trade establishments report their inventories of goods for sale at the end of the

[6] See NIPA table 6.14D, "Inventory Valuation Adjustment to Nonfarm Incomes by Legal Form of Organization and by Industry," available on BEA's website at www.bea.gov.

year.[7] LIFO users also report the LIFO reserve and the LIFO value after adjustment for the reserve. For wholesale and retail trade, data on purchases from the Economic Census are used in the calculation of cost of goods sold and of inventory-turnover ratios. In addition, data on product-line sales by industry are used in the calculation of commodities held in inventory.

For the mining and construction industries, the inventory estimates for benchmark years are based on information from the Economic Census. For the publishing industry, the inventory estimates are based on information from the Service Annual Survey. For all other nonfarm industries, the estimates for all years except the most recent year are based on IRS tabulations of income tax returns for corporations and for sole proprietorships and partnerships.

For farm inventories, the estimates for all years (benchmark and nonbenchmark) are based on USDA annual reports. Annual changes in farm inventories of crops are estimated as crops harvested in the period and available for sale (that is, not including crops retained for personal consumption) less crops sold in the period plus net CCC loan transactions. The annual quantity changes for each crop are valued at average market prices received by farmers during the calendar year. Annual changes in farm inventories of livestock are estimated from USDA surveys of inventory stocks on farms. For each livestock commodity, annual quantity changes are valued at average market price per head.

Nonbenchmark-year estimates

For years other than benchmark years and the most recent year, the inventory estimates for the manufacturing, trade, and publishing industries are primarily based on the Census Bureau's Annual Survey of Manufactures, Annual Wholesale Trade Survey, Annual Retail Trade Survey, and Service Annual Survey. Respondents to these surveys report LIFO, LIFO reserve, and non-LIFO valuations separately. In addition, respondents in the manufacturing sector report information on the distribution of costs among materials, labor, and overhead and those in retail and wholesale report purchases; this information is used in the calculation of cost of goods sold and of inventory-turnover ratios.

For the mining, utilities, and construction industries, as well as for other nonfarm industries, the estimates for all nonbenchmark years except the most recent year are based on IRS tabulations of income tax returns for corporations and for sole proprietorships and partnerships.

[7] The wholesale trade inventory data published by the Census Bureau include inventories that are owned by U.S. establishments but are held abroad. BEA adjusts these wholesale trade data in order to exclude those inventories. The retail trade inventory data published by the Census Bureau exclude inventories that are owned by U.S. establishments but are held abroad.

The sources and methods for deriving the nonbenchmark-year estimates of farm inventories are the same as those for the benchmark estimates (see above).

Most-recent-year and current-quarterly estimates

The seasonally adjusted inventory estimates for the most recent year and for the current quarters for the manufacturing and trade industries (except those for retail auto dealers) are based on the following Census Bureau surveys: Monthly Survey of Manufacturers' Shipments, Inventories, and Orders; Monthly Wholesale Trade Survey; Monthly Retail Trade Survey; and the Census Bureau's monthly Advance Economic Indicators Report.[8] The data for manufacturing, wholesale trade, and retail trade are summarized in the Census Bureau's monthly "Business Sales and Inventories" release. The quarterly estimates for the manufacturing and trade industries are calculated as end-of-month inventories for the final month of the quarter less end-of-month inventories for the final month of the preceding quarter.

For retail auto dealers, seasonally adjusted inventory estimates for the most recent year and for the current quarters are primarily based on a weighted average of BEA's unit-based estimates, which are based on the monthly unit data from *Wards' Automotive Reports*, and of Census Bureau total motor vehicle inventories.

For utilities, the seasonally adjusted quantity estimates are prepared first, using data on changes in the physical stocks of coal, petroleum, and natural gas and on base-year prices from the Energy Information Administration. The current-dollar estimates are then derived by "reflation"—that is, by multiplying the quantity estimates by appropriate price data from the Bureau of Labor Statistics (BLS).

For all other nonfarm industries, seasonally adjusted estimates for the most recent year and for the current quarters are prepared by starting with the previous annual level and by assuming that inventories move proportionately with certain other indicator series chosen for each industry or by judgmental trend. The indicator series include inventory information from the Census Bureau's Quarterly Financial Report and monthly measures of activity from the Census Bureau's construction statistics and from BLS industry wage data.

For seasonally adjusted farm inventories, quarterly estimates of crop inventories, which are calculated only for total crops, are based on a BEA quarterly allocation of USDA annual projections of crop output and cash receipts. Quarterly estimates of livestock inventories are based on USDA data by type of livestock.

[8] The Census Bureau's Advance Economic Indicators Report provides advance statistics for U.S. International Trade in Goods, domestic retail inventories, and domestic wholesale inventories. Advance measures of domestic retail and wholesale inventories were first provided in July 2016; the Census Bureau provides the report to BEA in time for it to be incorporated into its advance estimates of GDP.

The not seasonally adjusted (NSA) estimates of inventories are derived using the same methods as the seasonally adjusted current quarterly estimates, using the not seasonally adjusted versions of the same indicators.

Quantity and price estimates

The quantity estimates for the detailed inventory components are primarily derived by deflation, as shown in appendix B. (For a general description of the deflation method, see "Estimates for detailed components" in chapter 4.)

In the NIPAs, the aggregate measures for most of the components of real GDP are calculated from the detailed components as chain-type quantity and price indexes (see "Estimates for NIPA aggregates" in chapter 4). However, the detailed CIPI estimates may contain negative values (which could require the Fisher formula to take the square root of a negative number).[9] Therefore, the end-of period, chain-weighted estimates of inventory stocks are calculated first, and the CIPI chained-dollar estimates are then calculated as the differences between these estimates. Under this procedure, inventory stocks are used as weights for inventory flows, though the composition of the stocks may differ from the composition of the inventory investment flows.

[9] The inability to calculate Fisher quantity indexes for CIPI does not extend to higher level aggregates (such as gross private domestic investment and GDP) that include CIPI as a component, because the negative values of CIPI are small relative to the levels of the other components of those aggregates.

Table 7.A—Summary of Methodology Used to Prepare Estimates of Change in Private Inventories

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
2	Farm	USDA change in inventories adjusted to exclude Commodity Credit Corporation (CCC) forfeitures and to include net CCC loans at market value.	Same as for benchmark year.	Same as for benchmark year.	Crops: BEA quarterly allocations of USDA annual projections of crop output and cash receipts. Livestock: USDA quarterly data.	USDA average market prices.
3	Mining, utilities, and construction:					
	Mining	Inventories from EC, revalued to current replacement cost using EC information on accounting methods, commodity composition, and turnover and using information on prices, primarily PPIs.	Inventories from IRS tabulations of business tax returns, revalued to current replacement cost based on IRS LIFO valuation proportions and turnover and using information on prices, primarily PPIs.	Census Bureau Quarterly Financial Report survey of mining corporations, revalued as in nonbenchmark years	For third and second estimates, same as for most recent year; for advance estimate, judgmental trend.	PPI for coal mining, PPI for nonmetallic mineral mining and quarrying, PPI for metal ore mining, PPI for oil and gas extraction, PPI for petroleum refinery primary products, PPI for parts and attachments for mining, machinery, and equipment, and PPI for mining machinery and equipment.
	Utilities	Inventories from IRS tabulations of business tax returns, revalued to current replacement cost based on IRS LIFO valuation proportions and turnover and using information on prices, primarily PPIs.	Same as for benchmark year.	Monthly physical quantities and base-year prices from Energy Information Administration (EIA) combined with PPIs for electric utilities.	Same as for most recent year.	For annual except most recent year, deflation using PPI for coal, PPI for natural gas, and PPI for heavy fuel oils; for most recent year and current quarterly, direct valuation, using quantities and prices of stocks of coal, petroleum, and natural gas from EIA.
	Construction	Inventories from EC, revalued to current replacement cost using IRS information on accounting methods and	Inventories from IRS tabulations of business tax returns, revalued to current replacement cost based on IRS LIFO	Judgmental trend.	Same as for most recent year.	PPI for construction materials.

Table 7.A—Summary of Methodology Used to Prepare Estimates of Change in Private Inventories

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
		EC information on turnover and using information on prices, primarily PPIs.	valuation proportions and turnover and using information on prices, primarily PPIs.			
4	Manufacturing:					
5	Durable goods industries	Inventories from EC, revalued to current replacement cost using EC information on accounting methods, commodity composition, and turnover and using information on prices, primarily PPIs and BEA unit labor costs.	Inventories from ASM, revalued to current replacement cost based on ASM LIFO proportions and turnover and using information on prices, primarily PPIs and BEA unit labor costs.	Inventories from Census Bureau Monthly Surveys of Manufacturers' Shipments, Inventories, and Orders, revalued as in nonbenchmark years.	For second and third estimates, same as most recent year; for advance estimate, 1st and 2nd month of quarter same as most recent year; 3rd month based on Census Bureau's Advance Durable Goods Report. .	Various PPIs.
6	Nondurables goods industries	Inventories from EC, revalued to current replacement cost using EC information on accounting methods, commodity composition, and turnover and using information on prices, primarily PPIs and BEA unit labor costs.	Inventories from ASM, revalued to current replacement cost based on ASM LIFO proportions and turnover and using information on prices, primarily PPIs and BEA unit labor costs.	Inventories from Census Bureau Monthly Surveys of Manufacturers' Shipments, Inventories, and Orders, revalued as in nonbenchmark years	Crude petroleum: for second and third estimates, composite refiner crude acquisition cost from Energy Information Administration; for advance estimate, composite refiner acquisition cost for two months and PPI for crude petroleum for the most recent month. Other components: For second and third estimates, same as most recent year. For advance estimate, 1st and 2nd month of quarter same as most recent year; 3rd month based on judgmental trend.	Crude petroleum: composite refiner acquisition cost from Energy Information Administration. Other components: various PPIs.

Table 7.A—Summary of Methodology Used to Prepare Estimates of Change in Private Inventories

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
7	Wholesale trade:					
8	Durable goods industries	Inventories from EC and AWTS, revalued to current replacement cost using EC information on accounting methods, commodity composition, and turnover and using information on prices, primarily PPIs and IPIs.	Inventories from AWTS, revalued to current replacement cost based on AWTS LIFO proportions and turnover and using information on prices, primarily PPIs and IPIs.	Merchant wholesale: inventories from MWTS, revalued as in nonbenchmark years. Nonmerchant wholesale: estimated CIPI based on manufacturing finished goods CIPI and on judgmental trend.	Merchant wholesale: second and third estimates, same as most recent year; for advance estimate, 1st and 2nd month of quarter same as most recent year; 3rd month based on Census Bureau's monthly Advance Economic Indicators Report. Nonmerchant wholesale: Same as most recent year.	Various PPIs and IPIs.
9	Nondurable goods industries	Inventories from EC and AWTS, revalued to current replacement cost using EC information on accounting methods, commodity composition, and turnover and using information on prices, primarily PPIs and IPIs.	Inventories from AWTS, revalued to current replacement cost based on AWTS LIFO proportions and turnover and using information on prices, primarily PPIs and IPIs.	Merchant wholesale: inventories from MWTS, revalued as in nonbenchmark years. Nonmerchant wholesale: estimated CIPI based on manufacturing finished goods CIPI and on judgmental trend.	Merchant wholesale: For second and third estimates, same as most recent year; for advance estimate, 1st and 2nd month of quarter same as most recent year; 3rd month based on Census Bureau's monthly Advance Economic Indicators Report. Nonmerchant wholesale: Same as for most recent year.	Various PPIs and IPIs.
10	Retail trade:					
11	Motor vehicle and parts dealers	Inventories from ARTS, revalued to current replacement cost using ARTS information on accounting methods and turnover, EC information on commodity composition, and using	Inventories from ARTS, revalued to current replacement cost based on ARTS LIFO proportions and turnover and using information on prices, primarily PPIs and IPIs.	New motor vehicles: weighted average of BEA unit-based motor vehicle estimates and of inventories from MRTS, revalued as in nonbenchmark years. Other components: inventories from MRTS,	New motor vehicles: For second and third estimate, same as most recent year; for advance estimate, 1st and 2nd month of quarter same as most recent year; 3rd month based on BEA unit-based motor vehicle inventories and inventories from Census	New motor vehicles: PPI for new autos, PPI for light trucks, PPI for parts, IPI for new autos and light trucks, and CPI for used motor vehicles. Other components: PPI for boats, PPI for motor cycles, PPI for RVs, PPI for other transportation equipment, PPI

Table 7.A—Summary of Methodology Used to Prepare Estimates of Change in Private Inventories

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
		information on prices, primarily PPIs and IPIs.		revalued as in nonbenchmark years.	Bureau's monthly Advance Economic Indicators Report. Other components: For second and third estimate, same as most recent year; for advance estimate, 1st and 2nd month of quarter same as most recent year; 3rd third month based on inventories from Census Bureau's monthly Advance Economic Indicators Report.	for parts and accessories, IPI for parts and accessories, and IPI other transportation equipment.
12	Food and beverage stores	Inventories from ARTS, revalued to current replacement cost using ARTS information on accounting methods and turnover, EC information on commodity composition, and using information on prices, primarily PPIs and IPIs.	Inventories from ARTS, revalued to current replacement cost based on ARTS LIFO proportions and turnover and using information on prices, primarily PPIs and IPIs.	Inventories from MRTS, revalued as in nonbenchmark years.	For second and third estimate, same as benchmark year; for advance estimate, 1st and 2nd month of quarter same as most recent year; 3rd third month based on Census Bureau's monthly Advance Economic Indicators Report.	Various PPIs and IPIs.
13	General merchandise stores	Inventories from ARTS, revalued to current replacement cost using ARTS information on accounting methods and turnover, EC information on commodity composition, and using information on prices, primarily PPIs and IPIs.	Inventories from ARTS, revalued to current replacement cost based on ARTS LIFO proportions and turnover and using information on prices, primarily PPIs and IPIs.	Inventories from MRTS, revalued as in nonbenchmark years.	For second and third estimate, same as benchmark year; for advance estimate, 1st and 2nd month of quarter same as most recent year; 3rd month based on Census Bureau's monthly Advance Economic Indicators Report.	Various PPIs and IPIs.

Table 7.A—Summary of Methodology Used to Prepare Estimates of Change in Private Inventories

Line in NIPA table group 5.6	Component	Current-dollar estimates				Quantity and price estimates (quantity estimate prepared by deflating with the price index unless otherwise indicated)
		Benchmark year	Indicator series used to interpolate and extrapolate*			
			Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates	
14	Other retail stores	Inventories from ARTS, revalued to current replacement cost using ARTS information on accounting methods and turnover, EC information on commodity composition, and using information on prices, primarily PPIs and IPIs.	Inventories from ARTS, revalued to current replacement cost based on ARTS LIFO proportions and turnover and using information on prices, primarily PPIs and IPIs.	Inventories from MRTS, revalued as in nonbenchmark years.	For second and third estimate, same as benchmark year; for advance estimate, 1st and 2nd month of quarter same as most recent year; 3rd month based on Census Bureau's monthly Advance Economic Indicators Report.	Various PPIs and IPIs.
15	Other industries:					
	Publishing	Inventories from SAS, revalued to current replacement cost based on IRS LIFO proportions and SAS turnover and using information on prices, primarily PPIs and BEA unit-labor costs.	Same as for benchmark year.	Census Bureau quarterly financial report survey of publishing corporations, revalued as in benchmark years.	For third and second estimates, same as for most recent year; for advance estimate, judgmental trend.	Various PPIs.
	Other components	Inventories from IRS tabulations of business tax returns, revalued to current replacement cost based on IRS LIFO valuation proportions and turnover and using information on prices, primarily PPIs.	Same as for benchmark year.	Judgmental trend.	Judgmental trend.	

*The description “Same as for benchmark year” indicates that the estimate is prepared using a methodology similar to that used for the benchmark estimate rather than by using an indicator series to interpolate or extrapolate the benchmark estimate.

ARTS	Annual Retail Trade Survey, Census Bureau
ASM	Annual Survey of Manufactures, Census Bureau
AWTS	Annual Wholesale Trade Survey, Census Bureau
BLS	Bureau of Labor Statistics
EC	Economic Census, Census Bureau
IPI	Import Price Index, BLS
IRS	Internal Revenue Service
LIFO	Last In, First Out
PPI	Producer Price Index, BLS
MRTS	Monthly Retail Trade Survey, Census Bureau
MWTS	Monthly Wholesale Trade Survey, Census Bureau
SAS	Services Annual Survey, Census Bureau
USDA	U.S. Department of Agriculture

Appendix A: Illustration of LIFO and FIFO Accounting Methods and Their Relationship to NIPA Accounting

This appendix illustrates the basic aspects of last-in-last-out (LIFO) and first-in-first-out (FIFO) inventory accounting and their relationship to NIPA inventory accounting. The illustration is based on one retail establishment that holds only one type of good in inventory. The unit cost and the sales price increase over time, but they are equal to each other in each period, so any profit (or loss) made by the establishment is solely the result of changes in the prices of goods held in inventory.

Exhibit 1 provides information on goods purchased by the establishment in periods 0 to 3; these goods then were sold in that same period or were added to inventory. It also provides information on goods sold by the establishment in periods 1 to 3; these goods were purchased in that same period or were withdrawn from the inventory of goods that were purchased in earlier periods.

Exhibit 1—Purchases and Sales

	Purchases			Sales		
Period	Quantity	Unit cost	Book value	Quantity	Price	Revenue
0	100	$1	$100	…..	…..	…..
1	10	$2	$20	10	$2	$20
2	10	$3	$30	5	$3	$15
3	10	$4	$40	20	$4	$80

Exhibit 2 presents the LIFO-accounting treatment for the cost of goods sold (COGS), the book value of inventories, and the resulting measure of profit for the establishment.

Exhibit 2—Inventory Accounting on a LIFO Basis

Period	Book value at beginning of period	Purchases	Cost of goods sold (COGS)	Quantity in inventory	Book value at end of period	Change in book value	Recorded profit (revenue minus COGS)
0	$0	$100	$0	100	$100	…..	…..
1	$100	$20	$20	100	$100	0	$0
2	$100	$30	$15	105	$115	$15	$0
3	$115	$40	$60	95	$95	–$20	$20

- In period 1, the beginning inventory consists of 100 units at $1 each = $100; 10 units are sold at $2 each = $20; under LIFO, these 10 units are the most recent goods acquired, so COGS is 10 units at $2 each = $20; recorded profit is $20 – $20 = $0; and inventory at end of period 1 (and at beginning of period 2) consists of 100 units at $1 each = $100.
- In period 2, 5 units are sold at $3 each = $15; COGS is 5 units at $3 each = $15; recorded profit is $15 – $15 = $0; and inventory at end of period 2 (and at beginning of period 3) consists of 100 units at $1 each + 5 units at $3 each = $115.
- In period 3, 20 units are sold at $4 each = $80; COGS is 10 units at $4 each + 5 units at $3 each + 5 units at $1 each = $60; recorded profit is $80 – $60 = $20; and inventory at end of period 3 consists of 95 units at $1 each = $95.

Exhibit 3 presents the FIFO-accounting treatment for the COGS and the book value of inventories for the establishment.

Exhibit 3—Inventory Accounting on a FIFO basis

Period	Book value at beginning of period	Purchases	Cost of goods sold (COGS)	Quantity in inventory	Book value at end of period	Change in book value	Recorded profit (revenue minus COGS)
0	$0	$100	$0	100	$100	…..	…..
1	$100	$20	$10	100	$110	$10	$10
2	$110	$30	$5	105	$135	$25	$10
3	$135	$40	$20	95	$155	$20	$60

- In period 1, the beginning inventory consists of 100 units at $1 each = $100; 10 units are sold at $2 each = $20; under FIFO, these 10 units are the earliest goods acquired, so COGS is 10 units at $1 each = $10; recorded profit is $20 – $10 = $10; and inventory at end of period 1 (and at beginning of period 2) consists of 90 units at $1 each + 10 units at $2 each = $110.
- In period 2, 5 units are sold at $3 each = $15; COGS is 5 units at $1 each = $5; recorded profit is $15 – $5 = $10; and inventory at end of period 2 (and at beginning of period 3) consists of 85 units at $1 each + 10 units at $2 each + 10 units at $3 each = $135.
- In period 3, 20 units are sold at $4 each = $80; COGS is 20 units at $1 each = $20; recorded profit is $80 – $20 = $60; and inventory at end of period 3 consists of 65 units at $1 each + 10 units at $2 each + 10 units at $3 each + 10 units at $4 each = $155.

Exhibit 4 illustrates the concepts that the NIPAs attempt to capture in inventory accounting. The change in private inventories (CIPI) in each period is equal to the change in the quantity of inventory times the current price in that period. The inventory valuation

adjustment (IVA) is equal to CIPI minus the change in the book value of inventory. Note that when prices are rising from period to period, as in this illustration, the FIFO IVA is negative. Note also that when inventories are unchanged or increasing from period to period, the LIFO IVA is equal to $0, and when prices are rising and inventories are decreasing, the LIFO IVA is negative.

Exhibit 4—NIPA Accounting Concept

Period	Quantity in inventory	Change in quantity in inventory	Price	Change in private inventories	Inventory valuation adjustment (LIFO basis)	Inventory valuation adjustment (FIFO basis)
0	100	…..	…..	…..	…..	…..
1	100	0	$2	0	$0	–$10
2	105	5	$3	$15	$0	–$10
3	95	–10	$4	–$40	–$20	–$60

- In period 1, the quantity of goods held in inventory is unchanged, so CIPI is $0. Under LIFO, the change in the book value is $0, and the LIFO IVA is $0 (see exhibit 2). Under FIFO, the change in the book value is $10, and the FIFO IVA is $0 – $10 = –$10 (see exhibit 3).

- In period 2, the quantity of goods held in inventory increases by 5 units, and the price is $3 per unit, so CIPI is $15. Under LIFO, the change in the book value is $15, and the LIFO IVA is $15 – $15 = $0. Under FIFO, the change in the book value is $25, and the FIFO IVA is $15 – $25 = –$10.

- In period 3, the quantity of goods held in inventory decreases by 10 units, and the price per unit is $4, so CIPI –$40. Under LIFO, the change in the book value is –$20, and the LIFO IVA is –$40 – (–$20) = –$20. Under FIFO, the change in the book value is $20, and the FIFO IVA is –$40 – $20 = –$60.

For the purposes of this illustration, information on physical quantities and on prices is provided for the individual good held in inventory. However, data on the physical quantities of goods moving through inventory are generally not available, and the NIPA estimates are derived using data on book values from the Census Bureau or from the IRS. For an illustration of the actual method used in accounting for inventories in the NIPAs, see appendix B.

Appendix B: Illustration of NIPA Inventory Calculations

This appendix illustrates the basic steps in preparing end-of-quarter inventory estimates for an industry using the following assumptions.

- Last-in, first-out (LIFO) and first-in, first-out (FIFO) are the only accounting methods used in this industry.
- The Census Bureau published value of non-LIFO inventories (that is, the value of inventories without using LIFO accounting) for this industry is $110 in May and $130 in June.
- The percentage of inventories for this industry that are accounted for on a LIFO basis is 10 percent, and the LIFO reserve (the adjustment that converts a LIFO valuation to a non-LIFO valuation) is $10.
- The FIFO turnover ratio (ending inventory divided by monthly cost of goods sold), which is used in deriving the turnover period and the turnover pattern for this industry, is 1.4. The turnover period (the average time a good is held in inventory), which is used in deriving the monthly cost index, is 4 months. The turnover pattern (the pattern of how goods are withdrawn from inventory), is also used in deriving the monthly cost index. The pattern, starting with the most recent month, is 0.23, 0.62, 0.14, and 0.01.
- The inventory composition for this industry is 40 percent of commodity A and 60 percent of commodity B. The monthly producer price indexes (PPIs) for each of these commodities are shown in the first two columns of exhibit 2.

Step 1: Separating Census Bureau published inventories into those that were reported on a LIFO basis and those that were reported using other accounting methods

Exhibit 1

Time period	Census Bureau non-LIFO inventories	LIFO reserve	Book value of inventories	LIFO inventories	FIFO inventories
May	110	10	100	10	90
June	130	10	120	12	108

Book value of inventories. Calculated as Census Bureau non-LIFO inventories minus LIFO reserve: for June, $130 – $10 = $120. Of this $120, $12 is valued on a LIFO-accounting basis ($120 x 0.10), and the remaining $108 is valued on a non-LIFO (FIFO) accounting basis.

Step 2: Construction of current-period inventory price indexes for each industry, and for manufacturing and publishing, each stage of fabrication

Exhibit 2

Time period	PPI for com-modity A	PPI for com-modity B	Monthly price index	End-of-month price index	Average monthly price index	Monthly cost index
January	108.0	109.0	108.6	109.3	….	
February	110.0	110.0	110.0	111.3	110.30	
March	115.0	111.0	112.6	113.6	112.45	
April	120.0	111.0	114.6	115.3	114.45	
May	122.0	112.0	116.0	117.9	116.60	114.623
June	130.0	113.0	119.8	120.8	119.35	116.880
July	132.0	115.0	121.8	….	….	

Monthly price index. Calculated as the weighted average of the commodity PPIs: for June, (130.0 x 0.4) + (113.0 x 0.6) = 119.8.[10]

End-of-month price index. Calculated as a 2-month forward moving average of the monthly price index: for June, (119.8 + 121.8) / 2 = 120.8.

Average monthly price index. Calculated as a 2-month average of the end-of-month price index: for June, (117.9 + 120.8) / 2 = 119.35.

Step 3: Construction of monthly cost indexes for each industry, and for manufacturing and publishing, each stage of fabrication

Monthly cost index (acquisition cost). Calculated as the average of the monthly price indexes for the turnover period weighted by the turnover pattern: for June, (112.45 x 0.01) + (114.45 x 0.14) + (116.60 x 0.62) + (119.35 x 0.23) = 116.880.[11]

[10] In the NIPA calculations, industry-based PPIs rather than commodity-based PPIs are used for some industries. In calculating the average price at the detailed industry level, BEA applies a fixed-weight aggregation structure, based on weights from the economic censuses, when combining specific commodities held within an industry rather than a Fisher aggregation.

[11] This illustrated calculation is that used under FIFO accounting. BEA has a specific methodology for constructing the cost indexes under each of the inventory-accounting methods.

Step 4: Revaluation of the book-value inventories to yield constant-dollar and current-dollar change in inventories

Exhibit 3

Time period	Current-dollar change in inventories	Constant-dollar change in inventories	Change in book value of inventories	IVA	Constant-dollar stocks	Current-dollar stocks
June	18.57	15.56	20	–1.43	95.56	115.44

Change in FIFO inventories. Constant-dollar change is calculated as the difference between the FIFO book values for each month deflated by the monthly cost index: for June, ($108 / 1.16880) – ($90 / 1.14623) = $13.88. Current-dollar change is then calculated by reflating the constant-dollar change using the average monthly price index: for June, $13.88 x 1.1935 = $16.57.

Change in LIFO inventories. Because LIFO inventories increased from May to June, current-dollar change is equal to change in LIFO book value: for June, $2.00 (see appendix A). Constant-dollar change is calculated by deflating the change in LIFO book value by the average monthly price index: for June, ($2.00 / 1.1935) = $1.68.

Current-dollar change in inventories. Calculated as the sum of the current-dollar change in FIFO inventories and the current-dollar change in LIFO inventories: for June, $16.57 + $2.00 = $18.57.

Constant-dollar change in inventories. Calculated as the sum of the constant-dollar change in FIFO inventories and the constant-dollar change in LIFO inventories: for June, $13.88 + $1.68 = $15.56.

Step 5: Calculation of the Inventory Valuation Adjustment (IVA)

Change in the book value of inventories. Calculated as the difference in the Census Bureau non-LIFO inventory levels: for June, $130 – $110 = $20.

IVA. Calculated as the difference between current-dollar change in inventories and change in the book value of inventories: for June, $18.57 – $20.00 = –$1.43. (Note that because LIFO inventories increased during this period, the IVA for the LIFO portion of inventory change is $0, and the IVA for the FIFO portion is $16.57 – $18.00 = –$1.43.)

Step 6: Calculation of current-dollar and constant-dollar stocks

Constant-dollar stocks. Calculated by adding constant-dollar change in inventories to the previous month's constant-dollar stock: assuming a constant-dollar inventory level of $80 for May, the constant-dollar stock of inventories for June is $80 + $15.56 = $95.56.

Current-dollar stocks. Calculated by reflating constant-dollar stocks using end-of-month prices: for June, $95.56 x 1.208 = $115.44.

Note that while the difference between the constant-dollar stocks for May and June ($15.56) is equal to constant-dollar CIPI,[12] the difference between the current-dollar stocks for May and June ($19.88) is not equal to current-dollar CIPI ($18.57). This is because the current-dollar stocks are valued at end-of-period prices, while CIPI is valued using average prices for the period.

[12] Because quarterly and monthly estimates in the NIPAs are expressed at annual rates, it is necessary to divide the CIPI estimates by 4 and by 12, respectively, to observe the equality.

CHAPTER 8: NET EXPORTS OF GOODS AND SERVICES

(Updated: December 2020)

Definitions and Concepts
Recording in the NIPAs
Overview of Source Data and Estimating Methods
- Benchmark-year and nonbenchmark-year estimates
- Current quarterly estimates
- Adjustments and other differences between the NIPA and ITA estimates
- Quantity and price estimates

Table 8.A—Summary of Methodology for Exports of Goods and Services
Table 8.B—Summary of Methodology for Imports of Goods and Services

Net exports of goods and services is the difference between U.S. exports of goods and services and U.S. imports of goods and services. Exports measures the portion of total U.S. production of goods and services—gross domestic product (GDP)—that is provided to the rest of the world; thus, movements in exports reflect changes in foreign demand for U.S.-produced goods and services. Imports measures the portion of total U.S. expenditures—gross domestic purchases—that is accounted for by goods and services provided by the rest of the world; thus, movements in imports reflect changes in domestic demand for foreign-produced goods and services. The impact of imports on the U.S. economy depends on the degree to which they act as substitutes for, or as complements to, domestic production.

Together, the two measures reflect the extent to which the United States participates in the global marketplace, which provides broad opportunities for specialization and other economic efficiencies. As the difference between the two, net exports represents the gap between U.S. domestic production and U.S. domestic demand and the extent to which a surplus or deficit of domestic production relative to domestic demand is addressed by foreign markets.

Net exports in the national income and product accounts (NIPAs) corresponds to the measure "balance on goods and services"—commonly referred to as the "trade deficit" (when imports exceeds exports) or the "trade surplus" (when exports exceeds imports)—in the international transactions (or balance of payments) accounts (ITAs), also produced by BEA.[1] The two measures are very similar, but they differ in coverage, definitions, and in timing of revisions (see the section "Adjustments and other differences between the NIPA and ITA estimates). Net exports is also a component of the "balance on current account," a measure in both the ITAs and the NIPAs that also includes receipts and payments of income and receipts and payments of current taxes, contributions for government social insurance, and transfers.

[1] For a detailed description of the ITAs, see "U.S. International Economic Accounts: Concepts and Methods" available on BEA's website at www.bea.gov.

Net exports also relates GDP to other important aggregates in the NIPAs. GDP less net exports is equal to gross domestic purchases, which is the market value of goods and services purchased by U.S. residents regardless of where those goods and services are produced. Final sales of domestic product (worldwide final sales of U.S. production) less net exports is equal to final sales to domestic purchasers, which is the market value of final goods and services purchased by U.S. residents regardless of where those goods and services are produced.

Net exports is also used in preparing two alternative measures of U.S. production—*command-basis GDP* and *command-basis gross national product (GNP)*—that provide information on the real purchasing power of the income generated by U.S. production of goods and services.[2] These measures reflect the impact of changes in the terms of trade and of changes in production on the purchasing power associated with the nation's output. More specifically, these measures deflate exports and imports of goods and services (and, in the case of command-basis GNP, also income receipts and payments) by the price index for gross domestic purchases (which measures the prices of goods and services purchased by U.S. residents). Thus, the command-basis measures reflect the prices of *purchased* goods and services, while real GDP and real GNP reflect the prices of *produced* goods and services. Other related measures include the *trading gains index*, which is measured as the ratio of the GDP price index to the price index for gross domestic purchases, and the *terms of trade index*, which is measured as the ratio of the price index for exports of goods and services to the price index for imports of goods and services.[3]

Definitions and Concepts

The estimates of net exports are an integral part of the NIPAs, a set of accounts that provides a logical and consistent framework for presenting statistics on U.S. economic activity (see "Chapter 2: Fundamental Concepts"). As discussed in chapter 2, net exports is one of the final expenditures components of GDP. It is equal to *exports*, which measures *all goods and services* sold, given away, or otherwise transferred by *residents of the United States* to *foreign residents (also referred to as nonresidents or the rest of the world)* less *imports,* an offsetting component of GDP that measures all goods and services sold, given away, or otherwise transferred by foreign residents to U.S. residents.

The inclusion of exports as a component of GDP is straightforward; as explained in chapter 2, in the final expenditures approach, GDP is measured by summing the final expenditures of persons, businesses, governments, *and foreigners* for goods and services

[2] GDP measures the value of goods and services produced by labor and property located in the United States, while GNP measures the value of goods and services produced by labor and property supplied by U.S. residents. GNP is equal to GDP less net income payments to the rest of the world. BEA also prepares alternative command-basis measures of net national product and of net domestic product.
[3] For more information, see the section "Principal quantity and price measures" in chapter 2 of this handbook.

produced in the United States. Because exports to foreign residents represent the endpoint of domestic production, they include goods and services intended for intermediate as well as final use; any further processing that occurs outside of the United States is foreign production and is not included in GDP. For example, automotive parts that are produced in the United States and shipped to a final assembly plant in Canada are included in U.S. exports and counted as final expenditures in GDP.

The inclusion of imports as an offsetting entry in deriving GDP and the inclusion of intermediate goods and services in imports warrant further explanation. Imports represent production that has occurred outside the United States, and thus they are not included in GDP. However, purchases of imported goods and services, as well as purchases of domestic goods and services, are included in personal consumption expenditures (PCE), gross private domestic investment, and government consumption expenditures and gross investment so that these final expenditure components of GDP will accurately reflect the aggregate demand of persons, businesses, and governments for goods and services wherever they are produced.[4] Thus, imports is included in the calculation of GDP as a counter-entry that offsets the non-U.S. production that is included in these final expenditures components. For example, a U.S. consumer may purchase an automobile (a final good) that is produced in the United States or in a foreign country. In either case, the purchase is recorded in PCE (a positive entry in deriving GDP); however, in the case of a foreign automobile, the purchase is offset in U.S. imports (a negative entry in deriving GDP).[5] Similarly, a domestic automobile manufacturer may purchase steel (an intermediate good) from either a domestic or a foreign manufacturer; the steel is either used in the production process and included in the value of the final product (and therefore GDP) during that period, or it is added to the manufacturer's inventory of materials and supplies (also a positive entry in deriving GDP).[6] The domestically produced steel reflects value added that contributes to GDP; in contrast, the foreign-produced steel reflects value added that does not reflect U.S. production and that is offset by the recording of imports of steel (a negative entry in deriving GDP).

Residents of the United States—as defined in both the NIPAs and the ITAs—are (1) individuals residing permanently in the United States, (2) business enterprises and nonprofit organizations established under U.S. laws, including corporations, partnerships,

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[4] Additionally, the source data for estimating these final expenditures components do not, for the most part, distinguish between domestically produced and foreign-produced goods and services.

[5] Another example is the payments by U.S. residents to foreign residents for travel services. These expenditures are included in PCE collectively as "Foreign travel by U.S. residents" in the category "Net foreign travel"; unlike other expenditures on imports, they are not distributed among the individual PCE categories. They are also recorded as imports of goods and services; thus, the PCE and import entries cancel out in deriving GDP. For the results of research aimed at better separating spending by nonresidents from spending by U.S. residents in the detailed PCE statistics, see Michael Armah and Teresita Teensma, "Research Spotlight: Estimates of Categories of Personal Consumption Expenditures Adjusted for Net Foreign Travel Spending," *Survey of Current Business* 92 (April 2012): 13–21.

[6] The NIPA accounting for change in private inventories ensures that the value added at each stage of domestic production—including production of intermediate goods—is included in GDP in the period in which it occurs without being double-counted as further processing occurs (see the box "Simple Example of CIPI Role in Calculating GDP" "Chapter 7: Change in Private Inventories" of this handbook).

and proprietorships, and (3) U.S. federal, state, and local governments, together with their subdivisions. Individuals who reside or expect to reside in the United States for 1 year or more are considered U.S. residents. An exception is made for U.S. students who study abroad and foreign students who study in the United States; students retain the residency of their home country regardless of their length of stay. U.S. government employees stationed abroad (and their families) such as diplomats, consular officials, and members of the armed forces are also considered U.S. residents, regardless of their length of stay abroad.

Affiliates of multinational corporations are considered residents of the country in which they are located, not residents of the country of the parent; thus, U.S. affiliates of foreign corporations are considered U.S. residents, and foreign affiliates of U.S. corporations are considered foreign residents. Economic activities of production and consumption occur predominately in the countries in which the affiliates are located.[7]

Federal, state, and local governments and their agencies and subdivisions are considered residents of their home country. U.S. government installations abroad are considered residents of the United States, and foreign government installations in the United States are considered residents of their home country. International organizations such as the United Nations, the International Monetary Fund, and the International Bank for Reconstruction and Development are considered residents of an international area beyond national boundaries, rather than residents of the country in which they are located or in which they operate.

Foreign residents—as defined in both the NIPAs and the ITAs—are (1) individuals residing permanently outside of the United States, (2) business enterprises and nonprofit organizations established under the laws of foreign nations, (3) foreign governments, together with their subdivisions, and (4) international organizations located in the United States. Thus, for example, U.S. nationals who reside outside of the United States for more than 1 year (with the exception of U.S. students and U.S. government employees) and foreign affiliates of U.S. companies are considered foreign residents. In the NIPAs, the *"rest of the world"* sector consists of foreign residents who are transactors with U.S. residents.

The definition of residency impacts the NIPAs and the ITAs differently because the geographic boundary of the United States differs between the two sets of accounts. In

[7] The measure of net exports presented in the NIPAs is referred to in the ITAs as the "cross-border" measure of international transactions. The cross-border measure is an important indicator of U.S. performance in foreign markets; it reflects the net value of the transactions in goods and services between U.S. residents (including companies) and foreign residents.

In addition, BEA annually provides a supplemental, "ownership-based" framework of the current-account portion of the ITAs in which net receipts resulting from sales by affiliates of U.S. and of foreign companies are combined with the "cross-border" measures of exports and imports to provide an indicator of the net effect of United States-foreign commerce on the U.S. economy. This alternative framework, which is usually published in the January issue of the *Survey of Current Business*, recognizes that both cross-border trade and sales through affiliates represent methods of active participation in the international markets for goods and services.

the NIPAs, the *domestic economy of the United States* encompasses the 50 states, the District of Columbia, and U.S. military installations, embassies, and consulates abroad; Puerto Rico and other islands in the Pacific Ocean and the Caribbean Sea that are designated as commonwealths or territories of the United States are excluded. That is, the NIPAs treat U.S. commonwealths and territories as part of the rest of the world, so the flows of goods and services between them and the United States are included in exports and imports. In the ITAs, U.S. commonwealths and territories are included as part of the domestic economy; the flows of goods and services between them and the United States are excluded from exports and imports, but the flows of goods and services between them and the rest of the world are included in exports and imports.[8]

Table 8.1 shows the types of transactions that are included in, and excluded from, exports and imports in the NIPAs.

Table 8.1—Content of Net Exports

Category of expenditure	Comments
Exports of goods	With the exception of certain items noted below, includes all new and used goods sold, given away, or otherwise transferred from U.S. residents to foreign residents, valued at the transactions—or market—price at the customs boundaries of the United States. Includes one service—electrical energy—in accordance with the recommendation of the Balance of Payments and International Investment Position Manual (BPM6). Excludes certain goods that are classified as services exports: goods purchased and used in the United States by foreign travelers and students; supplies purchased by foreign air and ocean carriers at U.S. ports except fuel and certain nonmilitary goods delivered by military and civilian agencies of the U.S. government to nonresidents in the United States or delivered by U.S. installations abroad to nonresidents. Excludes sales of dwellings and major improvements because ownership implies either real or notional residency. Excludes sales of illegal goods because of insufficient source data on illegal activities.
Exports of services	With the exception of certain items noted below, includes all sales or transfers from U.S. residents to foreign residents of intangible commodities that may be produced, transferred, and consumed at the same time, such as legal services. Includes those goods excluded from exports of goods as noted above. Includes an imputation for financial services furnished without payment by commercial banks and by the Federal Reserve. Excludes electrical energy, as noted above. Excludes sales of illegal services because of a lack of source data on illegal activities.

[8] BEA's long-run goal is to make the geographic coverage in the NIPAs consistent with the treatment in the ITAs. BEA has prepared separate GDP estimates for American Samoa, the Northern Mariana Islands, Guam, and the U.S. Virgin Islands for the years beginning with 2002. Although these estimates are not currently integrated with the GDP estimates for the United States, they represent an important first step toward consistency. For more information, see "States and Territories" on BEA's website at www.bea.gov.

Imports of goods	With the exception of certain items noted below, includes all new and used goods that are sold, given away, or otherwise transferred from foreign residents to U.S. residents, valued at the transactions price paid for merchandise for import into the United States, excluding import duties, freight, insurance, and other charges incurred in bringing the merchandise to the United States. Includes one service—electrical energy—in accordance with the recommendation of BPM6. Excludes certain goods that are classified as services imports: goods purchased and used abroad by U.S. travelers and students; supplies purchased abroad by U.S. air and ocean carriers at foreign ports except fuel; direct defense expenditures abroad for goods, except for petroleum, by U.S. military agencies; and goods purchased by nonmilitary agencies of the U.S. government. Excludes purchases of dwellings and major improvements because ownership is treated as implied residency. Excludes purchases of illegal goods because of insufficient source data on illegal activities.
Imports of services	With the exception of certain items noted below, includes all sales or transfers from foreign residents to U.S. residents of intangible commodities that may be produced, transferred, and consumed at the same time, such as legal services. Includes those goods excluded from imports of goods as noted above. Excludes electrical energy, as noted above. Excludes purchases of illegal services because of insufficient source data on illegal activities.

As noted in the table, exports excludes capital expenditures by foreign residents on structures in the United States. Instead, these expenditures are included in private fixed investment because ownership of a structure in a country signifies a center of economic interest in that country.[9] Likewise, imports excludes capital expenditures by U.S. residents on structures in the rest of the world.[10]

As the NIPAs do not record transactions in financial assets, exports and imports do not include sales to, or purchases from, the rest of the world of financial assets (though the fees associated with these transactions are recorded as services provided).[11] The

[9] A nonresident owner of a dwelling without an economic interest in that country is treated as if he or she has transferred ownership to a hypothetical resident of the country (see the section "Center of Economic Interest" in the 6th edition of the *Balance of Payments and International Investment Position Manual* (BPM6), (Washington, D.C.: International Monetary Fund, 2009), available at http://www.imf.org/external/pubs/ft/bop/2007/bopman6.htm).

[10] The returns to U.S. residents on their investments outside the United States, including investments in structures, less the returns to foreign residents on their investments in the United States, are included in GNP but not in GDP.

[11] However, financial transactions are recorded in BEA's international accounts and in the Federal Reserve Board's financial accounts (formerly called the flow of funds accounts).

NIPAs also do not include illegal goods and services, which are excluded because there are insufficient source data available on illegal activities.[12]

The principal categories of exports and of imports are goods and services. In the NIPAs, goods are classified by type of product into broad categories that reflect the more detailed "end-use" classification system used by the ITAs. The end-use classification system for goods, which consists of 139 export categories and 142 import categories, is based on the principal use rather than the physical characteristics of the merchandise and allows changes in trade to be compared with changes in production, consumption, and income.[13]

Services exports and imports in the NIPAs are generally classified by type of service. However, because of data limitations, certain services are instead classified according to the type of transactors associated with them. Examples include the detailed components of travel services and services that are exported and imported by U.S. military agencies; the latter are classified as exports and imports of "government goods and services, n.e.c."[14]

Exports and imports of services in the NIPAs are each grouped into six broad categories that generally correspond to the aggregate categories used in the ITAs: transport, travel (for all purposes including education), charges for the use of intellectual property n.e.c., other business services, government goods and services n.e.c., and other exports or imports.[15]

Recording in the NIPAs

As described in chapter 2, the NIPAs can be viewed as aggregations of accounts belonging to individual transactors in the economy. In this context, net exports represents the difference between the aggregate demand by all foreign residents for goods and

[12] For more information on the activities that are included in, and excluded from, production and on the exclusion of financial assets in the NIPAs, see the sections "Production boundary" and "Asset boundary" in chapter 2 of this handbook.

[13] The end-use categories used by BEA—such as foods, feeds, and beverages; capital goods; industrial supplies and materials; automotive products; and consumer goods—incorporate the *Harmonized Commodity Description and Coding System* (Brussels: Customs Cooperation Council): 1984. The system was developed under the auspices of the International Customs Cooperation Council to establish an accepted standard for the classification of internationally traded goods.

[14] As part of the 2014 annual update of the NIPAs, a new category, "government goods and services n.e.c." was introduced for both exports and imports. For exports, this component primarily consists of the previously presented category "transfers under U.S. military agency sales contracts." For imports, the component primarily consists of the previously presented category "direct defense expenditures."

[15] The category "Other business services" consists of the following categories that are recorded separately in the ITAs: maintenance and repair services n.i.e., insurance services, financial services, telecommunication, computer, and information services, and "other" other business services. Introduced in the 2020 Annual Update of the ITAs, personal, cultural, and recreational services and construction services are grouped in the NIPA "other other business services" category. See Telles Jr., Martinez, and Peck, "Annual Update of the U.S. International Transactions Accounts," *Survey* 100 (July 2020).

services produced in the United States and the aggregate demand by all U.S. residents for goods and services produced outside the United States.

In the seven summary accounts of the NIPAs, *net* exports of goods and services appears on the right, or credit, side of the Domestic Income and Product Account (account 1) as one of the final expenditures components of GDP. In the Foreign Transactions Current Account (account 5), exports of goods and services appears on the left, or debit, side as the largest component of current receipts from the rest of the world, and imports of goods and services appears on the right, or credit, side as the largest component of current payments to the rest of the world.

Information on exports and imports of goods and services by type of product and by service category is presented in NIPA table group 4.2. Information on the relationship between the NIPAs and the ITAs is shown in table 4.3.

The following is a list of the principal NIPA tables that present estimates of exports and imports:

4.2.1. Percent Change From Preceding Period in Real Exports and in Real Imports of Goods and Services by Type of Product
4.2.2. Contributions to Percent Change in Real Exports and in Real Imports of Goods and Services by Type of Product
4.2.3 Real Exports and Imports of Goods and Services by Type of Product, Quantity Indexes
4.2.4 Price Indexes for Exports and Imports of Goods and Services by Type of Product
4.2.5 Exports and Imports of Goods and Services by Type of Product
4.2.6 Real Exports and Imports of Goods and Services by Type of Product, Chained Dollars
4.3B Relation of Foreign Transactions in the National Income and Product Accounts to the Corresponding Items in the International Transactions Accounts

BEA also prepares estimates of net exports that are not seasonally adjusted; these are available in Section 8 of the NIPA Interactive Data Tables. The tables present nominal, or "current-dollar" measures, "real," or inflation-adjusted measures, and price indexes.

Additionally, BEA prepares "Underlying Detail" tables for the estimates shown in NIPA table groups 4.2 and 4.3.[16]

The NIPAs present information on other international transactions, such as income receipts and payments, movements of capital, and taxes and transfer payments. These transactions are recorded in the Foreign Transactions Current Account (account 5) and in the Foreign Transactions Capital Account (account 7), as well as in NIPA table 4.1.

[16] See "Access Underlying Detail Tables" on BEA's website at www.bea.gov.

The ITAs present information on exports and imports in greater detail than in the NIPAs. For example, ITA table group 2 presents measures of U.S. exports and imports of goods by area and by country, and ITA table group 3 presents measures of exports and imports of more detailed services categories by area and by country.[17]

Overview of Source Data and Estimating Methods

As described earlier in the handbook, most of the NIPA estimates are prepared using a wide variety of source data (see "Chapter 3: Principal Source Data") and using estimating methods that adjust the source data to the required NIPA concepts and that fill in gaps in coverage and timing (see "Chapter 4: Estimating Methods"). Tables 8.A (exports of goods and services) and 8.B (imports of goods and services) at the end of this chapter summarize the source data and estimating methods that are used to prepare the current-dollar benchmark estimates, nonbenchmark annual estimates, and current quarterly estimates, as well as the quantity and price indexes, for the categories of exports and imports shown in NIPA table group 4.2.

The NIPA estimates of exports and imports are primarily based on the ITA estimates of exports and imports, though they also incorporate certain adjustments and other differences that reflect different revision schedules, geographic boundaries, and treatments for certain transactions (see the section "Adjustments and other differences between the NIPA and ITA estimates" below). In turn, the ITA estimates for goods are based primarily on Census Bureau data on trade in goods, and the ITA estimates for services are based primarily on data collected on BEA surveys and on data reported by other U.S. government agencies.[18]

Specifically, the ITA estimates of exports and imports of goods are based primarily on monthly compilations by the Census Bureau of data that are collected by the U.S. Customs and Border Protection, within the U.S. Department of Homeland Security. These data reflect the movement of goods between foreign countries and the United States. They exclude the following: shipments between the United States and its commonwealths and territories; shipments between the United States and its military, diplomatic, and consular installations abroad; shipments of U.S. goods returned to the United States by its Armed Forces; shipments of the personal and household effects of travelers; and shipments of goods that are in transit. The data on goods are valued at the transactions price at the port of exportation, which includes inland freight, insurance, and other charges incurred in placing the goods alongside the carrier. Loading costs and freight charges for transportation of goods beyond the port of exportation are assumed to be paid by the importing country; in the ITAs, these charges are included as exports or imports in "other" transportation services.

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[17] See "Table 2.1 U.S. International Trade in Goods" and "Table 3.1 U.S. International Trade in Services," on BEA's website at www.bea.gov.

[18] For an overview of the source data and estimating methods used in preparing the ITAs, see "U.S. International Economic Accounts: Concepts and Methods" on BEA's website at www.bea.gov.

The ITA estimates of exports and imports of services are based primarily on 10 mandatory BEA "benchmark" and quarterly surveys of international services transactions.[19] These surveys provide information on the receipts and payments for a variety of services and for various types of intangible assets (such as intellectual property). The ITAs also use data from surveys conducted by other U.S. government agencies and mandatory reports submitted to BEA by U.S. government agencies engaged in international transactions. These data are used in deriving estimates of travel, transport, and government goods and services n.e.c. Finally, a variety of published and unpublished source data—including information from U.S. government budgetary documents, from international organizations, from trade associations, and from various other international transactors—are used in deriving certain ITA estimates of services.

Tables 8.A (Exports of Goods and Services) and 8.B (Imports of Goods and Services) following the main text summarize the source data and estimating methods that are used to prepare the current-dollar benchmark, nonbenchmark, and current quarterly estimates and the quantity and price estimates for the categories shown in NIPA table group 4.2. The source data and methods for the current quarterly estimates reflect both seasonally adjusted and not seasonally adjusted estimates unless otherwise noted.

Benchmark-year and nonbenchmark-year estimates

The benchmark and nonbenchmark annual NIPA estimates are derived using essentially the same methodologies. The differences between the benchmark and nonbenchmark annual NIPA estimates relate to the vintage of ITA data used and the number of years for which revisions are incorporated.

Each annual NIPA revision (which generally occurs in July) incorporates on a best-level basis the revised statistics from the most recent annual revision of the ITAs (which generally occurs in June).[20] The time spans of the ITA revisions are not generally limited. However, the annual NIPA revisions are generally limited to the previous 5 years, although the adoption of flexible annual updates in 2010 allows the expansion to additional years if warranted.[21] Therefore, unless the revision period is expanded, the NIPA estimates for earlier years will differ from the ITA estimates by the revisions incorporated into the ITAs but not incorporated into the NIPAs (as well as by the other revisions incorporated into the NIPAs but not into the ITAs). As a result, the NIPA time series of foreign transactions may reflect a discontinuity between the years covered by the NIPA annual update and the preceding years. The discontinuities within the NIPA series and the statistical differences between the NIPAs and the ITAs are generally resolved during benchmark revisions of the NIPAs (which generally occur every 5 years

[19] In this context, "benchmark" refers to the comprehensive nature of the survey and not to the NIPA comprehensive, or "benchmark," revisions.
[20] See "Best level and best change" in "Chapter 4: Estimating Methods" of this handbook.
[21] The revision period for BEA's estimates was expanded from 3 to 5 years as part of the 2018 comprehensive update of the NIPAs. BEA's flexible approach to annual updates is described in "BEA Briefing: Improving BEA's Accounts Through Flexible Annual Revisions," *Survey* 88 (June 2008): 29-32.

and which incorporate revisions as far back as necessary).[22] However, the adjustments and other differences described below will remain, and new differences between the two sets of accounts may be introduced when definitional or statistical changes are implemented in the NIPAs during benchmark revisions that are not fully incorporated into the ITAs. NIPA table 4.3 provides a complete reconciliation of the differences between the NIPAs and the ITAs.

Current quarterly estimates

Monthly statistics on trade in goods, based on Census Bureau compilations of the customs data, and on trade in services, primarily based on BEA surveys and on data reported by other U.S. government agencies, are provided in a Census Bureau-BEA news release.[23]

For seasonally adjusted exports and imports of goods, the "advance" quarterly NIPA estimates are based on Census Bureau trade data for the first 2 months of the quarter and the Census advanced trade report for the 3rd month of the quarter. "Second" quarterly NIPA estimates are based on the Census Bureau data for all three months of the quarter. The "third" quarterly NIPA estimates are based on the quarterly ITAs, which incorporate revised Census Bureau data.[24]

For seasonally adjusted exports and imports of services, the "advance" and "second" quarterly NIPA estimates are largely based on various ITA indicator series that are used to extrapolate from the latest source data. The "third" quarterly NIPA estimates are based on the quarterly ITA estimates, which incorporate data from BEA transportation surveys, extrapolations of BEA survey data on royalties and license fees and "other" private services, and data reported by other U.S. government agencies (and which are used to revise the monthly trade data). The ITA quarterly estimates are incorporated into the NIPA estimates on a "best-change" basis.[25] After the third current quarterly estimate, the NIPA estimates of net exports are not revised again until the next annual update.

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[22] For instance, during the 2013 comprehensive update of the NIPAs, estimates from the most recent annual revision of the ITAs were incorporated into the NIPAs for only the most recent 3 years; the revisions to the ITAs for years back to 1999 were incorporated as part of the 2014 annual update of the NIPAs. The discontinuities in NIPA series are usually presented in the *Survey* with the results of the annual or comprehensive update. For example, see the box, "Discontinuities in NIPA Foreign Transactions" in Stephanie H. McCulla, Alyssa E. Holdren, and Shelly Smith, "Improved Estimates of the National Income and Product Accounts: Results of the 2013 Comprehensive Revision," *Survey* 93 (September 2013): 31.
[23] See "Trade in Goods and Services" on BEA's website at www.bea.gov; select "Data," then "By Topic," and "International Trade & Investment."
[24] For information on BEA's adjustments to the Census data, see the "Explanatory Notes" section of the "U.S. International Trade in Goods and Services" news release, and see ITA table 2.4, available on the "Interactive Data" section of BEA's website at www.bea.gov."
[25] See "Best level and best change" in chapter 4 of this handbook.

The not seasonally adjusted (NSA) estimates of exports and imports are derived using the same methods as the seasonally adjusted estimates, using not seasonally adjusted source data. In addition, the adjustments and other differences that reflect the different release schedules, geographic boundaries, and treatments for certain transactions of the seasonally adjusted NIPA estimates of exports and imports and the seasonally adjusted ITA estimates are also incorporated in the not seasonally adjusted estimates (see the section "Adjustments and other differences between the NIPA and ITA estimates" below).[26]

Adjustments and other differences between the NIPA and ITA estimates

As noted above, the NIPA estimates of exports and imports are equal to the ITA estimates with the exception of certain adjustments and other differences that reflect revision schedules, geographic boundaries, and treatments for certain transactions. These differences, as well as those between the NIPA and ITA estimates of receipts and payments of income and estimates of unilateral transfers, are presented annually in NIPA table 4.3.[27] Table 8.2 below is a subsample of table 4.3B that focuses on the differences associated with exports and imports.

[26] For not seasonally adjusted ITA estimates of trade in goods and services, see "Table 2.1 U.S. International Trade in Goods" and "Table 3.1 U.S. International Trade in Services," available on the "Interactive Data" section of BEA's website at www.bea.gov.

[27] NIPA Table 4.3B is published each year with annual estimates as part of the annual update of the NIPAs. A version of table 4.3B with quarterly estimates is published each month as NIPA table 4.3BU.

Table 8.2— Relation of Exports and Imports in the National Income and Product Accounts to the Corresponding Items in the International Transactions Accounts
(Billions of dollars)

Line in NIPA table 4.3B	Component	2019
1	**Exports of goods, ITAs**	**1652.4**
2	Less: Gold, ITAs	19.3
3	Less: Statistical differences	0.0
4	Plus: Adjustment for U.S. territories and Puerto Rico	3.6
5	**Equals: Exports of goods, NIPAs**	**1636.7**
6	**Exports of services, ITAs**	**875.8**
7	Less: Statistical differences	0.0
8	Less: Other items	0.8
9	Plus: Adjustment for U.S. territories and Puerto Rico	3.0
10	Plus: Financial services furnished without payment	---
11	**Equals: Exports of services, NIPAs**	**878.0**
21	**Imports of goods, ITAs**	**2516.8**
22	Less: Gold, ITAs	12.0
23	Less: Statistical differences	0.0
24	Plus: Gold, NIPAs	-6.4
25	Plus: Adjustment for U.S. territories and Puerto Rico	27.2
26	**Equals: Imports of goods, NIPAs**	**2525.6**
27	**Imports of services, ITAs**	**588.4**
28	Less: Statistical differences	0.0
29	Plus: Adjustment for U.S. territories and Puerto Rico	11.2
30	**Equals: Imports of services, NIPAs**	**599.6**

The principal adjustments and other differences between the NIPA and ITA estimates are described in the following paragraphs.

Adjustment of gold (lines 2, 22, and 24). Gold is used for two purposes: for industrial demand (as an input into the production of goods and services, such as jewelry, watches, and electronic equipment) and for investment (as a store of wealth and a hedge against inflation). In the NIPAs, all domestic production of gold, regardless of its final use, is included in GDP. However, the NIPAs do not treat transactions in valuables, such as gold, as investments in fixed assets, and so investments in gold (other than gold held in industrial inventories) are not reflected in gross domestic purchases (PCE, gross private domestic investment, and government consumption expenditures and gross

investment).[28] For example, if households purchase gold as a form of investment, including that purchase in PCE would distort the analysis of consumption and saving. In contrast, in the international guidelines presented in the System of Accounts 2008 (SNA), the capital account includes the net acquisition of gold and similar valuables (such as antiques and other art objects) that are held as stores of value in gross fixed capital formation as "Acquisitions less disposals of valuables."

Only a small share of the international transactions in nonmonetary gold recorded in the ITAs is for business or industrial use; most transactions are for investment or other purposes. Consequently, the NIPA estimates for exports and imports of nonmonetary gold are not based on the ITA estimates. Instead, the NIPAs incorporate a special adjustment for transactions in gold.

The NIPA estimates for gold begin with an estimate of domestic production of gold, which is included in GDP and in the associated gross domestic income for gold. Domestic gold production is measured as the sum of mine production of gold and of secondary production of gold in the United States multiplied by the average price of gold.[29] Annual estimates of gold production are based on data provided by the Gold Fields Mineral Survey (GFMS), and quarterly estimates are based on data provided by the U.S. Geological Survey's *Mineral Industry Surveys—Precious Metals.* The average price of gold is based on the producer price index for metal ore mining from the Bureau of Labor Statistics (BLS).

Part of domestic gold production is for domestic industrial use (that is, business transactions in gold used for production of final goods, such as jewelry, specialty coins, and medals and for electronics and dental applications). Annual and quarterly estimates of industrial demand for gold are derived using GFMS data on gold used for production multiplied by the average price of gold.

The difference between domestic gold production and industrial demand for gold is entered into the NIPAs in the form of an adjustment to net exports: specifically, the adjustment consists of removing the ITA estimates of exports (line 2) and imports (line 22) of nonmonetary gold and of adding "Gold, NIPAs" (line 24) to imports with its sign reversed.[30] This treatment maintains the relationship of GDP to gross domestic purchases (gross domestic purchases is equal to GDP minus net exports) while protecting the integrity of the other final expenditures components of GDP.[31]

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[28] Because source data do not allow a complete accounting of valuables for the United States, investments in valuables are not included in the NIPAs. See "Asset boundary" in chapter 2 of this handbook.
[29] Secondary production of gold is the supply of gold available from scrap (used gold).
[30] Thus, if domestic gold production exceeds industrial demand for gold (as it has since 1987), the excess supply of gold is available for export or for use as a store of valuables by domestic investors. If industrial demand exceeds domestic production, the gap in the supply of gold would need to be filled by imports.
[31] This treatment is not strictly appropriate for analyses of international competitiveness, but its effects will not be significant as long as the net values remain small and stable.

Adjustment for statistical differences (lines 3, 7, 23, and 28). The lines in table 8.2 for "statistical differences" reconcile the different revision cycles of the NIPAs and the ITAs discussed earlier.

Adjustment for U.S. territories (lines 4, 9, 25, and 29). As discussed earlier, the "U.S. estimates" for the NIPAs cover the 50 states, the District of Columbia, and U.S. military installations, embassies, and consulates abroad, while the "U.S. estimates" for the ITAs include these geographical areas as well as commonwealths and territories of the United States. Therefore, an adjustment must be made to the ITA statistics to make the geographic coverage consistent with the NIPA coverage. In practice, the adjustment is made only for Puerto Rico and the U.S. Virgin Islands; the value of trade with other U.S. territories and commonwealths is relatively small. The adjustment consists of adding the value of U.S. trade with Puerto Rico and with the U.S. Virgin Islands to the ITA estimates and of deducting the value of their trade with the rest of the world from the ITA estimates.

For U.S. exports and imports of goods to and from Puerto Rico and the U.S. Virgin Islands and for exports and imports between them and the rest of the world, the annual and quarterly estimates for the adjustments are based on the balance of payments accounts for those territories.

For exports and imports of services, the annual estimates of the value of U.S. exports to, and imports from, Puerto Rico are based on balance-of-payments data from Puerto Rico, and the quarterly estimates are based on judgmental trend. There is no territorial adjustment in the NIPAs for U.S. services exported to, or imported from, the U.S. Virgin Islands; however, the data for exports and imports of goods suggest that the value for services is very small. There is also no adjustment for the value of trade in services between either Puerto Rico or the U.S. Virgin Islands and the rest of the world; total trade data suggest that these values are also very small.

Adjustment for other items (line 8). In the ITAs, certain military grant transfers are treated as exports of services. In the NIPAs, some transfers of services under military grant programs, such as peace and humanitarian operations, are included in federal government transfer payments. Thus, an adjustment is made to remove these transfers from the ITA data on exports of services.

Adjustment for financial services furnished without payment (line 10). For 1986 to 2014, an imputation is made in the NIPAs to measure exports of financial services furnished without payment (imports of these services are not included in the NIPAs during this time period).[32]

[32] As part of the 2020 annual update of the ITAs, the ITAs include measures of both exports and imports of financial services furnished without payment beginning with 1999. As part of the 2020 annual update of the NIPAs, the NIPAs include the ITA measures beginning with 2015; the ITA measures back to 1999 will be incorporated as part of a future update of the NIPAs. The NIPAs include these imputations as part of "other exports of services" and "other imports of services."

This imputation is made for the value of the services (such as check-clearing, recordkeeping, and investment services) that are provided without explicit charge to depositors and to borrowers by financial intermediaries so that GDP and its components will be invariant to whether the charges for these services are implicit or explicit.[33]

For depositor services, the adjustment arises because U.S. depository institutions provide services to nonresidents for which they implicitly compensate themselves by paying depositors less interest on their deposits than the interest that the depository institutions earn from lending or investing funds. Thus, a depositor service is imputed as "financial services furnished without payment" and the NIPAs record the measure as exports of "other" services and as a corresponding entry in income payments to the rest of the world. Similarly, for borrower services, the adjustment arises because nonresidents pay a higher interest rate for loans in exchange for the unpriced services provided to them by U.S. institutions. The NIPAs record the imputed borrower service as exports of "other" services, and a corresponding entry is subtracted from income receipts from the rest of the world. The adjustments for depositor services and income payments are offsetting, as are those for borrower services and income receipts, so there is no net impact on the balance on current account.

Quantity and price estimates

In general, the estimates of quantities purchased, or real spending, for the most detailed components of most exports and imports are prepared by deflation. In the deflation method, the quantities are calculated by dividing the current-dollar value of the component by an appropriate price index.

For most categories of exports and imports of goods, the price indexes are BLS export and import price indexes. However, for several categories of capital goods that have known quality-adjustment challenges, alternative quality-adjusted indexes are substituted. Quality-adjusted prices from the Federal Reserve Board are used in deflating selected components of exports and imports of telecommunications equipment. A BLS producer price index is used to deflate exports of semiconductors.[34] A BLS consumer price index for smartphones is used to deflate components of imports of other durable household goods.[35] BEA quality-adjusted price indexes are used to deflate imports of

[33] Financial services furnished without payment by commercial banks and by the Federal Reserve to foreign commercial banks and to foreign governments are treated as exports of services. The underlying concepts and the source data and methods used for the imputation for commercial banks and its allocation are described in detail in in the technical note of "Chapter 5, Personal Consumption Expenditures," of this handbook. The source data for the imputation for the Federal Reserve are based on data on Federal Reserve transactions, assets, and liabilities from the balance sheet of the Federal Reserve.
[34] See Robert P. Parker and Eugene P. Seskin, "Annual Revision of the National Income and Product Accounts," *Survey* 77 (August 1997): 30.
[35] "Other durable household goods" includes smartphones; for more information on the indexes used to deflate purchases of cellular telephones, see Jason W. Chute, Stephanie H. McCulla, and Shelly Smith,

photocopier equipment.[36] and exports and imports of scientific, hospital, and medical equipment. Finally, several types of exports and imports of transportation equipment are deflated using specific PPIs, because export and import price indexes are not available at that level of detail.[37]

For most categories of services, BLS export or import prices are not available. Instead, PPIs, consumer price indexes, or BEA composite indexes of prices or of input costs are used for deflation.[38]

In addition, the quantity estimates for several categories of exports and imports are prepared using methods other than deflation. For example, the quantity estimates for petroleum and petroleum products imports are prepared using direct valuation—that is, by multiplying the base-year price by the current-period quantity data. (For general descriptions of the above methods, see "Estimates for detailed components" in chapter 4.)

The aggregate measures of exports and imports are calculated from the detailed components as chain-type quantity and price indexes (for information about these calculations, see "Estimates for NIPA aggregates" in chapter 4). BEA also prepares measures of real exports and imports and their components in a dollar-denominated form, designated "chained-dollar" estimates (see "Chained-dollar measures" in chapter 4). Net exports in chained dollars is calculated as the difference between chained-dollar exports and chained-dollar imports—that is, real net exports is derived as the difference between real exports and real imports.[39]

"Preview of the 2018 Comprehensive Update of the National Income and Product Accounts: Changes in Methods, Definitions, and Presentations," *Survey* 98 (April 2018)

[36] See Carol E. Moylan and Brooks B. Robinson, "Preview of the 2003 Comprehensive Revision of the National Income and Product Accounts: Statistical Changes," *Survey* 83 (September 2003): 30.

[37] For goods, the deflation is carried out for 107 categories of exports and for 110 categories of imports.

[38] For services, the deflation is carried out for 32 categories of exports and for 32 categories of imports.

[39] The Fisher formula cannot be used to compute quantity and price indexes for "net exports" because it would require taking the square root of a negative number. For more information, see the "Calculation of Output and Price Indexes" in the appendix to chapter 4: Estimating Methods in this handbook.

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services

Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
2	**Exports of goods:**			
3	Foods, feeds, and beverages	Monthly Census Bureau compilations of export data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Other feed grains: PPI for miscellaneous processed foodstuffs. Other components: BLS export price indexes for detailed end-use categories.
4	Industrial supplies and materials:			
5	Durable goods	Gold: the ITA estimate is replaced with an alternative estimate ("NIPA gold") that is recorded in imports. [See the section "Adjustments and other differences between the NIPA and ITA estimates."] Other components: monthly Census Bureau compilations of export documents with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Gold: same as for annual estimates. Other components: same as for annual estimates.	Precious metals except gold: PPI for metal ore mining. Other components: BLS export price indexes for detailed end-use categories.
6	Nondurable goods:			
7	Petroleum and products	Monthly Census Bureau compilations of export data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	BLS export price index for detailed end-use category.
8	Nondurable goods, excluding petroleum and products	Monthly Census Bureau compilations of export data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Electrical energy: BEA unit-value index based on Census Bureau values and quantities from export data converted to a balance-of-payments basis. Other components: BLS export price indexes for detailed end-use categories.
9	Capital goods, except automotive:			

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services

Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
10	Civilian aircraft, engines, and parts	Monthly Census Bureau compilations of export data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Civilian aircraft: BEA chain-type price index comprised of PPI for civilian aircraft, PPI for aircraft engines and engine parts, and PPI for aeronautical, nautical, and navigational instruments. Engines: BLS export price index for transportation equipment, excluding motor vehicles. Parts: BLS export price index for civilian aircraft parts.
11	Computers, peripherals, and parts	Monthly Census Bureau compilations of export data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Computers: BLS export price index for computers. Computer peripherals, accessories, and parts: BLS export price index for computer peripherals, accessories, and parts.
12	Other capital goods	Monthly Census Bureau compilations of export data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Semiconductors: PPI for semiconductors and related device manufacturing. Other industrial machinery: BEA weighted average of BLS export price for nonelectrical machinery and of BEA photocopier price. Railway transportation equipment: BEA chain-type price index comprised of PPI for railroad rolling stock, PPI for locomotives and locomotive parts, PPI for passenger and freight train cars, and PPI for engineering services. Vessels (except military and pleasure craft): BEA chain-type price index comprised of PPI for ship building and repairing, PPI for boat building, PPI for outboard motorboats, including commercial and military, and PPI for

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services				
Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
				inboard motorboats, including commercial and military. Spacecraft, engines, and parts, except military: BEA chain-type price index comprised of PPI for civilian aircraft, PPI for aircraft engines and engine parts, and PPI for aeronautical, nautical, and navigational instruments. Telecommunications equipment: for annual, BEA chain-type price index comprised of Federal Reserve Board (FRB) price indexes for data networking equipment, voice networking equipment, data transport equipment, and wireless networking equipment and of BLS export price index for telecommunications equipment; for current quarter, same as annual except PPI for communications equipment manufacturing price index replaces FRB price index. Scientific, hospital, and medical equipment and parts: for annual, BEA chain-type price index comprised of BEA price indexes for medical imaging equipment and electronic medical equipment, and of BLS export price index for scientific, hospital, and medical equipment and parts; for current quarter, BEA price index based on BLS export price index for scientific, hospital, and medical equipment and parts and quality adjustments by BEA. Other components: BLS export price indexes for detailed end-use categories.

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services

Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
13	Automotive vehicles, engines, and parts	Monthly Census Bureau compilations of export data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	BLS export price indexes for detailed end-use categories.
14	Consumer goods, except food and automotive:			
15	Durable goods	Monthly Census Bureau compilations of export data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	BLS export price indexes for detailed end-use categories.
16	Nondurable goods	Monthly Census Bureau compilations of export data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Cigars, cigarettes, and other tobacco manufactures: PPI for tobacco products. Other components: BLS export price indexes for detailed end-use categories.
17	Other exports of goods	Territorial adjustment for Puerto Rico and the U.S. Virgin Islands: balance-of-payments data from the Commonwealth of Puerto Rico and from the U.S. Virgin Islands and monthly Census Bureau data on trade in goods. [See the section "Adjustments and other differences between the NIPA and ITA estimates."] Net exports of goods under merchanting: BEA quarterly Survey of Transactions in Selected Services and Intellectual Property with Foreign Persons (BE-125). Other: monthly Census Bureau compilations of export data with adjustments by BEA for coverage	Territorial adjustment for Puerto Rico and the U.S. Virgin Islands: monthly Census Bureau data on trade in goods. Other: same as for annual estimates. Net exports of goods under merchanting: same as for annual estimates.	BEA chain-type price index for total exports excluding computers and a portion of semiconductors.

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services

Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
		and valuation to convert the data to a balance-of-payments basis.		
18	**Exports of services:**			
19	Transport	Sea freight expenditures: Customs and Border Protection (CBP) data on vessels recorded as exporting goods by sea, matched with IHS Markit's global database of vessels. Air freight expenditures: BEA quarterly Survey of U.S. Airline Operators' Foreign Revenues and Expenses (BE-37). Sea port expenditures: CBP data on goods imported by sea and IHS Markit data on vessels. Air port expenditures: BEA quarterly Survey of Foreign Airline Operators' Revenues and Expenses in the United States (BE-9). Air passenger transport: Department of Homeland Security (DHS) data on the number of foreign passengers on flights crossing the U.S. border, Department of Transportation data on flight patterns and average airfares from its Origin and Destination Survey, and Statistics Canada data on air passenger transport. Other modes of transport (truck freight, space freight, rail freight, pipeline freight, rail port, Great Lakes port): truck freight from Bureau of Transportation Statistics	Sea freight expenditures: for third estimate, same as for annual estimates; for second and advance estimates, freight volume extrapolated based on recent trends and freight rates extrapolated based on the Baltic Exchange's Baltic International Tanker Routes index and the Baltic Dry index. Air freight expenditures: for third estimate, same as for annual estimates; for second and advance estimates, BE-37 revenues extrapolated based on Census data on goods exports. Sea port expenditures: For third estimate, same as for annual estimates. For second and advance estimates, BE-29 foreign expenses and USACE data on freight volume extrapolated based on Census data on goods exports and imports. Air port expenditures: for third estimate, same as for annual estimates; for second and advance estimates, BE-9 foreign expenses extrapolated based on Census data on goods exports and imports and on monthly enplanements data reported by Air Transport Association and by individual airlines.	Sea freight expenditures: PPI for deep sea freight transportation and PPI for coastal and Great Lakes freight transportation. Air freight expenditures: BLS export price for air freight receipts. Sea port expenditures: BEA weighted average of PPI for marine cargo handling, PPI for port and harbor services, PPI for navigational services to shipping, and PPI for coastal and Great Lakes freight transportation. Air port expenditures: BEA weighted average of PPI for airport operations, PPI for freight transportation arrangement, and PPI for aircraft parts and auxiliary equipment. Air passenger transport: BLS export price index for passenger fares. Other modes of transport: PPI for general freight trucking—long distance, PPI for line-haul railroads, PPI for pipeline transportation of crude oil, PPI for freight transportation arrangement, PPI for US postal services, and BLS export price index for air freight receipts.

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services				
Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
		(BTS), space freight from U.S. Federal Aviation Administration (FAA), rail freight from U.S. Surface Transportation Board, pipeline freight from company data, rail port from Statistics Canada, postal from the United States Postal Service.	Air passenger transport: Same as for annual estimates subject to source data availability. Missing source data are extrapolated as follows: for average airfares (for all countries except Canada), based on the BLS export price index for passenger fares; and for average airfares for Canada, based on the growth rate of the number of Canadian air travelers returning to Canada from Statistics Canada data. Other modes of transport: for third estimate, same as for annual estimates. For second and advance estimates, for truck freight, BTS data on truck freight extrapolated based on Census data on goods exports and imports; for space freight (satellite launch services), FAA data; for rail freight, data from Statistics Canada and U.S. Surface Transportation Board; for pipeline freight, company data; for rail port, BE-29 data on foreign expenses in the United States and USACE volume data extrapolated based on recent quarterly trends; for postal, USPS data.	
20	Travel (for all purposes including education)	Other business and Other personal travel: DHS data on the number of foreign travelers to the U.S, International Trade Administration National Travel and Tourism Office (NTTO) data on average expenditures from its Survey of	Other business and Other personal travel: same as for annual estimates subject to source data availability. Missing source data are extrapolated as follows: for the number of foreign travelers to the United States from all countries except Mexico, forecast	Other business and Other personal travel: BLS CPI for foreign travel in the United States. Expenditures of seasonal, border and other short-term workers: BLS CPI for foreign travel in the United States.

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services				
Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
		International Air Travelers (SIAT), Statistics Canada data on expenditures by Canadian travelers in the United States, and Mexico's National Institute of Statistics and Geography (INEGI) data on expenditures of Mexican travelers in the U.S. Expenditures by border, seasonal, and other short-term workers: For Mexican residents who commute to work in the United States, based on data from academic and other studies. For Canadian residents who commute to work in the United States, based on data from Statistics Canada. For all other workers, based on data on the number of and average expenditures by foreign residents working in the United States from a variety of sources, including the U.S. State Department and U.S. Department of Labor. Education-related travel: DHS Student and Exchange Visitor Information Service data on number of and average expenditures by students. Health-related travel: SIAT data on the incidence of health-related travel and average expenditures and NTTO data on the number of travelers. For Canada and Mexico,	using an ARIMA model. For average expenditures of foreign travelers in the U.S. from all countries except Mexico, extrapolated based on recent quarterly trends. For average expenditures of foreign travelers from Mexico, extrapolated based on recent quarterly trends. Expenditures of seasonal, border and other short-term workers: expenditures of foreign travelers in the U.S. extrapolated based on recent quarterly trends. Education-related travel: For numbers of students, forecast using an ARIMA model. For average tuition, extrapolated based on the CPI for "college tuition and fees." For average living expenses, extrapolated based on the CPI for "all items in U.S. city averages." Health-related travel: same as for annual estimates subject to source data availability. Missing source data are extrapolated as follows: For number of foreign travelers to the United States from all countries, forecast using an ARIMA model; for average expenditure, forecast based on recent quarterly trends. .	Education-related travel: CPI for college tuition and fees. Health-related travel: CPI for hospitals and related services.

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services

Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
		statistics provided by Statistics Canada and INEGI are also used.		
21	Charges for the use of intellectual property n.e.c.	BEA benchmark (BE-120) and quarterly (BE-125) Survey of Transactions in Selected Services and Intangible Assets with Foreign Persons.	BE-120/125 data extrapolated based on recent quarterly trends and on publicly available industry data.	BEA implicit price deflator for final sales to domestic purchasers.
22	Other business services	Telecommunications, computer, and information services: BEA benchmark (BE-120) and quarterly (BE-125) Survey of Transactions in Selected Services and Intangible Assets with Foreign Persons, Census Bureau data on equipment repairs, and BEA estimates of medical services. Insurance services: BEA benchmark (BE-140) and quarterly (BE-45) Survey of Insurance Transactions by U.S. Insurance Companies with Foreign Persons, BE-125 data on insurance transactions, and publicly available industry data. Financial services: BEA benchmark (BE-180) and quarterly (BE-185) Survey of Financial Services Transactions between U.S. Financial Services Providers and Foreign Persons, U.S. Treasury Department surveys of international capital flows, and Bloomberg financial market data. Maintenance and repair services: Census Bureau data on	Telecommunications, computer, and information services: BE-120/125 data extrapolated based on recent quarterly trends, Census Bureau data on equipment repairs, and BEA estimates of medical services. Insurance services: BE-140/45 data extrapolated based on recent quarterly trends and on publicly available industry data. Financial services: BE-180/185 data extrapolated based on monthly data from the U.S. Treasury Department surveys of international capital flows, on BEA estimates of average brokerage commission rates and fees, on recent quarterly trends, on publicly available industry data, and on Bloomberg financial market data. Maintenance and repair services: Census Bureau data on maintenance and repairs and BE-125 data extrapolated based on recent quarterly trends. Other-other business services: based on BEA quarterly BE-125 survey data.	Telecommunications, computer, and information services: BEA chain-type price index comprised of the PPI for telecommunications, cable, and internet user services, the PPI for data processing and related services, and the PPI for software publishing. Insurance services: Fixed weighted composite of the PPI for direct life insurance carriers and the PPI for premiums of property and casualty insurance. Financial services: PPI for security and commodity contracts. Maintenance and repair services: PPI for commercial machinery repair and maintenance. Other-other business services: BEA implicit price deflator for final sales to domestic purchasers.

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services				
Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
		maintenance and repairs and BEA quarterly (BE-125) Survey of Transactions in Selected Services and Intellectual Property with Foreign Persons. Other-other business services: based primarily on BEA quarterly BE-125 survey and benchmark BE-120 survey data.		
23	Government goods and services n.e.c	Transfers under U.S. military agency sales contracts: Department of Defense data on services and some goods provided by U.S. military agencies adjusted by BEA to exclude certain transfers under military grant programs, such as peace and humanitarian operations, which are treated in the NIPAs as federal government defense expenditures. U.S. government miscellaneous services: data reported by U.S. government agencies. U.S. receipts of international organizations: Annual estimates based on headcounts of U.S. residents working for International Organizations (IOs) in the U.S, based on publicly available information reported by various IOs.	Transfers under U.S. military agency sales contracts: For third estimate, same as for annual estimates. For second and advance estimates, extrapolated based on recent quarterly trends. U.S. government miscellaneous services: for third estimate, same as for annual estimates; for second and advance estimates, recent quarterly trends. U.S. receipts of international organizations: Extrapolated based on budget projections and data provided to BEA by other U.S. government agencies.	Transfers under U.S. military agency sales contracts: BEA chain-type price indexes for military facilities construction, for military services excluding compensation, and for other equipment (general government expenditures for medical, construction, industrial, ammunition plant, atomic energy, weapons and fire control, general and other military). U.S. government miscellaneous services: BEA weighted average of employment cost index for professional and related services, employment cost index for office and administrative support, and employment cost index for total compensation for private industry workers in production and PPI for offices of physicians. U.S. receipts of international organizations: BEA deflator for installation support services.
24	Other exports of services	Territorial adjustment: for Puerto Rico, annual balance of payments data from the Commonwealth of Puerto Rico. [See the section	Territorial adjustment: for Puerto Rico, BEA projections. Financial services furnished without payment: data from U.S. Treasury	Territorial adjustment: weighted average of BEA price indexes for exports of travel, for exports of transportation, and for

Table 8.A—Summary of Methodology Used to Prepare Estimates of Exports of Goods and Services				
Line in NIPA table group 4.2	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	
		"Adjustments and other differences between the NIPA and ITA estimates."] Financial services furnished without payment: data from U.S. Treasury Department surveys of international claims and liabilities of U.S. financial institutions on foreign residents, the Federal Deposit Insurance Corporation *Call Reports,* and publicly available industry data.	Department surveys of international claims and liabilities of U.S. financial institutions on foreign residents, the Federal Deposit Insurance Corporation *Call Report,* publicly available trade data, and recent quarterly trends.	exports of other business services excluding insurance. Financial services furnished without payment: for annual, quantity extrapolation, using BLS banking output indexes; for quarterly, judgmental trend.

* The NIPA annual estimates are also consistent with changes to methodology, source data, or seasonal factors implemented during the annual revision of the ITAs.
** For the goods components that use monthly Census Bureau compilations of export data, the source data for the "advance" quarterly estimate are available for only the first 2 months of the quarter; the third month is based on BEA projections using publicly available information. For both goods and services, the third quarterly estimates incorporate the ITA revisions to the monthly trade data.

BEA Bureau of Economic Analysis
BLS Bureau of Labor Statistics
CPI Consumer Price Index, BLS
ITAs International Transactions Accounts, BEA
NIPAs National Income and Product Accounts, BEA
PPI Producer Price Index, BLS

Table 8.B—Summary of Methodology Used to Prepare Estimates of Imports of Goods and Services				
Line in NIPA group 4.2	Component	Current-dollar estimates		
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
26	**Imports of goods:**			
27	Foods, feeds, and beverages	Monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Cane and beet sugar: PPI for raw cane sugar and sugar cane mill products. Dairy products and poultry: PPI for dairy products. Other components: BLS import price indexes for detailed end-use categories.
28	Industrial supplies and materials:			
29	Durable goods	Gold: the ITA estimate is replaced with an alternative estimate ("NIPA gold"), which is based on data from Gold Fields Minerals Services (GFMS). [See the section on "Adjustments and other differences between the NIPA and ITA estimates."] Other components: monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Gold: same as for annual estimates and data from U.S. Geological Survey's *Mineral Industry Surveys—Precious Metals*. Other components: Same as for annual estimates.	Gold: PPI for metal ore mining. Other components: BLS import price indexes for detailed end-use categories.
30	Nondurable goods:			
31	Petroleum and products	Monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Direct valuation using quantities and unit-value indexes from monthly Census Bureau compilations of import data converted to a balance-of-payments basis.
32	Nondurable goods, excluding petroleum and products	Monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Electrical energy: BEA unit-value index based on Census Bureau values and quantities from import data converted to a balance-of-payments basis. Other components: BLS import price indexes for detailed categories.
33	Capital goods, except automotive:			
34	Civilian aircraft, engines, and parts	Monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Civilian aircraft: BEA chain-type price index comprised of PPI for civilian aircraft, PPI for aircraft engines and engine parts, and PPI for aeronautical, nautical, and navigational instruments.

Table 8.B—Summary of Methodology Used to Prepare Estimates of Imports of Goods and Services				
Line in NIPA group 4.2	Component	Current-dollar estimates		
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
				Engines: BLS import price index for civilian aircraft engines. Parts: BLS import price index for civilian aircraft engines.
35	Computers, peripherals, and parts	Monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Computers: BLS import price index for computers. Computer peripherals, accessories, and parts: BLS import price index for computer peripherals, accessories, and parts.
36	Other capital goods	Monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Semiconductors: BLS import price index for semiconductors. Other industrial machinery: BEA weighted average of BLS import price index for business machinery and equipment, except computers and of BEA photocopier price. Railway transportation equipment: BEA chain-type price index comprised of PPI for railroad rolling stock, PPI for locomotives and locomotive parts, PPI for passenger and freight train cars, and PPI for engineering services. Vessels (except military and pleasure craft): BEA chain-type price index comprised of PPI for ship building and repairing, PPI for boat building, PPI for outboard motorboats, including commercial and military, and PPI for inboard motorboats, including commercial and military. Spacecraft, engines, and parts, except military: BEA chain-type price index comprised of PPI for civilian aircraft, PPI for aircraft engines and engine parts, and PPI for aeronautical, nautical, and navigational instruments. Telecommunications equipment: for annual, BEA chain-type price index comprised of Federal Reserve Board price indexes for data networking equipment, voice networking equipment, data transport equipment, and wireless networking equipment and of BLS import price index for telecommunications

Table 8.B—Summary of Methodology Used to Prepare Estimates of Imports of Goods and Services				
Line in NIPA group 4.2	Component	Current-dollar estimates		
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
				equipment; for current quarter, same as annual except PPI for communications equipment manufacturing price index replaces FRB price index. Scientific, hospital, and medical equipment and parts: for annual, BEA chain-type price index comprised of BEA price indexes for medical imaging equipment and electronic medical equipment, and of BLS import price index for scientific, hospital, and medical equipment and parts; for current quarter, BEA price index based on BLS import price index for scientific, hospital, and medical equipment and parts and quality adjustments by BEA. Other components: BLS import price indexes for detailed end-use categories.
37	Automotive vehicles, engines, and parts	Monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	BLS import price indexes for detailed end-use categories.
38	Consumer goods, except food and automotive:			
39	Durable goods	Monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	Other household goods: BEA chain-type price index comprised of the BLS import price index for other household goods and the CPI for smartphones. Other components: BLS import price indexes for detailed end-use categories.
40	Nondurable goods	Monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.	Same as for annual estimates.	BLS import price indexes for detailed end-use categories.
41	Other imports of goods	Territorial adjustment for Puerto Rico and the U.S. Virgin Islands: balance-of-payments data from the Commonwealth of Puerto Rico and from the U.S. Virgin Islands and monthly Census Bureau data on trade in goods. [See the section	Territorial adjustment for Puerto Rico and the U.S. Virgin Islands: monthly Census Bureau data on trade in goods. Other: same as for annual estimates.	Territorial adjustment for Puerto Rico: BEA weighted average of BEA chain-type price index for total imports excluding petroleum, computers, semiconductors, and gold and of PPI for pharmaceutical preparation manufacturing.

Table 8.B—Summary of Methodology Used to Prepare Estimates of Imports of Goods and Services				
Line in NIPA group 4.2	Component	Current-dollar estimates		
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		"Adjustments and other differences between the NIPA and ITA estimates."] Other: monthly Census Bureau compilations of import data with adjustments by BEA for coverage and valuation to convert the data to a balance-of-payments basis.		Territorial adjustment for the U.S. Virgin Islands: PPI for petroleum refineries. Other: BEA chain-type price index for total imports excluding petroleum, computers, semiconductors, and gold.
42	**Imports of services:**			
43	Transport	Sea freight expenditures: Customs and Border Protection (CBP) data on vessels recorded as importing goods by sea, matched with IHS Markit's global database of vessels. Air freight expenditures: BEA quarterly Survey of U.S. Airline Operators' Foreign Revenues and Expenses (BE-37). Sea port expenditures: CBP data on goods exported by sea and IHS Markit data on vessels. Air port expenditures: BEA quarterly Survey of Foreign Airline Operators' Revenues and Expenses in the United States (BE-9). Air passenger transport: Department of Homeland Security (DHS) data on the number of U.S. citizen passengers on flights crossing the U.S. border, Airline Reporting Corporation data on flight patterns and average airfares, and Statistics Canada data on air passenger transport. Other (truck freight, space freight, rail freight, pipeline freight, rail port): truck freight from Bureau of Transportation Statistics (BTS), space freight from the Federal Aviation Administration	Sea freight expenditures: for third estimate, same as for annual estimates; for second and advance estimates, freight volume extrapolated based on recent trends and freight rates extrapolated based on the Baltic Exchange's Baltic International Tanker Routes index and the Baltic Dry index. . Air freight expenditures: for third estimate, same as for annual estimates; for second and advance estimates, BE-37 revenues extrapolated based on Census data on goods exports. Sea port expenditures: For third estimate, USACE freight volume data is multiplied by port rates extrapolated based on historical trends. For second and advance estimates, BE-29 foreign expenses and USACE data on freight volume extrapolated based on Census data on goods exports and imports. Air port expenditures: for third estimate, same as for annual estimates; for second and advance estimates, BE-9 foreign expenses extrapolated based on Census data on goods exports and imports and on monthly enplanements data reported by Airlines for America or on monthly	Sea freight expenditures: PPI for deep sea freight transportation and PPI for coastal and Great Lakes freight transportation. Air freight expenditures: BLS import price for air freight receipts. Sea port expenditures: BEA weighted average of PPI for marine cargo handling, PPI for port and harbor services, PPI for navigational services to shipping, and PPI for coastal and Great Lakes freight transportation. Air port expenditures: BEA weighted average of PPI for airport operations, PPI for freight transportation arrangement, and PPI for aircraft parts and auxiliary equipment. Passenger air transport: BLS import price index for passenger fares. Other: PPI for general freight trucking—long distance, PPI for line-haul railroads, PPI for freight transportation arrangement, PPI for US postal services, and BLS import price index for air freight receipts.

Table 8.B—Summary of Methodology Used to Prepare Estimates of Imports of Goods and Services				
Line in NIPA group 4.2	Component	Current-dollar estimates		
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Commercial Space Transportation Year in review, rail freight from U.S. Surface Transportation Board, pipeline freight from company data, rail port from Statistics Canada.	revenue passenger miles data reported by individual airlines. Air passenger transport: Same as for annual estimates subject to source data availability. Missing source data are extrapolated as follows: For average airfares for all countries except Canada, based on the BLS import price index for passenger fares. For average airfares for Canada, based on the growth rate of the number of U.S. air travelers to Canada from Statistics Canada data. Other: For third estimate, same as for annual estimates. For second and advance estimates, for truck freight, BTS data extrapolated based on Census data on goods exports and imports; for space freight (satellite launch services), FAA data; for rail freight, and data from Statistics Canada and U.S. Surface Transportation Board; for pipeline freight, company data,	
44	Travel (for all purposes including education)	Other business and Other personal travel: DHS data on the number of U.S. travelers overseas, International Trade Administration National Travel and Tourism Office (NTTO) data on average expenditures from its Survey of International Air Travelers (SIAT), Statistics Canada data on expenditures by U.S. travelers in Canada, and Mexico's National Institute of Statistics and Geography(INEGI) data on expenditures of U.S. travelers in Mexico. Expenditures by border, seasonal, and other short-term workers: data on expenditures abroad of U.S. residents employed temporarily abroad.	Other business and Other personal travel: Same as for annual estimates subject to source data availability. Missing source data are extrapolated as follows: for the number of U.S. travelers overseas to all countries except Mexico, forecast using an ARIMA model; for average expenditures of U.S. travelers overseas, to all countries except Mexico, based on recent quarterly trends; and for Mexico, based on recent quarterly trends. Expenditures of seasonal, border and other short-term workers: expenditures abroad of U.S. residents employed temporarily abroad extrapolated based on recent quarterly trends.	Other business and Other personal travel: BEA weighted average of foreign CPIs for all items, adjusted by exchange rates. Expenditures of seasonal, border and other short-term workers: BEA weighted average of foreign CPIs for all items, adjusted by exchange rates. Education-related travel: BEA weighted average of foreign CPIs for all items adjusted by exchange rates. Health-related travel: extrapolated based on CPI for hospitals and related services.

Table 8.B—Summary of Methodology Used to Prepare Estimates of Imports of Goods and Services				
Line in NIPA group 4.2	Component	Current-dollar estimates		
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Education-related travel: Institute of International Education data on the number of students enrolled in a program abroad through a U.S. institution; United Nations Education, Scientific, and Cultural Organization Institute for Statistics data on the number of U.S. students directly enrolled in a foreign institution; and other sources on numbers of students. SEVIS data on average expenditures. Health-related travel: SIAT data on the incidence of health-related travel and average expenditures and NTTO data on number of travelers. For Canada and Mexico, statistics provided by Statistics Canada and INEGI are also used.	Education-related travel: number of students forecast using an ARIMA model; average tuition extrapolated based on the CPI for "college tuition and fees"; average living expenses extrapolated with the CPI for "all items in U.S. city averages. Health-related travel: same as for annual estimates subject to source data availability. Missing source data are extrapolated as follows: For number of foreign travelers to the United States from all countries, forecast using an ARIMA model; for average expenditure, forecast based on recent quarterly trends.	
45	Charges for the use of intellectual property n.e.c.	BEA benchmark (BE-120) and quarterly (BE-125) Survey of Transactions in Selected Services and Intangible Assets with Foreign Persons.	BE-120/125 data extrapolated based on recent quarterly trends and on publicly available industry data.	BEA implicit price deflator for final sales to domestic purchasers.

Table 8.B—Summary of Methodology Used to Prepare Estimates of Imports of Goods and Services				
Line in NIPA group 4.2	Component	Current-dollar estimates		
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
46	Other business services	Telecommunications, computer, and information services: BEA benchmark (BE-120) and quarterly (BE-125) Survey of Transactions in Selected Services and Intellectual Property with Foreign Persons, Census Bureau data on equipment, repairs, and BEA estimates of medical services. Insurance services: BEA benchmark (BE-140) and quarterly (BE-45) Survey of Insurance Transactions by U.S. Insurance Companies with Foreign Persons, BE-125 data on insurance transactions, and publicly available industry data. Financial services: BEA benchmark (BE-180) and quarterly (BE-185) Survey of Financial Services Transactions Between U.S. Financial Services Providers and Foreign Persons; BE-125 data on financial services transactions; U.S. Treasury Department surveys of international capital flows, and Bloomberg financial market data. Maintenance and repair services: Census Bureau data on maintenance and repairs and BEA quarterly (BE-125) Survey of Transactions in Selected Services and Intellectual Property with Foreign Persons. Other-other business services: based primarily on BEA quarterly BE-125 survey and benchmark BE-120 survey data.	Telecommunications, computer, and information services: BE-120/125 data extrapolated based on recent quarterly trends, Census Bureau data on equipment repairs, and BEA estimates of medical services. Insurance services: BE-140/45/125 data extrapolated based on recent quarterly trends and on publicly available industry data. Financial services: BE-180/185/125 data extrapolated based on monthly data from the U.S. Treasury Department surveys of international capital flows, on BEA estimates of average brokerage commission rates and fees, on recent quarterly trends, on publicly available industry data, and Bloomberg financial market data. Maintenance and repair services: Census Bureau data on maintenance and repairs and BE-125 data extrapolated based on recent quarterly trends. Other-other business services: based on BEA quarterly BE-125 survey data.	Telecommunications, computer, and information services: BEA chain-type index comprised of the PPI for telecommunications, cable, and internet user services, the PPI for data processing and related services, and the PPI for software publishing. Insurance services: Fixed weighted composite of the PPI for direct life insurance carriers and the PPI for premiums of property and casualty insurance. Financial services: PPI for security and commodity contracts. Maintenance and repair services: PPI for commercial machinery repair and maintenance. Other-other business services: BEA implicit price deflator for final sales to domestic purchasers.
47	Government goods and services n.e.c.	Direct defense expenditures: Department of Defense (DOD) data on expenditures by U.S. military installations abroad and by U.S. military personnel abroad.	Direct defense expenditures: For third estimate, same as for annual estimates; for second and advance estimates, DOD data extrapolated based on recent quarterly trends.	Direct defense expenditures: BEA chain-type price indexes for federal government investment in equipment and software, for military facilities construction, for transportation services, for federal procurement of clothing, textiles, and

Table 8.B—Summary of Methodology Used to Prepare Estimates of Imports of Goods and Services				
Line in NIPA group 4.2	Component	Current-dollar estimates		
		Benchmark-year and nonbenchmark-year estimates*	Current quarterly estimates**	Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		U.S. government miscellaneous services: ITA data from U.S. government agencies.	U.S. government miscellaneous services: for third estimate, same as for annual estimates; for second and advance estimates, recent quarterly trends.	food, for installation support services, and for foreign labor personnel expenditures. U.S. government miscellaneous services: BEA weighted average of foreign CPIs for all items, adjusted by exchange rates.
48	Other imports of services	Territorial adjustment: for Puerto Rico, annual balance-of-payments data from the Commonwealth of Puerto Rico. [See the section "Adjustments and other differences between the NIPA and the ITA estimates."] Financial services furnished without payment: data from U.S. Treasury Department surveys of international claims and liabilities of U.S. financial and commercial institutions on foreign residents, statistics provided by partner country statistical agencies, the Federal Deposit Insurance Corporation *Call Reports,* and publicly available industry data.	Territorial adjustment: for Puerto Rico, BEA projections. Financial services furnished without payment: data from U.S. Treasury Department surveys of international claims and liabilities of U.S. financial and commercial institutions on foreign residents, the Federal Deposit Insurance Corporation *Call Reports,* publicly available industry data, and recent quarterly trends.	Territorial adjustment: weighted average of BEA price indexes for imports of other transportation services, for exports of travel, for imports of other business services excluding insurance, and for federal government nondefense services. Financial services furnished without payment: for annual, quantity extrapolation, using BLS banking output indexes; for quarterly, judgmental trend.

* The annual NIPA estimates are also consistent with changes to methodology, source data, or seasonal factors implemented during the annual revision of the ITAs.
**For the goods components that use monthly Census Bureau compilations of import data, the source data for the "advance" quarterly estimate are available for only the first 2 months of the quarter; the third month is based on BEA projections using publicly available information. For both goods and services, the third quarterly estimates incorporate the ITA revisions to the monthly trade data.

BEA Bureau of Economic Analysis
BLS Bureau of Labor Statistics
CPI Consumer Price Index, BLS
ITAs International Transactions Accounts, BEA
NIPAs National Income and Product Accounts, BEA
PPI Producer Price Index, BLS

CHAPTER 9: GOVERNMENT CONSUMPTION EXPENDITURES AND GROSS INVESTMENT

(Updated: October 2019)

Definitions and Concepts
Recording in the NIPAs
Overview of Source Data and Estimating Methods
    Benchmark-year and nonbenchmark-year estimates
    Current quarterly estimates
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Table 9.A—Summary of Methodology for Government Consumption Expenditures
Table 9.B—Summary of Methodology for Government Gross Investment

Government consumption expenditures and gross investment measures the portion of gross domestic product (GDP), or final expenditures, that is accounted for by the government sector. Government consumption expenditures consists of spending by government to produce and provide services to the public, such as national defense and public school education. Gross investment consists of spending by government for fixed assets that directly benefit the public, such as highway construction, or that assist government agencies in their production activities, such as purchases of military hardware.

Government activity—at the federal, state, and local levels—affects the economy in many ways. As noted above, governments contribute to economic output when they provide services to the public and when they invest in capital. They also provide social benefits, such as social security and Medicare, to households. Governments also affect the economy through taxes and by providing incentives for various business activities. In addition, governments affect the economy through their collective saving, the difference between their revenue and spending.[1]

BEA prepares estimates of government consumption expenditures and gross investment for the federal government sector and for the state and local government sector.[2] Estimates of government consumption expenditures and gross investment by function—such as defense, health, and education—provide information on how governments allocate their funds. The full array of government estimates is particularly

[1] The estimates of government current receipts and expenditures are presented in table 3.1 of the national income and product accounts.
[2] For a detailed, though dated, description of the methodology used to prepare the estimates for the government sector, see U.S. Bureau of Economic Analysis, *MP-5: Government Transactions* (Methodology Papers: U.S. National Income and Product Accounts, September 2005), available on BEA's website at www.bea.gov.

useful to policymakers, business decisionmakers, and other data users in analyzing the effects of various economic policies.[3]

The estimates of government consumption expenditures and gross investment are an integral part of the U.S. national income and product accounts (NIPAs), a set of accounts that provides a logical and consistent framework for presenting statistics on U.S. economic activity (see "Chapter 2: Fundamental Concepts"). In addition, the estimates of gross investment by government provide the building blocks for the estimates of government-owned fixed assets in BEA's fixed assets and consumer durable goods accounts.[4]

Definitions and Concepts

In the NIPAs, government is treated as a producer that uses labor, capital, and intermediate inputs to provide goods and services on behalf of the general public. In its role as a producer, value added by government measures the contribution of the government sector to total value added across all industries, which is equal to GDP. In addition, government is treated as either a consumer of, or an investor in, many of the goods and services that it produces. In its role as a consumer/investor, government consumption expenditures and gross investment measures the portion of final expenditures for GDP that is accounted for by the government sector. (For a discussion of the three methods for measuring GDP, see chapter 2.)

In the NIPAs, the framework for government consumption expenditures explicitly recognizes government as a producer of goods and services (table 9.1). The gross output of *general government* consists of all of the goods and services produced by general government (see the box "General Government and Government Enterprises" on the next page). The value of this output is measured by the cost of inputs—that is, as the sum of employee compensation, of consumption of fixed capital (CFC), and of intermediate goods and services purchased.[5] This framework is parallel to the concepts and presentation of output and intermediate inputs of private business (and of government enterprises) in BEA's input-output accounts and GDP-by-industry accounts. However,

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[3] See Mark S. Ludwick and Benjamin A. Mandel, "Analyzing Federal Programs Using BEA Statistics: A Look at Unemployment Insurance Benefits Payments," *Survey of Current Business* 91 (September 2011): 14-17.

[4] As noted in chapter 2 of this handbook, fixed assets are produced assets that are used repeatedly or continuously in the production process—that is, in the production of other goods (including other fixed assets) or of services—for more than 1 year. For a description of the methodology for BEA's estimates of the stocks and depreciation of fixed assets and of the investment flows used to derive them, see U.S. Bureau of Economic Analysis, *Fixed Assets and Consumer Durable Goods in the United States 1925–97*, September 2003, available on BEA's website at www.bea.gov.

[5] CFC, or depreciation, measures the decline in the value of the stock of fixed assets due to physical deterioration, normal obsolescence, and accidental damage; however, it does not include losses caused by a natural disaster or war losses of military equipment. CFC for general government provides a partial measure of the services derived from government capital investment—that is, of the value added (measured as the expense incurred) as a result of using government capital goods in the production of services. (CFC is only a partial measure because the rate of return on government assets is assumed to be zero.)

for business, output is valued at market prices, and the difference between the value of output and the costs of production is equal to the net operating surplus, while for general government, the difference between output and costs, by definition, is zero (see the box "Measuring the Output of Governments" on the next page).

General Government and Government Enterprises

Government output is divided into market and nonmarket output. Most government output is nonmarket in nature, meaning that services, such as public education and law enforcement, are provided without charge or with only a nominal charge. The nonmarket output of the government sector is classified in the NIPAs as *general government* output.

In contrast, certain government entities provide goods and services that are sold directly to households and businesses in market transactions that recover all or a considerable portion of their operating costs. In the NIPAs, these entities are called *government enterprises*. Generally, government enterprises provide services in the market economy because special circumstances—such as natural monopolies and externalities—prevent private companies from doing so. In addition, government enterprises may undertake projects of a scale too large for the private sector, or they may perform a public service that would result in operating losses if performed by the private sector.

The largest government enterprise is the United States Postal Service. Other federal government enterprises include power authorities, such as the Tennessee Valley Authority, and insurance enterprises, such as the National Flood Insurance Program. State and local government enterprises include housing authorities, transit systems, airports, water ports, and utilities.

In the NIPAs, the value added by government enterprises (as producers of goods and services for the marketplace) is recorded in the business sector, along with that of private businesses. Sales of goods and services by government enterprises to persons are recorded as personal consumption expenditures, and those to businesses are recorded as intermediate purchases. However, the NIPA presentation of fixed investment, as with a number of other NIPA-table presentations, is split between "private" and "government" (rather than between "business" and "general government"), so the gross investment of government enterprises is included with that of general government.

Measuring the Output of Governments

Difficult conceptual and practical problems arise in measuring the output of governments, primarily because most of this output is not sold in the marketplace (see the box "General Government and Government Enterprises"). Among these problems are the measurement of nonmarket services and the measurement of change over time in the real services provided by government.

For the nonmarket services produced by general government, standard practice as recommended by the System of National Accounts is to value output in terms of the input costs incurred in production.[6] These costs include labor, materials, and supplies, and they also include the use of fixed capital. BEA uses a depreciation measure known as "consumption of fixed capital" as a partial measure of the annual services produced by the existing stock of government fixed capital; this approach implicitly assumes that the net return for general government fixed assets is zero. In contrast, the cost of capital services for private market producers includes a positive net return. Alternatively, BEA could augment its measure of capital services by including a net return on assets, a change that would tend to raise the overall level of government output and consumption expenditures, and thus GDP. Several approaches have been suggested: using a private sector rate of return, a municipal bond rate, the Office of Management and Budget hurdle rate for investment, or others.[7]

For real services provided by government, BEA's estimates of real government consumption expenditures are generally based on changes in the real inputs, and thus assume that there is no change in productivity. If possible, it would be preferable to measure actual changes in the quantity or volume of the services provided, thus allowing for changes in productivity. Some services, such as national defense, are pure public goods and are difficult to quantify, even in theory. However, other services, particularly for state and local governments, can be measured directly: for example, number of criminals arrested, number of fires extinguished, number of students educated, or number of patients treated. Some countries, including the United Kingdom, use caseload numbers as a way of quantifying real government output directly, but such measures have been subject to criticism.

BEA has conducted research in a number of areas pertaining to alternative measures of real government output.[8] This research is currently preliminary, and further research is needed before these measures can be considered for implementation in the national accounts.

[6] Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and the World Bank, *System of National Accounts 2008* (SNA 2008)*:* 2.59.

[7] M. Courtney and Martin H. David, eds., *Measuring the Government Sector of the U.S. National Accounts*, National Research Council, Washington DC, National Academies Press, 1998.

[8] For example, see Barbara Fraumeni, Marshall B. Reinsdorf, Brooks B. Robinson, Matthew P. Williams, "Price and Real Output Measures for the Education Function of Government: Exploratory Estimates for Primary and Secondary Education," in *Price Index Concepts and Measurement*, W. Erwin Diewert, John S. Greenlees, and Charles R. Hulten, eds., University of Chicago Press, 2009, 373-403.

Table 9.1—Government Consumption Expenditures and Gross Investment and Government Gross Output
[2012, billions of dollars]

Government consumption expenditures and gross investment	**3137.1**
Consumption expenditures	**2516.0**
Gross output of general government	2994.3
Value added	1989.1
Compensation of general government employees	1556.2
Consumption of general government fixed capital	433.0
Intermediate goods and services purchased	1005.1
Durable goods	72.3
Nondurable goods	297.5
Services	635.3
Less: Own-account investment	73.8
Sales to other sectors	404.5
Gross investment	**621.0**
Structures	287.5
Equipment	143.1
Intellectual property products	190.4

The output of general government consists of the following: (1) services that are provided to the general public either free of charge or at a charge that is considerably less than the cost of providing the service and (2) structures, software, and research and development that are produced by government for use in future production by government (own-account investment).[9] In the NIPAs, such own-account investment is classified as part of government gross investment. Thus, in order to avoid double counting in calculating GDP, own-account investment by general government, as measured by input costs, is subtracted from general government gross output in deriving government consumption expenditures.

The value of the services that are provided by government free of charge, whether to individual members of society (such as education at public elementary schools) or to society as a whole (such as national defense or law enforcement), is included in government consumption expenditures. In effect, government is treated as the final purchaser of these services.

For services that are provided by government at a reduced charge (such as tuition paid to public universities), the fees paid by the public are recorded as personal consumption expenditures (PCE) if paid by persons or as intermediate inputs if paid by business. Thus, in order to avoid double counting in calculating GDP, the portion of the value of the output of services that is covered by fees is recorded as "sales to other sectors" and is subtracted from gross output of general government in deriving government consumption expenditures. The remaining value of this output—that is, the difference between the costs incurred in providing the services and the fees collected for

[9] The relatively small amount of noninvestment goods, such as books, that are produced by general government is included in services.

the services—is included in government consumption expenditures. In effect, government is treated as the final purchaser of the portion of these services that is not sold to the public.

Government gross investment is a measure of the additions to, and replacements of, the stock of government-owned fixed assets.[10] It consists of investment by both general government and government enterprises in structures (such as highways and schools), in equipment (such as military hardware), and in intellectual property products (software and research and development), and it includes own-account investment by government.

Federally funded expenditures for research and development (R&D) are treated as government investment, regardless of whether the R&D is protected or made freely available to the public, because the provision of public services is part of the economic benefits generated by government R&D.[11] Federally funded R&D is supported through purchases or through grants. For purchases, ownership by the federal government is usually straightforward, because the federal government normally retains ownership of the outcome of the purchased R&D. For grants, both the federal government and the performer of the R&D can benefit from the transaction, but they are treated as federal government R&D because the federal government receives economic benefits and because of the difficulty in distinguishing ownership between the funder and the performer of the R&D in the source data.

Table 9.2 shows the types of transactions that are included in, and excluded from, government consumption expenditures and gross investment.

[10] Unlike measures of gross private domestic investment, government gross investment excludes the change in inventories. Government expenditures on inventories are treated as current account purchases because data are generally not available to produce a comprehensive measure of government inventory investment or of inventory depreciation.

[11] This treatment is consistent with recommendations of the *SNA 2008* paragraphs 6.230, 10.103.

Table 9.2—Content of Government Consumption Expenditures and Gross Investment

Category of expenditure	Comments
Consumption expenditures	Valued as gross output, based on costs of inputs, of federal and of state and local general government less sales to other sectors and own-account investment. Includes services that are provided to the general public free of charge or at below market prices; they may be consumed "collectively" (such as public safety) or "individually" (such as health care). Includes changes in the inventories of the Commodity Credit Corporation (CCC) and of the Strategic Petroleum Reserve (SPR). Excludes gross output and sales of federal and of state and local government enterprises, which are recorded in the business sector.
Gross investment	Consists of federal and of state and local government investment in fixed assets. Includes net purchases (purchases less sales) of fixed assets from other sectors of the economy. Includes own-account investment—that is, production of fixed assets by government for its own use. Includes investment by federal and by state and local government enterprises. Excludes inventory investment; as noted above, investment in CCC and SPR inventories is included in government consumption expenditures.

Recording in the NIPAs

As described in chapter 2, the NIPAs can be viewed as aggregations of accounts belonging to individual transactors in the economy. Government consumption expenditures and gross investment represents aggregate final demand by federal and state and local governments. In the seven summary accounts of the NIPAs, it appears as a component of final expenditures in the Domestic Income and Product Account (account 1). In the Government Receipts and Expenditures Account (account 4), government consumption expenditures appears as a current expenditure. In the Domestic Capital Account (account 6), government fixed investment appears as a component of gross domestic investment; in addition, government CFC is added to net saving in the calculation of gross saving.

NIPA table group 3.9 shows government consumption expenditures and gross investment. NIPA table group 3.10 shows government consumption expenditures as gross output of general government less own-account investment and sales to other sectors. Detail on national defense consumption expenditures and gross investment is shown in NIPA table group 3.11. Annual estimates of government consumption expenditures and gross investment by function—that is, by the purposes or objectives for which the expenditures are made—are shown in NIPA table group 3.15. Annual estimates of gross government fixed investment by type are shown in table group 5.9.

The following is a list of the principal NIPA tables that present the estimates of government consumption expenditures and gross investment:

3.9.1 Percent Change From Preceding Period in Real Government Consumption Expenditures and Gross Investment

3.9.2 Contributions to Percent Change in Real Government Consumption Expenditures and Gross Investment
3.9.3 Real Government Consumption Expenditures and Gross Investment, Quantity Indexes
3.9.4 Price Indexes for Government Consumption Expenditures and Gross Investment
3.9.5 Government Consumption Expenditures and Gross Investment
3.9.6 Real Government Consumption Expenditures and Gross Investment, Chained Dollars
3.10.1 Percent Change From Preceding Period in Real Government Consumption Expenditures and General Government Gross Output
3.10.3 Real Government Consumption Expenditures and General Government Gross Output, Quantity Indexes
3.10.4 Price Indexes for Government Consumption Expenditures and General Government Gross Output
3.10.5 Government Consumption Expenditures and General Government Gross Output
3.10.6 Real Government Consumption Expenditures and General Government Gross Output, Chained Dollars
3.11.1 Percent Change From Preceding Period in Real National Defense Consumption Expenditures and Gross Investment by Type
3.11.2 Contributions to Percent Change from Preceding Period in Real National Defense Consumption Expenditures and Gross Investment by Type
3.11.3 Real National Defense Consumption Expenditures and Gross Investment by Type, Quantity Indexes
3.11.4 Price Indexes for National Defense Consumption Expenditures and Gross Investment by Type
3.11.5 National Defense Consumption Expenditures and Gross Investment by Type
3.11.6 Real National Defense Consumption Expenditures and Gross Investment by Type, Chained Dollars
3.15.1 Percent Change From Preceding Period in Real Government Consumption Expenditures and Gross Investment by Function
3.15.2 Contributions to Percent Change in Real Government Consumption Expenditures and Gross Investment by Function
3.15.3 Real Government Consumption Expenditures and Gross Investment by Function, Quantity Indexes
3.15.4 Price Indexes for Government Consumption Expenditures and Gross Investment by Function
3.15.5 Government Consumption Expenditures and Gross Investment by Function
3.15.6 Real Government Consumption Expenditures and Gross Investment by Function, Chained Dollars
3.16 Selected Government Current and Capital Expenditures by Function
5.9.3 Real Gross Government Fixed Investment by Type, Quantity Indexes
5.9.4 Price Indexes for Gross Government Fixed Investment by Type
5.9.5 Gross Government Fixed Investment by Type
5.9.6 Real Gross Government Fixed Investment by Type, Chained Dollars

BEA also prepares estimates of government consumption expenditures and gross investment that are not seasonally adjusted; these are available in Section 8 of the NIPA Interactive Data Tables. The tables present nominal, or "current-dollar" measures, "real," or inflation-adjusted measures, and price indexes. Current-dollar estimates of government current receipts and expenditures that are not seasonally adjusted are also available in this section.

In addition, estimates of investment by government in fixed assets are presented as part of BEA's fixed assets and consumer durable goods accounts.[12]

Overview of Source Data and Estimating Methods

As described earlier in the handbook, the NIPA estimates, including those for government consumption expenditures and gross investment, are prepared using a wide variety of source data (see "Chapter 3: Principal Source Data") and using estimating methods that adjust the source data to the required NIPA concepts and that fill in gaps in coverage and timing (see "Chapter 4: Estimating Methods"). Tables 9.A (government consumption expenditures) and 9.B (gross investment) at the end of this chapter summarize the source data and estimating methods that are used to prepare the current-dollar benchmark estimates, nonbenchmark annual estimates, and current quarterly estimates, as well as the quantity and price indexes, for the categories shown in NIPA table groups 3.9 and 3.10. The source data and methods for the current quarterly estimates reflect both seasonally adjusted and not seasonally adjusted estimates unless otherwise noted.

The estimates of government consumption expenditures and gross investment are prepared separately for the federal government and for the combined state and local governments.[13]

- For the federal government, the major sources for the estimates of consumption expenditures and gross investment are federal financial documents, primarily the *Budget of the United States Government*, an annual document published by the Executive Office of the President, and the Department of the Treasury's *Monthly Treasury Statement of Receipts and Outlays* (MTS), which presents monthly data on federal agency expenditures in a budget framework but in considerably less detail than is available in the fiscal year budget. Additional source data come from many federal agencies, including the Department of Defense (DOD), the Social Security Administration (SSA), the Office of Personnel Management, and the Bureau of Labor Statistics (BLS).

[12] These estimates are available on BEA's website at www.bea.gov.

[13] In general, the NIPA estimates for state government and for local government are combined. However, aggregate annual estimates of current-dollar consumption expenditures and of current-dollar gross investment are provided separately for state government and for local government in NIPA tables 3.20 and 3.21, respectively. These tables of state government and of local government receipts and expenditures are published a few months after the initial release of the NIPA annual update.

- For state and local government, the estimates of consumption expenditures and gross investment are primarily based on information collected by the U.S. Census Bureau in the quinquennial *Census of Governments* and in the annual *Surveys of State and Local Government Finances*. Additional data come from many other federal agencies and from a number of private sources.

Benchmark-year and nonbenchmark-year estimates

Federal

In general, the benchmark and nonbenchmark annual NIPA estimates are prepared using data from U.S. Treasury financial reports and agency administrative reports in conjunction with detailed information from BEA's translation of the President's budget into a NIPA basis (see the box "NIPA Translation of the Federal Budget" below). The budget translation provides a detailed array of NIPA expenditures by program and by type of expenditure that is used as the basis for allocating the data on program outlays from the MTS to consumption expenditures and gross investment and to other expenditures, such as social benefits and subsidies. Supplemental data from other government sources are then used to estimate spending by type of consumption expenditure and gross investment.

Estimates of federal government consumption expenditures and gross investment are prepared separately for defense and for nondefense. The defense category consists of the activities covered by the national defense function in the budget—that is, DOD military activities, defense-related atomic energy activities of the Department of Energy, and defense-related activities of other agencies. The nondefense category consists of the other consumption and investment activities in the budget.

NIPA Translation of the Federal Budget

Each year, BEA prepares a "translation" of the information in the President's fiscal year budget into a NIPA framework (see the annual article on the NIPA translation of the federal budget, which is usually published in the March issue of the *Survey of Current Business*). Unlike the federal budget, which is a financial plan of the government, the NIPA federal-sector estimates are designed to facilitate macroeconomic analyses of the effects of federal government activity on economic activity. The translation is based on actual budget data on receipts and outlays for the preceding fiscal year and on projected and proposed receipts and outlays for the current and the next fiscal year.

In translating the budget data into the framework of the NIPAs, three primary types of adjustments are made. These adjustments result in NIPA estimates of current receipts and expenditures that differ from corresponding estimates of receipts and expenditures in the budget.

- Coverage adjustments account for certain transactions that are included in the budget but are excluded from the NIPAs (and vice versa). For example, the NIPA estimates include consumption of fixed capital, but the budget does not.
- Netting and grossing adjustments account for certain transactions that are recorded as offsets to outlays in the budget but are recorded as receipts in the NIPAs (and vice versa).
- Timing adjustments account for certain transactions that are recorded on a cash basis in the budget but are recorded on an accrual basis in the NIPAs.

Defense estimates. For most categories of defense consumption expenditures other than compensation and CFC, the federal budget information is supplemented with detailed data from DOD production and financial reports. For many goods and for some services, the estimates are prepared using a "direct-pricing" method—that is, as the product of a delivered quantity times the actual price paid.[14]

For compensation, the estimates of wages and salaries of military employees are based on federal budget data, and the estimates of supplements are primarily based on data from SSA and DOD, including the actuarial report for the military retirement fund. The estimates of wages and salaries of civilian defense employees are based on data from the BLS quarterly census of employment and wages (QCEW), and the estimates of supplements are based on data from SSA, from the Office of Personnel Management, including actuarial reports for the major civilian employee retirement plans, and from the Thrift Investment Board. The estimates of CFC are derived using the perpetual inventory

[14] For more information, see *MP-5: Government Transactions*, II-33.

method—where investment flows are cumulated over time to derive estimates of stocks, which are then depreciated (see "Perpetual inventory method" in chapter 4).[15]

For most categories of defense gross investment, the federal budget information is supplemented with detailed data from DOD production and financial reports. Whenever possible, the direct-pricing method is used to prepare the estimates. The estimates of defense research and development (R&D) are based on R&D expenditures data from the National Science Foundation's (NSF) annual Survey of Federal Funds for Research and Development.

Nondefense estimates. For most categories of nondefense consumption expenditures other than compensation and CFC, the estimates are primarily based on the federal budget data.

For compensation, the estimates of wages and salaries for federal nondefense employees are based on QCEW data, and the estimates of supplements are primarily based on data from SSA, from the Office of Personnel Management, including actuarial reports for the major civilian employee retirement plans, and from the Thrift Investment Board. As above, the estimates of CFC are derived using the perpetual inventory method.

For nondefense gross investment, the estimates for structures are primarily based on Census Bureau construction statistics, and the estimates for equipment are primarily based on federal budget data, supplemented with data from various federal agencies when available. The benchmark-year estimates for software are primarily based on receipts data from the Census Bureau's economic census, and the estimates for nonbenchmark years are primarily based on receipts data from the Census Bureau's Service Annual Survey The estimates for research and development (R&D) are based on R&D expenditures data from the following NSF annual surveys: the Survey of Federal Funds for Research and Development and the Higher Education Research and Development Survey. As explained earlier, federal purchases of, and grants for, R&D are both treated as investment by the federal sector.

Estimates by function. The annual estimates of federal government consumption expenditures and gross investment by function are prepared on the basis of functional classifications for each appropriation in the federal budget. The portions of spending for all appropriations that are estimated by BEA to be consumption expenditures and gross investment are summed by budget function and then aggregated into classifications that are largely consistent with the System of National Account's "Classification of the Functions of Government" (COFOG). Sales of government services by appropriation are also assigned to budget functions and are subtracted from gross expenditures. In addition, a BEA estimate of CFC is added to each function.[16]

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[15] For more information on the derivation of the CFC estimates for government fixed assets, see *Fixed Assets and Consumer Durable Goods in the United States, 1925–97*, September 2003.

[16] See Karl Galbraith, "Government Spending by Function: A New Presentation," *Survey* 80 (June 2000): 18–23. See also Bruce E. Baker, Pamela A. Kelly, and Brooks B. Robinson, "Estimates of Real

State and local

The annual estimates for state and local government, other than those for compensation and for CFC, are primarily based on compilations of financial data from the *Census of Governments* (COG) and from *Surveys of State and Local Government Finances* (GF); these data are supplemented with data from other sources.

- The COG is a voluntary census that is conducted in the same year as the Economic Census. It covers all the states and over 90,000 local governments—including, counties, municipalities, townships, special districts, and school districts. Data are reported for each government's annual accounting period (fiscal year) that ends on or before June 30 of the census year.
- The GF data are compiled from three sources: an enumeration of all the states, a sample survey of local governments, and data from federal government agencies. Data are reported for each government's fiscal year that ends on or before June 30 of the survey year.

Generally, it takes about 2 years from the close of each fiscal year for final tabulations of the COG and GF data to become available. Because the fiscal years for many state and local governments do not coincide with the calendar year, the incorporation of the COG/GF data may affect the estimates for more than one calendar year. For example, in the 2020 annual update of the NIPAs, the estimates for calendar year 2017 (the third annual update of those estimates) were prepared using final FY 2017 GF data, and preliminary FY 2018 data. The estimates for calendar year 2018 (the second annual update of those estimates) were prepared using preliminary FY 2018 data and BEA projections for FY 2019. The estimates for calendar year 2019 (the first annual update of those estimates) were based on BEA projections for FY 2019 and FY 2020.

For compensation, the estimates of wages and salaries for state and local government employees are based on QCEW data. Estimates of accrual-based pension contributions are drawn from a sample of actuarial reports from state pension systems. Other estimates of supplements are primarily based on data from the SSA, from the Department of Labor, from the COG/GF, and from the Agency for Healthcare Research and Quality. For CFC, the estimates are derived using the perpetual inventory method.

Estimates by function. The annual estimates of state and local government consumption expenditures and gross investment by function are based on COG/GF data by function. These data are adjusted to conform to NIPA accounting concepts and then sorted into COFOG-based functions. The COG/GF data are supplemented with data from other sources. In addition, a BEA estimate of CFC is added to each function.[17]

Government Consumption Expenditures and Gross Investment by Function for 1959–2003," *Survey* 84 (October 2004): 5–10.

[17] See Galbraith, 18–23, and see also Baker, Kelly, and Robinson, 5–10.

Current quarterly estimates

Source data that underlie the estimates of federal and state and local government consumption expenditures and gross investment include a variety of seasonally-adjusted and unadjusted data. BEA tests the estimates for seasonality using the Census X-13 ARIMA program, and it seasonally adjusts them wherever seasonality is found. For those estimates where no seasonality is detected, the seasonally adjusted estimates are equal to the not seasonally adjusted estimates.

In most cases, the not seasonally adjusted estimates of federal and state and local government consumption expenditures and gross investment are derived using the same source data and methods that underlie the seasonally adjusted estimates. Where different source data are used, the difference is noted in tables 9.A and 9.B.

Federal

For defense consumption expenditures other than compensation and CFC, the current quarterly estimates for most categories are based on MTS data on budget outlays and on DOD data from financial reports on disbursements and are supplemented with other information from DOD when available.

For nondefense consumption expenditures other than compensation and CFC, the current quarterly estimates for most categories of goods are based on MTS data on budget outlays. The estimates for most categories of services are based on judgmental trend.

Although the MTS is the primary source for many of the NIPA estimates of federal consumption expenditures, it is important to note that critical differences in definition and coverage limit the usefulness of the MTS as an early indicator of movements in the NIPA measures. For example, current transfer payments, which account for a significant part of the federal budget, are not counted as production and are therefore excluded from the NIPA measures of consumption expenditures.[18]

For compensation, the current quarterly estimates for military employees are based on DOD employment data. The estimates for civilian defense employees and for nondefense employees are based on an indicator series that is derived using changes in BLS current employment statistics. For CFC, the estimates are derived as part of the perpetual inventory method that is used to prepare BEA's estimates of the net stocks of fixed assets.

For defense gross investment, the current quarterly estimates for most categories are primarily based on MTS data on outlays and on DOD data from financial reports on disbursements and are supplemented with other information from DOD when available.

[18] For more information, see the box "The Monthly Treasury Statement and BEA's Estimates of Federal Government Spending," in "Business Situation: Advance Estimates for the Fourth Quarter of 2005 and for 2005," *Survey* 86 (February 2006): 6.

For nondefense gross investment, the estimates of structures are primarily based on Census Bureau monthly construction statistics, and the estimates of equipment and intellectual property products are primarily based on government agency data or on judgmental trend.

State and local

For most categories of state and local consumption expenditures other than compensation and CFC, the current quarterly estimates are derived by first preparing the quantity estimates and then "reflating" those estimates to current dollars by multiplying them by appropriate price indexes (generally BLS producer price indexes or consumer price indexes).

For compensation, the current quarterly estimates are based on an indicator series that is derived using changes in BLS current employment statistics and changes in the BLS employment cost index. For CFC, the estimates are derived as part of the perpetual inventory method that is used to prepare BEA's estimates of the net stocks of fixed assets.

For gross investment, the estimates for structures, which account for over three-fourths of total investment, are based on Census Bureau monthly construction statistics. The estimates for investment in motor vehicles reflect monthly data on new motor vehicle registrations by state and local governments from R.L. Polk and Company. The estimates for other equipment and for intellectual property products are primarily based on judgmental trend.

Quantity and price estimates

The estimates of quantities purchased, or real spending, for most of the detailed government consumption expenditures and gross investment categories except compensation and CFC are prepared by deflation. Under this method, the quantities are calculated by dividing the current-dollar value of the component by an appropriate price index (with the reference year set equal to 100). For many defense categories, particularly for equipment, BEA directly prepares detailed price indexes based on DOD delivery and price information. In addition, as mentioned above, the current quarterly quantity estimates for most of the state and local government components are prepared by quantity extrapolation. The quantity and price estimates of compensation for military employees are prepared by quantity extrapolation using an indicator derived from DOD employment data, and the quantity and price estimates for federal civilian employees and for state and local government employees are prepared by quantity extrapolation using an indicator derived from BLS employment data. (For a general description of the deflation and quantity extrapolation methods, see "Estimates for detailed components" in chapter 4 of this Handbook.)

The aggregate measures of government consumption expenditures and gross investment are calculated from the detailed components as chain-type quantity and price indexes (for information about these calculations, see “Estimates for NIPA aggregates” in chapter 4). BEA also prepares measures of real government consumption expenditures and gross investment and its components in a dollar-denominated form, designated “chained-dollar” estimates (see “Chained-dollar measures” in chapter 4).

Table 9.A—Summary of Methodology Used to Prepare Estimates of Government Consumption Expenditures

Line in NIPA table group 3.10	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates* (Indicator series used to extrapolate annual estimate)	
12	**Federal consumption expenditures:**			
23	**Defense consumption expenditures:** calculated as gross output of general government less own-account investment and sales to other sectors (line 24 less lines 32 and 33).			
24	**Gross output of general government:** calculated as value added plus intermediate goods and services purchased (line 25 plus line 28).			
25	**Value added:** calculated as compensation of general government employees plus consumption of general government fixed capital (line 26 plus line 27).			
26	Compensation of general government employees:			
	Military	Wages and salaries: federal budget data. Employer contributions for social insurance: SSA data for military personnel. Employer contributions for employee pension and insurance funds: the actuarial report for the military retirement fund from DOD and Thrift Investment Board data.	Wages and salaries: DOD data on military employment. Employer contributions for social insurance: BEA wages and salaries estimate. Employer contributions for employee pension and insurance funds: projections from the actuarial report for the military retirement fund from DOD, Thrift Investment Board data, BEA wages and salaries estimate, and federal budget data.	Quantity extrapolation using employment data from DOD.
	Civilian	Wages and salaries: QCEW data. Employer contributions for social insurance: SSA data for civilian personnel. Employer contributions for employee pension and insurance funds: OPM data, including actuarial reports for the major civilian employee retirement plans, and Thrift Investment Board data.	Wages and salaries: CES data on employment. Employer contributions for social insurance: BEA wages and salaries estimate. Employer contributions for employee pension and insurance funds: projections from actuarial reports for the major civilian retirement plans, CES data on employment, BEA wages and salaries estimate, and federal budget data.	Quantity extrapolation using BLS employment data.
27	Consumption of general government fixed capital	Perpetual inventory method based on gross investment estimates and on investment prices.	Same as for annual estimates.	Perpetual inventory method based on gross investment estimates and on investment prices.

Table 9.A—Summary of Methodology Used to Prepare Estimates of Government Consumption Expenditures

Line in NIPA table group 3.10	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates* (Indicator series used to extrapolate annual estimate)	
28	Intermediate goods and services purchased:			
29	Durable goods	Ships: MTS data on outlays. Other components: DOD financial reports on disbursements and DOD contract award data.	Ships: same as for annual estimates. Other components: DOD financial reports on disbursements when available, or MTS data on outlays.	Various PPIs, IPDs, and DOD price information.
30	Nondurable goods	Petroleum products: expenditures from DOD Defense Energy Support Center. Other components: DOD financial reports on disbursements and DOD contract award data.	Petroleum products: data from DOD Defense Finance and Accounting Services when available, or judgmental trend. Other components: DOD financial reports on disbursements when available, or judgmental trend.	Petroleum products: DOD price and quantity information. Other components: various PPIs.
31	Services	Installation support: U.S. Postal Service, DOD contract award, Communication Services Industrial Fund, and McNeil Technologies data. Weapons support: DOD financial reports on disbursements and DOD contract award data. Personnel support: DOD contract award data and BEA international transactions accounts data on payments to foreign nationals. Other components: Federal budget data.	Installation support: judgmental trend. Weapons support: DOD financial reports on disbursements when available, or judgmental trend. Personnel support: judgmental trend and, when available, BEA international transactions accounts data on payments to foreign nationals. Other components: judgmental trend.	Installation support: various PPIs, CPIs, and other price information. Weapons support: various BLS employment cost indexes and PPIs. Personnel support: various CPIs and other price information. Other components: various PPIs and other price information.
32	Less: Own-account investment	Structures: value put in place from MCS. Software: portion of national total for own-account software (see the technical note to "Chapter 6: Fixed Investment"). Research and development: NSF survey and federal budget data.	Structures: same as for annual estimates. Software: judgmental trend. Research and development: federal budget data.	Structures: various PPIs and other price information. Software: BEA own-account software intermediate inputs index and BEA nondefense compensation price index. Research and development: based on various BEA federal prices.
33	Less: Sales to other sectors	DOD financial reports on disbursements and MTS data on outlays.	DOD financial reports on disbursements when available, or MTS data on outlays.	IPD for military officers' compensation and various PPIs.

Table 9.A—Summary of Methodology Used to Prepare Estimates of Government Consumption Expenditures

Line in NIPA table group 3.10	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates* (Indicator series used to extrapolate annual estimate)	
34	**Nondefense consumption expenditures:** calculated as gross output of general government less own-account investment and sales to other sectors (line 35 less lines 45 and 46).			
35	**Gross output of general government:** calculated as value added plus intermediate goods and services purchased (line 36 plus line 39).			
36	**Value added:** calculated as compensation of general government employees plus consumption of general government fixed capital (line 37 plus line 38).			
37	Compensation of general government employees	Wages and salaries: QCEW data. Employer contributions for social insurance: SSA data. Employer contributions for employee pension and insurance funds: OPM data, including actuarial reports for the major civilian retirement plans, and Thrift Investment Board data.	Wages and salaries: CES data on employment. Employer contributions for social insurance: wages and salaries estimate. Employer contributions for employee pension and insurance funds: projections from actuarial reports for the major civilian employee retirement plans and CES data on employment.	Quantity extrapolation using BLS employment data.
38	Consumption of general government fixed capital	Perpetual inventory method based on gross investment estimates and on investment prices.	Same as for annual estimates.	Perpetual inventory method based on gross investment estimates and on investment prices.
39	Intermediate goods and services purchased:			
40	Durable goods	MTS data on outlays.	Same as for annual estimates.	Various PPIs and IPDs.
41	Nondurable goods:			
42	Commodity Credit Corporation (CCC) inventory change	CCC Inventory Operations by Commodities Report and the Donations Report from the U.S. Department of Agriculture.	Same as for annual estimates.	Direct valuation using market price data from the National Agricultural Statistics Service.
43	Other nondurable goods	Petroleum: McNeil Technologies data. Other components: MTS data on outlays.	Petroleum: judgmental trend. Other components: same as for annual estimates.	Petroleum: for Strategic Petroleum Reserve, direct valuation using Department of Energy prices and quantities; for other petroleum

Table 9.A—Summary of Methodology Used to Prepare Estimates of Government Consumption Expenditures

Line in NIPA table group 3.10	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates* (Indicator series used to extrapolate annual estimate)	
				purchases, PPI for light fuel oils, PPI for gasoline, and PPI for residual fuels. Other components: various PPIs.
44	Services	Financial services furnished without payment: commodity-flow method, primarily based on data from federal government agencies. Other components: federal budget data.	Financial services furnished without payment: for third estimate, data from federal government agencies; for second and advance estimates, judgmental trend. Other components: judgmental trend.	Financial services furnished without payment: for annual, quantity extrapolation using BLS banking output indexes; for quarterly, judgmental trend. Other components: various CPIs and PPIs.
45	Less: Own-account investment	Structures: value put in place from MCS. Software: portion of national total for own-account software (see the technical note to chapter 6). Research and development: NSF survey and federal budget data.	Structures: same as for annual estimates. Software: judgmental trend. Research and development: federal budget data.	Structures: various PPIs and other price information. Software: BEA own-account software intermediate inputs index and nondefense compensation price index. Research and development: based on various BEA federal prices.
46	Less: Sales to other sectors	U.S. Department of Agriculture, Strategic Petroleum Reserve, and MTS data on outlays.	Same as for annual estimates when available, or judgmental trend.	Various PPIs.
47	**State and local consumption expenditures:** calculated as gross output of general government less own-account investment and sales to other sectors (line 48 less lines 56 and 57).			
48	**Gross output of general government:** calculated as value added plus intermediate goods and services purchased (line 49 plus line 52).			
49	**Value added:** calculated as compensation of general government employees plus consumption of general government fixed capital (line 50 plus line 51).			
50	Compensation of general government employees	Wages and salaries: QCEW data. Employer contributions for social insurance: SSA, Department of Labor, and COG/GF data.	Wages and salaries: Seasonally adjusted: CES data on employment and BLS employment cost index. Not seasonally adjusted: judgmental trend.	Seasonally adjusted: Quantity extrapolation, primarily using BLS employment data. Not seasonally adjusted: judgmental trend.

Table 9.A—Summary of Methodology Used to Prepare Estimates of Government Consumption Expenditures

Line in NIPA table group 3.10	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates* (Indicator series used to extrapolate annual estimate)	
		Employer contributions for employee pension funds: actuarial reports from state pension plans. Other contributions: primarily data from COG/GF and from the Medical Expenditure Panel Survey conducted by the Agency for Healthcare Research and Quality.	Employer contributions for social insurance: BEA wages and salaries estimate and judgmental trend. Employer contributions for employee pension funds: BEA wages estimate. Other contributions: judgmental trend.	
51	Consumption of general government fixed capital	Perpetual inventory method based on gross investment estimates and on investment prices.	Judgmental trend.	Perpetual inventory method based on gross investment estimates and on investment prices.
52	Intermediate goods and services purchased:			
53	Durable goods	COG/GF, Bowker, and Association of American Publishers data on purchases.	Judgmental trend.	Various CPIs and PPIs.
54	Nondurable goods	COG/GF data on purchases.	Judgmental trend.	Various CPIs and PPIs.
55	Services	Financial services furnished without payment: commodity-flow method, primarily based on data from federal government agencies and financial industry sources (see the technical note to "Chapter 5: Personal Consumption Expenditures"). Other components: COG/GF data on purchases.	Financial services furnished without payment: for third estimate, same as for annual estimates; for second and advance estimates, judgmental trend. Other components: judgmental trend.	Financial services furnished without payment: quantity extrapolation using BLS banking output indexes and various PPIs. Other components: various CPIs and PPIs.
56	Less: Own-account investment	Structures: primarily based on COG/GF data. Software: portion of national total for own-account software (see the technical note to chapter 6). Research and development: NSF survey data.	Structures: compensation of general government employees. Other components: judgmental trend.	Structures: various CPIs, PPIs, and IPDs. Software: BEA own-account software intermediate inputs index. Research and development: BEA academic and nonacademic aggregate composite input-cost indexes.
57	Less: Sales to other sectors:			

Table 9.A—Summary of Methodology Used to Prepare Estimates of Government Consumption Expenditures

Line in NIPA table group 3.10	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates* (Indicator series used to extrapolate annual estimate)	
58	Tuition and related educational charges	COG/GF data.	Judgmental trend.	Various CPIs and PPIs.
59	Health and hospital charges	COG/GF and SAS data.	Judgmental trend.	Various CPIs and PPIs.
60	Other sales	Research and development: NSF survey and federal budget data. Other components: COG/GF data.	Research and development: federal budget data. Other components: judgmental trend.	Research and development: BEA academic and nonacademic aggregate composite input-cost indexes. Other components: various CPIs and PPIs.

* For state and local government series, the current quarterly estimates are prepared by extrapolating the annual quantity estimate, either using an indicator series or judgmentally, to derive the quarterly quantity estimate and then reflating that estimate using an appropriate price index.

BEA Bureau of Economic Analysis
BLS Bureau of Labor Statistics
CES Current Employment Statistics, BLS
COG/GF Census of Governments and Annual Surveys of Government Finances, Census Bureau
CPI Consumer Price Index, BLS
DOD Department of Defense
IPD Implicit Price Deflator, BEA
MCS Monthly construction statistics, Census Bureau
MTS *Monthly Treasury Statement*, Department of the Treasury
NIPAs National Income and Product Accounts, BEA
NSF National Science Foundation
OPM Office of Personnel Management
PPI Producer Price Index, BLS
QCEW Quarterly Census of Employment and Wages, BLS
SAS Service Annual Survey, Census Bureau
SSA Social Security Administration

Table 9.B—Summary of Methodology Used to Prepare Estimates of Government Gross Investment

Line in NIPA table group 3.9, 3.11	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates (Indicator series used to extrapolate annual estimates)	
9	**Federal:**			
17, 29	**National defense:**			
11, 30	Structures:			
	Residential	DOD financial reports on disbursements.	DOD financial reports on disbursements when available, or MTS data on outlays.	Census Bureau single-family houses under construction index.
	Industrial	Primarily based on value put in place from MCS.	Same as for annual estimates.	Unweighted average of Turner Construction Co. building cost index, FHWA highway structures construction index, and Census Bureau single-family houses under construction index.
	Military facilities	DOD financial reports on disbursements.	DOD financial reports on disbursements when available, or MTS data on outlays.	Weighted average of Turner Construction Co. building cost index, FHWA composite index for highway construction, Census Bureau single-family houses under construction index, and Bureau of Reclamation composite index of construction costs.
	Net purchases of used structures	Based on data from GSA and DOD.	Judgmental trend.	Unweighted average of Turner Construction Co. building cost index, FHWA composite index for highway construction, FHWA highway structures construction index, Census Bureau single-family houses under construction index, and Bureau of Reclamation composite index of construction costs.
12, 31	Equipment:			
32	Aircraft	DOD production control reports, “budget exhibit” data, and financial reports on disbursements.	DOD production control reports, “budget exhibit” data, and financial reports on disbursements when available, or MTS data on outlays.	DOD production control reports, DOD “budget exhibit” data, and various PPIs.

Table 9.B—Summary of Methodology Used to Prepare Estimates of Government Gross Investment

Line in NIPA table group 3.9, 3.11	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates (Indicator series used to extrapolate annual estimates)	
33	Missiles	DOD production control reports, "budget exhibit" data, and financial reports on disbursements.	DOD production control reports, "budget exhibit" data, and financial reports on disbursements when available, or MTS data on outlays.	DOD production control reports, DOD "budget exhibit" data, and various PPIs and IPDs.
34	Ships	MTS data on outlays.	Same as for annual estimates.	Various PPIs.
35	Vehicles	DOD production control reports, "budget exhibit" data, and financial reports on disbursements.	DOD production control reports, "budget exhibit" data, and financial reports on disbursements when available, or MTS data on outlays.	DOD production control reports, DOD "budget exhibit" data, and various PPIs and IPDs.
36	Electronics	DOD financial reports on disbursements, DOD contract awards data, and data from the Federal Procurement Data System.	DOD financial reports on disbursements when available, or MTS data on outlays.	Various PPIs and IPDs.
37	Other equipment	DOD financial reports on disbursements.	DOD financial reports on disbursements when available, or MTS data on outlays.	Various PPIs.
38	Intellectual property products:			
39	Software	For benchmark year, BEA's benchmark input-output accounts, primarily based on receipts data from Census Bureau economic census; for nonbenchmark years, primarily based on SAS receipts data.	For third estimate, QSS total revenue data; for second and advance estimates, receipts from company reports to the Security and Exchange Commission.	BEA price/cost index for custom software.
40	Research and development	NSF survey and federal budget data.	Federal budget data.	Based on various BEA federal prices and on BEA academic and nonacademic aggregate composite input-cost indexes.
27	**Nondefense:**			
28	Structures:			
	New	Primarily based on value put in place from MCS.	Same as for annual estimates.	PPI for new health care building construction, PPI for new office building construction, PPI for new school building construction, and PPI for other nonresidential construction; Turner

Table 9.B—Summary of Methodology Used to Prepare Estimates of Government Gross Investment

Line in NIPA table group 3.9, 3.11	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates (Indicator series used to extrapolate annual estimates)	
				Construction Co. building cost index; Census Bureau single-family houses under construction index; Bureau of Reclamation composite index of constructions costs; Handy-Whitman construction cost indexes; various IPDs.
	Net purchases of used structures	Based on data from GSA, Federal Housing Administration, and the Veterans' Administration.	Judgmental trend.	Unweighted average of Turner Construction Co. building cost index, FHWA composite index for highway construction, FHWA highway structures construction index, Census Bureau single-family houses under construction index, and Bureau of Reclamation composite index of construction costs.
29	Equipment	Computers: GSA data. Aerospace equipment: Federal budget data. Vehicles: GSA data. Enterprise equipment: Federal budget data.	Computers: same as for annual estimates. Aerospace equipment: judgmental trend. Vehicles: same as for annual estimates. Enterprise equipment: judgmental trend.	Computers: various IPDs. Aerospace equipment: various PPIs. Vehicles: various PPIs. Enterprise equipment: various PPIs.
30	Intellectual property products:			
31	Software	For benchmark year, BEA's benchmark I-O accounts, primarily based on receipts data from Census Bureau economic census; for nonbenchmark years, primarily based on SAS receipts data.	For third estimate, QSS total revenue data; for second and advance estimates, receipts from company reports.	BEA price/cost index for custom software and various PPIs.
32	Research and development	NSF survey and federal budget data.	Federal budget data.	Based on various BEA federal prices and on BEA academic and nonacademic aggregate composite input-cost indexes.
35	**State and local:**			
36	Structures:			
	New	Primarily based on COG/GF data.	Value put in place from MCS.	PPI for new health care building construction, PPI for new office building construction, PPI for new school building

Table 9.B—Summary of Methodology Used to Prepare Estimates of Government Gross Investment

Line in NIPA table group 3.9, 3.11	Component	Current-dollar estimates		Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
		Benchmark-year and nonbenchmark-year estimates	Current quarterly estimates (Indicator series used to extrapolate annual estimates)	
				construction, PPI for new industrial building construction, and PPI for highway construction; Turner Construction Co. building cost index, Census Bureau single-family houses under construction index, Bureau of Reclamation composite index of construction costs, and Handy-Whitman construction cost indexes.
	Net purchases of used structures	COG/GF data.	Judgmental trend.	BEA price indexes for new private nonfarm residential structures, for new private farm residential structures, and for new private nonresidential structures.
37	Equipment	Computers and peripheral equipment: for benchmark year, BEA's benchmark I-O accounts, primarily based on manufacturers' shipments from Census Bureau economic census; for nonbenchmark years, primarily based on shipments data from Census Bureau Annual Survey of Manufactures. Motor vehicles: registration data from R.L. Polk and company and unit price data from J.D. Power and Assoc. Other components: COG/GF data.	Computers and peripheral equipment: primarily based on shipments from Census Bureau monthly Survey of Manufacturers' Shipments, Inventories, and Orders and from Federal Reserve Board industrial production index. Motor vehicles: same as for annual estimates. Other components: judgmental trend.	Computers and peripheral equipment: BEA price index for investment in computers and peripheral equipment. Motor vehicles: registration data. Other components: various PPIs.
38	Intellectual property products:			
39	Software	For benchmark year, BEA's benchmark I-O accounts, primarily based on receipts data from Census Bureau economic census; for nonbenchmark years, primarily based on SAS receipts data.	For third estimate, QSS total revenue data; for second and advance estimates, receipts from company reports.	BEA price index for custom software and various PPIs.
40	Research and development	NSF survey data.	Judgmental trend.	BEA academic and nonacademic aggregate composite input-cost indexes.

BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
COG/GF	Census of Governments and Annual Surveys of Government Finances, Census Bureau
CPI	Consumer Price Index, BLS
DOD	Department of Defense
FHWA	Federal Highway Administration
GSA	Government Services Administration
IPD	Implicit Price Deflator, BEA
MCS	Monthly construction statistics, Census Bureau
MTS	*Monthly Treasury Statement*
NIPAs	National Income and Product Accounts, BEA
PPI	Producer Price Index, BLS
QSS	Quarterly Services Survey, Census Bureau
SAS	Service Annual Survey, Census Bureau

CHAPTER 10: COMPENSATION OF EMPLOYEES

(Updated: October 2019)

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Appendix A: NIPA Measures of Employment and Hours

Compensation measures the total income—both wages and salaries and supplements to wages and salaries—earned by employees in return for contributing to production during an accounting period. It is the largest component of gross domestic income (GDI), of national income, and of personal income in the U.S. national income and product accounts (NIPAs). Compensation estimates are an integral part of the NIPAs, a set of accounts that provides a logical and consistent framework for presenting statistics on U.S. economic activity (see "Chapter 2: Fundamental Concepts").

BEA's measures of compensation provide comprehensive and consistent economic measures of the income earned by all U.S. workers. In contrast to other available measures of compensation, the NIPA measures include not just wages and salaries but also noncash benefits—such as employer contributions to pension plans, to health insurance, and to social insurance programs. Thus, the NIPA measures of compensation are particularly useful in analyses of labor's share in the functional distribution of income. Additionally, unit labor costs—the ratio of compensation to real output—is an important indicator of potential inflation. Moreover, analyses of the components and supporting detail underlying the compensation measures are useful for considering the differences between the individual experiences of households and the picture of the economy captured in broader aggregates such as GDP and personal income. The estimates of wages and salaries—the largest component of compensation—are critical for projecting federal budgets and Social Security trust fund balances.[1]

Additionally, BEA prepares associated measures of employment and hours. While the Bureau of Labor Statistics (BLS) is the principal provider of information on the labor market in the United States (including detailed data on employment, hours, and earnings), BEA's

[1] See J. Steven Landefeld, Brent R. Moulton, Joel D. Platt, and Shaunda M. Villones, "GDP and Beyond: Measuring Economic Progress and Sustainability," *Survey of Current Business* 90 (April 2010): 12-25.

supplemental measures are consistent with the NIPA compensation measures and therefore facilitate analyses of NIPA-based compensation and productivity by employee. These measures are described in appendix A to this chapter; they include full-time equivalent employees and hours worked.

Definitions and Concepts

Compensation measures the total remuneration, in cash or in kind, that accrues to employees in return for their work during the accounting period, regardless of when they are paid. As such, the NIPA treatment of compensation is consistent with the treatment recommended by the *System of National Accounts 2008* (SNA), in which compensation reflects total remuneration and is measured on an accrual basis.[2] Compensation consists of the earnings of employees, but it does not include the earnings of the self-employed, which the NIPAs treat as proprietors' income (and the SNA treats as mixed income).

Compensation is equal to the sum of *wages and salaries* and of *supplements to wages and salaries.* Wages and salaries, which generally accounts for over 80 percent of compensation, consists of cash remuneration of labor (including sick or vacation pay, severance pay, commissions, tips, and bonuses), and in-kind remuneration of labor such as transit subsidies and meals. Supplements to wages and salaries consists of employer payments that are made on behalf of employees but are not included in the regular wage payments provided directly to employees—specifically, *employer contributions for employee pension and insurance funds* and *employer contributions for government social insurance.* Because these payments are made for the benefit of employees and because the value of the contributions is typically determined, in some fashion, by their labor, they are treated as compensation. Table 10.1 shows the kinds of transactions that are included in, and excluded from, compensation of employees.

Table 10.1—Content of Compensation of Employees

Category of transaction	Comments
Wages and salaries in cash	Includes monetary wages and salaries payable by employers to employees and to corporate officers at regular intervals, including piecework payments; overtime or unusual-hour payments; payments for periods away from work due to temporary discontinuation of production, such as holidays or absences for illness; allowances for unusual location or conditions; early retirement (buyout) payments; severance pay; jury, witness, and other compensatory fees; and regular

[2] See Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and the World Bank, *System of National Accounts 2008*: paragraph 7.5. For a discussion of the accrual and cash methods of accounting, see "Accounting principles" in chapter 2 of this handbook.

	supplementary allowances, such as housing allowances.[3] Includes incentive payments, commissions, tips, and bonuses payable to employees and to corporate officers. Includes employee gains from exercising nonqualified stock options (NSOs).[4] Includes wages and salaries paid to employees of unincorporated enterprises. Excludes the income received by the owners or associated household members of unincorporated enterprises, which is treated as proprietors' income. Excludes the income received by tax-exempt cooperatives, which is treated as proprietors' income. Excludes reimbursement by employers of expenditures made by employees in order to carry out their work (such as purchases of tools and equipment), which are treated as intermediate expenditures by the employer.
Wages and salaries in kind	Includes employer-provided in-kind earnings, such as transit subsidies, meals, and lodging. Excludes goods or services that employers must provide in order for employees to perform their work, which are treated as intermediate expenditures by the employer.
Supplements to wages and salaries	Includes employer contributions for employee pension and insurance funds: private pension plans, government employee pension plans, private insurance funds such as group health and life insurance, workers' compensation, supplemental unemployment insurance, and publicly administered government employee insurance plans. Includes employer contributions for government social insurance: old age, survivors, and disability insurance (social security); hospital insurance; unemployment insurance; railroad retirement; pension benefit guaranty; veterans life insurance; workers' compensation; military medical insurance; and temporary disability insurance.

Employers provide employees with pension benefits largely through two mechanisms:

- Defined contribution plans provide benefits during retirement based on the amount of money that has accumulated in an employee's account as a result of employer and employee contributions to the plans and the income earned from investment of the plans' assets.
- Defined benefit plans provide benefits during retirement based on a formula that typically depends on an employee's length of service and average pay, among

[3] The source data underlying the estimates of wages and salaries do not provide the separate estimates of severance payments or of payments for time away due to illness or injury that are required for excluding them from compensation (as the SNA recommends), so they are included in the NIPA measures of compensation.

[4] NSOs are regarded as additional, taxable, income at the time they are exercised; in contrast, incentive stock options do not require the reporting of additional income and are taxed as long-term capital gains when sold. The detailed data required for treating NSOs as compensation of employees when the options are granted (as the SNA recommends) are not currently available. Instead, NSOs are valued at the time that they are exercised, and the difference between the market price at the time of the exercise and the price paid by the employee at the time of the exercise is recorded as wages and salaries. For a discussion of the SNA recommendations and BEA's research on NSOs, see Carol E. Moylan, "Employee Stock Options and the National Economic Accounts," *Survey* 88 (February 2008): 7-13.

other factors. To fund promised benefits to retirees, defined benefit plans primarily rely on contributions from employers and employees and on the income earned on the financial assets that the plans hold.

The contributions made by employers to both types of plans are included in supplements to wages and salaries; the interest and dividend income earned on the plans' financial assets are included in personal interest income.

The NIPAs provide two measures of compensation in order to distinguish the compensation earned by all of the employees of resident U.S. employers from the compensation earned by resident U.S. employees from all employers. "Compensation of employees, paid" is the NIPA measure of the compensation paid by U.S. resident employers to their resident and nonresident employees. That is, it excludes compensation received from the rest of the world, and it includes compensation paid to the rest of the world.[5] "Compensation of employees" is the NIPA measure of the compensation paid by resident and nonresident employers to U.S. resident employees. That is, it excludes compensation paid to the rest of the world, and it includes compensation received from the rest of the world.

Recording in the NIPAs

As described in chapter 2, the NIPAs can be viewed as aggregations of accounts belonging to individual transactors in the economy. In the seven summary accounts of the NIPAs, "compensation of employees, paid" appears as a component of GDI in the Domestic Income and Product Account (account 1) and "compensation of employees" appears in the Personal Income and Outlay Account (account 3) as a component of personal income. [6] Additionally, as "compensation of employees" reflects the compensation liabilities of both resident and nonresident employers, it appears as a component of national income.[7]

[5] Compensation paid to the rest of the world consists of compensation paid to foreign residents temporarily working in the United States (including undocumented migratory workers) and to Canadian and Mexican workers who commute to work in the United States. Compensation received from the rest of the world consists of compensation received by U.S. residents temporarily working abroad, working in foreign diplomatic installations, or working for international organizations in the United States, and by workers from the United States who commute to Mexico or Canada.

[6] In addition, compensation of general government employees is a product-side component of government consumption expenditures and gross investment in account 1; see "Chapter 9: Government Consumption Expenditures and Gross Investment" of this handbook for more information on the NIPA presentation of government as both a consumer/investor and a producer and on the measurement of government output as the sum of the cost of its inputs.

[7] For a discussion of the relationship between GDP, gross national product, national income, and other important NIPA aggregates, see "Major NIPA aggregates" in chapter 2 of this handbook. For a discussion of domestic and national measures of production, see "Geographic coverage" in chapter 2.

The NIPAs present current-dollar annual estimates of GDI by type of income, national income by type of income, and national income by sector and legal form of organization.

- The presentation of GDI by type of income includes "compensation of employees, paid" and selected aggregate components—wages and salaries to persons, wages and salaries to the rest of the world, and supplements to wages and salaries.
- The presentation of national income by type of income includes "compensation of employees" and selected aggregate components—wages and salaries for government and for the aggregate of all other sectors and supplements to wages and salaries from employer contributions for employee pension and insurance funds and from employer contributions for government social insurance.
- The presentation of national income by sector and legal form of organization also includes "compensation of employees" and selected aggregate components—wages and salaries and supplements to wages and salaries.

Additionally, annual estimates of "compensation of employees," wages and salaries, and the major components of supplements to wages and salaries are presented by industry.

The sector-specific estimates follow the NIPA sectors—business (including government enterprises), households and institutions, general government, and the rest of the world; within the business sector, the estimates by legal form are classified according to the Internal Revenue Service (IRS) filing requirements for corporate and noncorporate business.[8] The industry-specific estimates for 1998 forward are classified according to the North American Industry Classification System (NAICS) at the three-digit industry level, and the estimates prior to 1998 are classified according to the Standard Industrial Classification (SIC); the estimates for 1998-2000 are also available on an SIC basis.[9] The industry-specific estimates include estimates for federal general government (which includes both civilian employees and military personnel), for federal government enterprises, for state and local general government, and for state and local government enterprises.

Estimates of "compensation of employees, paid" and "compensation of employees" and certain aggregate components are also available quarterly. The following is a list of the principal NIPA tables that present current-dollar estimates of compensation as a component of GDI and of

[8] For descriptions of NIPA sectors and of legal forms of organization, see the section "Classification" in chapter 2 of this handbook.

[9] Time-series breaks caused by the conversion to NAICS and by previous revisions to the SIC are reflected in the separation of estimates into distinct tables for each range of estimates based on a different classification. For instance, table 6.2, Compensation of Employees by Industry, comprises four separate tables: table 6.2A, based on the 1942 SIC; table 6.2B, based on the 1972 SIC; table 6.2C, based on the 1987 SIC; and table 6.2D, based on the 2012 NAICS. For more information on the conversion from the SIC to NAICS, see John R. Kort, "The North American Industry Classification System in BEA's Economic Accounts," *Survey* 81 (May 2001): 7–13.

national income. [10]

1.10 Gross Domestic Income by Type of Income
1.11 Percentage Shares of Gross Domestic Income
1.12 National Income by Type of Income[11]
1.13 National Income by Sector, Legal Form of Organization, and Type of Income
6.2 Compensation of Employees by Industry
6.3 Wages and Salaries by Industry

Annual estimates of supplements to wages and salaries are also presented by industry and by detailed type of supplement in the following NIPA tables:

3.6 Contributions for Government Social Insurance[12]
6.10 Employer Contributions for Government Social Insurance by Industry
6.11 Employer Contributions for Employee Pension and Insurance Funds by Industry and by Type
7.8 Supplements to Wages and Salaries by Type

Separate receipts and expenditures accounts for defined benefit and defined contribution pension plans are presented annually in tables 7.20-7.25 for all plans, for all private defined benefit plans, for federal government defined benefit plans, for state and local defined benefit plans, and for all defined contribution plans, respectively.

Annual and quarterly estimates of wages and salaries paid to the rest of the world and wages and salaries received from the rest of the world are presented in "Table 4.1. Foreign Transactions in the National Income and Product Accounts."

BEA also prepares nominal, or "current-dollar" estimates of compensation of employees

[10] As a component of the product-side measure of government consumption expenditures and gross investment, BEA prepares real (inflation-adjusted) measures of the compensation of general government employees. For more information on the derivation of inflation-adjusted measures, see "Price and Quantity Estimates" in "Chapter 4: Estimating Methods." For more information on the derivation of real compensation of general government employees, see the section "Quantity and price estimates" in chapter 9, and see Bruce E. Baker and Pamela A. Kelly, "A Primer on BEA's Government Accounts," *Survey* 88 (March 2008): 29-38.

[11] The NIPAs also present annual and quarterly estimates of "compensation of employees" in NIPA table group 2 as a component of personal income. Annual and quarterly estimates of "compensation of employees" are available in NIPA table 2.1. Annual and quarterly estimates of wages and salaries are available by aggregate industry groupings in NIPA table 2.2. Monthly estimates of wages and salaries for total private industries and for total government and monthly estimates of total supplements are available in NIPA table 2.6. Monthly estimates of wages and salaries by aggregate industry groupings are available in table 2.7. BEA also prepares state and local area estimates of compensation and its components by industry and by type. For more information, see the "Regional" page at www.bea.gov.

[12] The NIPAs also present estimates of the benefits paid by government social insurance programs in table 3.12.

that are not seasonally adjusted; these are available in Section 8 of the NIPA Interactive Data Tables.

Additional information on compensation is available in "Underlying Detail tables."[13] Compensation paid to general government employees—that is, both civilian and military employees of federal and state and local agencies excluding government enterprises—is available in several tables, but table 3.25U provides detail not found elsewhere. And while annual estimates of employer contributions for government social insurance are available in table 3.6, quarterly estimates are available as underlying detail in table 3.6U.

In addition, BEA prepares by-industry estimates of full- and part-time employees, full-time equivalent (FTE) employees, wages and salaries per FTE, hours worked by FTE, self-employed persons, and persons engaged in production (see NIPA tables 6.5-6.9). For a discussion of the derivation of the employment estimates, see appendix A to this chapter.

Other measures of compensation—or more specifically, measures of wages and employment—are prepared by the Census Bureau's County Business Patterns series and by BLS' Quarterly Census of Employment and Wages (QCEW) program.[14] The Census Bureau's estimates are derived from Federal administrative records and survey information from business establishments. BEA's statistics and BLS' statistics on compensation are both based primarily on BLS tabulations of employment and wage data from the unemployment insurance program; BEA presents the relationship between them annually in "Table 7.18. Relation of Wages and Salaries in the National Income and Product Accounts to Wages and Salaries as Published by the Bureau of Labor Statistics." A reproduction of table 7.18 appears below in the section "Adjustments to the QCEW data."

Overview of Source Data and Estimating Methods

As described earlier in the handbook, the NIPA estimates, including those for compensation of employees, are prepared using a wide variety of source data (see "Chapter 3: Principal Source Data") and using estimating methods that adjust the source data to the required NIPA concepts and that fill in gaps in coverage and timing (see "Chapter 4: Estimating Methods"). Specifically, the compensation estimates are based on statistical reports from federal agencies including BLS and the Department of the Treasury, on federal budget publications and

[13] BEA does not include these detailed estimates in the published tables because their quality is significantly less than that of the higher level aggregates in which they are included. Compared with these aggregates, the more detailed estimates are more likely to be based on judgmental trends, on trends in higher level aggregates, or on less reliable source data.

[14] See "What is the difference between BEA employment and wages and BLS and Census employment and wages?" on BEA's website at www.bea.gov; select "Help" and then "FAQs."

other administrative and regulatory agency reports, and on reports from private organizations (such as trade associations).

Tables 10.A (wages and salaries), 10.B (employer contributions for pension and insurance funds), and 10.C (employer contributions for government social insurance) at the end of this chapter summarize the source data and estimating methods that are used to prepare the annual estimates and the current quarterly estimates of compensation and its components. The tables follow the categories shown in NIPA tables 6.3 (for wages and salaries), 6.11 (for employer contributions for pension and insurance funds), and 3.6 (for employer contributions for government social insurance).[15] The source data and methods for the current quarterly estimates reflect both seasonally adjusted and not seasonally adjusted estimates unless otherwise noted.

Annual estimates

"Compensation of employees, paid" is measured as the sum of wages and salaries and of supplements to wages and salaries. The primary source of information on annual wages and salaries is the QCEW; the sources of information on supplements to wages and salaries are as varied as the programs themselves.

Wages and salaries. The benchmark and annual estimates are derived using the same source data and methodologies. For private industry employees and for civilian employees of federal government, of state and local general government, and of the U. S. Postal Service, the estimates are primarily based on the QCEW. Estimates for the military and for other government enterprises are discussed below in the section "Adjustments to the QCEW data." QCEW data on wages and salaries are generally available for all four quarters of the previous year at the time of the annual update of the NIPAs, which typically occurs in July.

The QCEW is a federal-state cooperative program in which state employment agencies compile and report to BLS the monthly data on employment and the quarterly data on total and taxable wages that are reported to the states each quarter by private industries on quarterly tax

[15] In NIPA table 6.3, total wages and salaries on a national income basis—which includes wages and salaries received from the rest of the world and excludes wages and salaries paid to the rest of the world—is shown on line 1. The industry-specific estimates, beginning with "Domestic industries" on line 2, include payments to the rest of the world (and exclude receipts from the rest of the world) in order to accurately reflect each industry's total wage and salary liability. The offsetting entry, total wages and salaries paid to the rest of the world netted against wages and salaries received from the rest of the world, is shown on line 97.

In NIPA table 3.6, the entry "Rest-of-the-world contributions" on line 32 recognizes the employer and employee contributions for government social insurance from residents of the U.S. territories of Guam, American Samoa, and the U.S. Virgin Islands and of the U.S. commonwealths of Puerto Rico and the Northern Mariana Islands. In the NIPAs, these are treated as contributions from "nonresidents" (see the section "Geographic coverage" in chapter 2 of this handbook) and as a consequence, they are not included in the NIPA estimates of total supplements to wages and salaries and are not shown in table 10.C.

returns and by federal agencies and state and local governments on similar reports for employees covered by state unemployment insurance (UI) laws or by the Unemployment Compensation for Federal Employees (UCFE) program. These data cover about 97 percent of employees on nonfarm payrolls. BLS tabulates the data by geographical categories (county, metropolitan statistical area, combined statistical area, state, and the nation), by six-digit NAICS industry level, and by ownership sectors (private industry, federal government, state government, or local government).

The composition of wages reported to state employment agencies is generally consistent with the NIPA definition of wages and salaries. The data are on a disbursement basis; they reflect the total wages and salaries paid during a calendar quarter, regardless of when the services were performed (although a few state laws specify that wages be reported on an accrual basis). Conversely, the NIPAs record compensation and its components on an accrual basis; they reflect the total wages and salaries earned during the period, regardless of when they were paid. In most years, the pattern of wage and salary accruals and disbursements is relatively stable, with no difference between the measures of accruals and disbursements.[16] However, when there is evidence of a substantial departure from the usual pattern, BEA may incorporate a timing adjustment to better reflect the earnings accrued in each period. When these adjustments are made, they are recorded in the annual wage reconciliation table (NIPA table 7.18) discussed below in the section "Adjustments to the QCEW data." [17]

BEA sums the quarterly QCEW data for each industry to derive annual estimates and makes additional adjustments to account for misreporting of wages on employment tax returns and for differences in coverage and in definitions (see the section "Adjustments to the QCEW data"); these adjustments account for about 5 percent of the NIPA estimate of wages and salaries. BEA uses industry payroll data from the Census Bureau's Economic Census to aggregate the estimates across industries and levels of government to prepare estimates of total wages and salaries by legal form and sector.

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[16] As a simple example, if wages and salaries accrued annually include bonuses that typically equal $100, with one-half of the bonuses paid in the current year and one-half paid in the following year, then each year's disbursed wages will include a $50 bonus payment accrued in the current year and a $50 bonus payment accrued in the previous year; the total bonuses paid in each year—$100—equals the bonuses accrued.

[17] Prior to the 2013 comprehensive update of the NIPAs, the NIPAs presented a third compensation measure, "compensation of employees, received" that reflected estimates of wages and salaries on a disbursement basis. An entry for "wage and salary accruals less disbursements" (WALD) in the national income tables reconciled the two accrual-based measures with this disbursement-based measure. In practice, there was often little information on the timing differences between accruals and disbursements, and the measure of WALD was typically zero. The new treatment, introduced during the 2013 comprehensive update of the NIPAs, discontinued the disbursement-based measure of "compensation of employees, received" and the measures of WALD in order to better align transactions of the personal income and outlays account with those of the private enterprise income account, to simplify the presentation of wages and salaries within the accounts, and to help bring the NIPAs in line with recommendations of the SNA. See "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts: Changes in Definitions and Presentations," *Survey* 93 (March 2013): 13-39.

Supplements to wages and salaries. The benchmark and annual estimates are derived using the same source data and methodologies. Employer contributions for employee pension and insurance funds consists of the contributions made by private or government employers to privately administered retirement and insurance programs and by government employers to government employee pension plans and to publicly administered government employee insurance programs. Employer contributions for government social insurance consists of the contributions made by private and public employers to other publicly administered programs that provide certain social benefits, such as social security and Medicare.[18]

For employer contributions for pension funds, supplements are estimated by type of fund—defined contribution and defined benefit pension plans—and by employer—private plans and government employee plans. For defined contributions plans, future benefits are determined by the contributions made by employers and employees into the plan and by the income earned on the financial assets that the plans hold; therefore, actual contributions reflect the accrual accounting method. For defined benefit plans, future benefit entitlements are determined independently of actual contributions and may differ from them.[19] Thus, in order to reflect the accrual accounting basis, the NIPA measures of employer contributions to defined benefit plans reflect actual contributions and—when actual contributions differ from the entitlements earned in the period—imputed contributions to reflect the value of the employers' liability for entitlements and for the administrative expenses of the plan that are not fulfilled by actual contributions.[20] The measurement of employer contributions for both types of plans are described below and in table 10.B.[21]

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[18] For descriptions of the government social insurance programs included in the NIPA measure of employer contributions for government social insurance, see U.S. Bureau of Economic Analysis, *MP-5: Government Transactions* (Methodology Papers: U.S. National Income and Product Accounts, September 2005).

[19] This is especially true in cases where the actual contributions made by employers are sporadic. For example, employers sometimes skip contributions when the plans have enjoyed unusually good investment returns; conversely, employers sometimes make large "catch up" contributions to pay down unfunded benefit obligations.

[20] In periods where actual contributions exceed the total liability of employers, imputed employer contributions will be negative.

[21] The measurement of defined benefit pension plans on an accrual basis was introduced as part of the 2013 comprehensive update of the NIPAs to better align pension-related compensation with the timing of when employees earned the benefit entitlements and to be consistent with the recommendations of the 2008 SNA. The accrual-based estimates also avoid the volatility that arises when sporadic cash payments made by employers into defined benefit pension plans are used to measure compensation. For detailed information on accrual-based measures of benefit entitlements and contributions, see "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts: Changes in Definitions and Presentations," *Survey* 93 (March 2013): 13-39 and Marshall B. Reinsdorf and David G. Lenze, "Defined Benefit Pensions and Household Income and Wealth," *Survey* 89 (August 2009): 50-62. With the 2014 annual update of the NIPAs, defined contribution pension plans were also treated as part of the same subsector. With the 2018 comprehensive update, the valuation of state and local defined benefit pensions was changed from an accumulated benefit obligation basis to a projected benefit obligation basis.

For employer contributions to defined contribution pension plans, the estimates are primarily based on survey and administrative data from government agencies—including the Department of Labor, the Department of the Treasury, the Census Bureau, the Office of Personnel Management (OPM), the Federal Retirement Thrift Investment Board, the Pension Benefit Guaranty Corporation (PBGC), the Employment Benefits and Security Administration (EBSA), and the Department of Health and Human Services (HHS). For employer contributions to defined benefit pension plans, the NIPA estimates are based on actuarial estimates of the present value of claims to benefits accrued through service in the current period—commonly called normal costs—primarily from PBGC, EBSA, OPM, the Department of Treasury, the Department of Defense, and reports from state and local pension plans. The employers' portion of the liability for these claims—referred to as employers' normal costs—reflects actual and imputed employer contributions.

For privately sponsored defined benefit plans, estimates of employers' normal costs are based on actuarial estimates of employers' normal costs provided by the PBGC from data collected on IRS form 5500. The PBGC adjusts the estimates to include administrative expenses, and BEA adjusts the PBGC estimates to reflect a common discount rate based on the average AAA corporate bond rate published by Moody's Investors Service.

For federal government civilian employee defined benefit pension plans, estimates of employers' normal costs are based on OPM data published in the annual actuarial reports of the major civilian retirement plans, supplemented by data from the Department of Treasury. The estimates of employers' normal costs are scaled up slightly to account for smaller retirement plans such as those for employees of the Foreign Service and the Coast Guard that are not included in the source data. For the military defined benefit plans, estimates of employers' normal costs are based on Department of Defense data on normal cost rates and payroll.

For state and local employee defined benefit pension plans, the estimates of employers' normal costs are based on the service costs and employee contribution data reported in state and local government financial reports. BEA adjusts the estimates to reflect the same discount rate that is used for measures of privately sponsored defined benefit plans. Separate measures of administrative expenses are based on Census Bureau data.

For private insurance funds and publicly administered government employee insurance plans, estimates of employer contributions are primarily based on administrative and survey data from HHS, OPM, the Department of Veterans' Affairs, and A.M. Best's *Aggregates and Averages*.

For employer contributions for government social insurance, estimates are derived by program. They are primarily based on administrative data from the Social Security

Administration, the Department of Labor, and the Veterans' Administration; on survey data from the Census Bureau; and on financial data from the *Budget of the United States Government* (*Budget*) as published by the Office of Management and Budget.

The industry-specific estimates are prepared by allocating the estimates to three-digit NAICS industries using industry-specific information from the source data or from other industry-specific data that is related to the program or fund. For instance, the source data underlying the estimates of workers' compensation do not include industry information, so industry ratios are derived from industry-specific data on occupational injuries and illnesses from BLS.

Current quarterly estimates

Current quarterly estimates of wages and salaries and of supplements to wages and salaries are published only at aggregate levels and not by detailed industries or by program. For wages and salaries, seasonally adjusted current quarterly estimates are prepared by averaging the monthly estimates of wages and salaries that are released as part of BEA's monthly personal income estimates. For the published aggregates of supplements to wages and salaries—that is, employer contributions for employee pension and insurance funds and employer contributions for government social insurance—seasonally adjusted current quarterly estimates are derived as the sum of the components (or some aggregate level of the components) that are, in most cases, prepared by extrapolation, either judgmentally or by using an indicator series (for an explanation of this method, see "Interpolation and extrapolation using an indicator series" in chapter 4).[22]

Wages and salaries. As noted above, the primary source for the annual estimates of private wages and salaries is QCEW data. Because these quarterly data are generally available 5 months after the end of a quarter, the estimates of private wages and salaries for the quarters for which the QCEW data are not yet available are derived by averaging the current monthly estimates.[23] The current monthly estimates are extrapolated for each industry from the historical monthly estimates, which are in turn based on the most recent quarterly QCEW data that are available; the industry estimates are then summed to derive the monthly estimates for total wages and salaries. The extrapolation is based on the most recent monthly data from the BLS current employment statistics (CES) program and is calculated as the growth rate for employment times average weekly hours times and average hourly earnings. Similarly, once the QCEW data are

[22] Most of the source data that are used for extrapolation are seasonally adjusted; when this is not the case, BEA seasonally adjusts data that display seasonality (see the section "Seasonal adjustment" in chapter 2 of this handbook). In cases where estimates are extrapolated without the use of indicator series, there is no monthly or quarterly seasonality.

[23] The monthly estimates of personal income, including compensation, are expressed at annual rates; consequently, the current quarterly estimates, also expressed at annual rates, may be derived by averaging the monthly estimates.

incorporated into the quarterly estimates, the monthly estimates are interpolated based on the same CES indicator series. For example, the end-of-November release of Personal Income and Outlays for October contains monthly estimates of wages and salaries for July through October that are CES extrapolations of revised monthly estimates for the second quarter that are based on newly available QCEW data. In turn, the end-of-November release of GDP for the third quarter (second estimate) contains third-quarter estimates of wages and salaries that are derived by averaging the monthly Personal Income and Outlay estimates.

In general, the release of the "third" current quarterly estimate of GDP marks the last opportunity to revise most NIPA estimates until the next annual update. However, because of the importance of the QCEW as a data source and because of the 5-month lag in its availability, an exception is made for private wages and salaries and for private employer contributions for government social insurance (for which the estimates are generally based on estimates of private wages and salaries). As part of the "second" current quarterly release of GDP, the *preceding* quarter's estimates for these series and for affected income-side aggregates are revised in order to incorporate the newly available QCEW data.[24] Thus, continuing with the example above, the end-of-November release of GDP for the third quarter (second estimate) *also* contains revised estimates of wages and salaries for the *second* quarter that are based on newly available QCEW data. The months of the second quarter are interpolated based on the QCEW-derived quarterly control.

For federal and for state and local government employees, the current quarterly estimates are derived by summing monthly extrapolations from the most recent annual estimates. Federal civilian estimates for both general government and government enterprises are extrapolated using an indicator series that is based primarily on CES employment data. Federal military estimates are extrapolated using Department of Defense employment data. State and local government estimates for both general government and government enterprises are extrapolated using an indicator series that is based on CES employment data and on information on the change in the cost of labor from the BLS employment cost index.

Supplements to wages and salaries. Current quarterly estimates of employer contributions for employee pension and insurance funds are released only for the aggregate, which is prepared as the sum of the components or aggregate levels of the components. In most cases, the component

[24] This procedure was introduced as part of the 2002 annual update in order to reduce the magnitude of revisions to the estimates of wages and salaries. (See the box "Revisions to Wages and Salaries and to Profits" in Eugene P. Seskin and Stephanie H. McCulla, "Annual Revision of the National Income and Product Accounts," *Survey* 82 (August 2002): 24-25.) Affected aggregates include gross domestic income, the statistical discrepancy, gross national income, national income, personal income, disposable personal income, personal taxes, personal saving, gross (national) saving, compensation, and gross product of corporate business. Other components that are closely linked to wages and salaries, such as personal current taxes and employer contributions for government social insurance, are also revised. Product-side series, including government compensation, which is a component of GDP, are not revised.

estimates are prepared by judgmentally projecting annual estimates into the next year and then interpolating those projected annual estimates into quarterly (and monthly) estimates.

Current quarterly estimates of employer contributions for government social insurance funds are also prepared as the sum of its components. These components are generally extrapolated from the annual estimates to quarterly (and monthly) estimates using indicator series, so they are made available as part of the NIPA underlying detail (see the section "Recording in the NIPAs"). In most cases, the indicator series are based on NIPA wage and salary estimates or the component estimates are extrapolated without an indicator but with information from *Budget* projections of relevant outlays. As mentioned earlier, the estimates of employer contributions for government social insurance funds for the preceding quarter are revised to incorporate newly available QCEW data as part of the "second" current quarterly release of GDP.

The not seasonally adjusted (NSA) estimates of compensation of employees are derived using the same methods as the seasonally adjusted estimates, using not seasonally adjusted versions of the same indicators.

Adjustments to the QCEW data

The QCEW data on wages and salaries are largely consistent with the concepts and definitions underlying the NIPA estimates of wages and salaries. However, in deriving the annual estimates of wages and salaries for the NIPAs, BEA adjusts the QCEW data to account for misreporting of wages (including tips) on employment tax returns and for differences in coverage and in definitions. A reconciliation of the BLS and the NIPA estimates of wages and salaries is presented annually in NIPA table 7.18, a reproduction of which is shown for a single year in table 10.2 below.

Table 10.2: Relation of BLS Wages and Salaries and NIPA Wages and Salaries
(Billions of dollars)

Line in NIPA table 7.18	NIPA line item	2017
1	Total wages and salaries, BLS[1] Plus:	7,966.3
2	Adjustment for misreporting on employment tax returns[2]	94.1
3	Adjustment for wages and salaries not covered or not fully covered by unemployment insurance	393.4
4	Government	151.4
5	Other	242.0
6	Timing adjustment for accrual basis	0.0
7	Equals: Wages and salaries, NIPAs	8,453.8

[1] Total annual wages of workers covered by state unemployment insurance (UI) laws and by the Unemployment Compensation for Federal Employees program. Data for the most recent year are preliminary.
[2] Consists of unreported wages and salaries paid by employers and of unreported tips.

Adjustment for misreporting on employment tax returns (line 2). Adjustments are made to the QCEW data to account for wages and salaries that are underreported on employment tax returns, for tips that are underreported, and for wages and salaries that are not reported at all because the employers fail to file an employment tax return.

- The estimates of underreported income are based on audits of individual employment tax returns undertaken as part of the IRS National Research Program (NRP) for the 2008-2010 span.[25]
- The adjustment for underreported tips or gratuities is derived in the preparation of BEA's input-output accounts for industries—primarily accommodations, food services, taxis, barber shops, and beauty salons—where tips are a significant factor in compensation. The adjustment is based on the assumption that not all tips are included in the wages and salaries reported on the employment tax returns, and it is derived using information on industry sales and information on "tip rates" from the IRS.
- The estimates of nonreported income are based on "exact-match" studies that the Census Bureau provides to BEA. These studies match records from the Current Population Survey (CPS), conducted by the Census Bureau for BLS, with individual IRS tax returns in order to estimate nonfiler income for individuals.

[25] The IRS Taxpayer Compliance Measurement Program had provided estimates of misreported income for selected years since 1963. In 2001, the IRS launched the NRP to update the research and to reflect a changing economy, revisions to the tax code, and shifts in individual behavior.

Adjustment for wages and salaries not covered or not fully covered by unemployment insurance (line 3). The QCEW data provide almost complete coverage for most private industry employees, federal civilian employees, and state and local government employees. However, for military personnel and for certain private industries for which the QCEW provides little or no coverage—railroads, farms, farm labor contractors, private elementary and secondary schools, religious membership organizations, and private households—estimates of wages and salaries are prepared separately using other source data.

- Government (line 4). This entry reflects the addition of the NIPA estimate for wages and salaries of military personnel and for various other government wage and salary payments not captured by the QCEW. The compensation paid to military personnel is based on *Budget* data and includes cash wages as well as in-kind compensation such as uniform and housing allowances and rations. The wage and salary information in the *Budget* is available on a fiscal year basis; actual wage and salary expenses are provided for one year, and projections are provided for the current year and the budget year (for example, the FY2015 *Budget* provides actual expenses for FY2013 and projected expenses for FY2014 and FY2015). BEA converts the fiscal year estimates to a calendar year basis by allocating one quarter of the estimate for a given fiscal year to the previous year and three quarters to the given year.

  Additional government-related adjustments are made for students and their spouses employed by public colleges or universities, for elected officials and members of the judiciary, for intelligence agents, for interns employed by publicly administered hospitals and by social service agencies, for judicial fees paid to jurors and witnesses, for compensation of prison inmates, and for marriage and license fees paid to justices of the peace. These adjustments, which comprise only a very small share of the total government adjustment, are prepared using a variety of source data, including data from the Census Bureau and the Department of Justice.

- Other (line 5). This entry accounts for all of the other adjustments that are made in the estimation of NIPA wages and salaries, including estimates for employees not covered by the QCEW and estimates for differences between the QCEW and the NIPA definitions of wages and salaries.

  Adjustments for employees not fully captured in the QCEW data are made as follows:

  - *for federal government enterprises* excluding the U.S. Postal Service (which is covered by the QCEW), based on *Budget* data.
  - *for farms*, based on data on farm labor expenses from the U.S. Department of

Agriculture (USDA).
- *for farm labor contractors*, primarily based on data for contract farm labor expenses from the Census of Agriculture.
- *for private elementary and secondary schools*, primarily based on annual payroll data from the Census Bureau's *County Business Patterns*; estimates of in-kind wages are judgmentally derived.
- *for religious membership organizations*, primarily based on annual payroll data from the Census Bureau's *County Business Patterns*; estimates of in-kind wages are judgmentally derived.
- *for private households*, primarily based on CPS data; estimates of in-kind wages are judgmentally derived.
- *for railroads*, primarily based on wage and salary data from the Railroad Retirement Board.

Adjustments for differences between the QCEW and the NIPA definitions of wages and salaries include the following:

- An adjustment to include compensation received from foreign employers and to exclude compensation paid to foreigners in order to make the measure consistent with national income, derived from ITA estimates of compensation received from foreigners. Alternatively, in gross domestic income tables, the ITA estimate of compensation paid to the rest of the world is included and the ITA estimate of compensation received from the rest of the world is excluded. The ITA estimates of compensation received from, and paid to, foreigners are based mostly on data from foreign statistical authorities and from the IRS, as well as various demographic and labor market data from the USDA and the Department of Labor.[26]
- An adjustment to include employer contributions to "cafeteria plans" that are excluded from the QCEW data for private industries and for state and local governments when state laws do not count them as wages for unemployment insurance purposes. These plans allow participating employees to use a portion of their salaries on a pre-tax basis to pay for health insurance and for "flexible spending accounts," which reimburse employees for medical care and for dependent daycare. The adjustment is based on data from the Agency for Healthcare Research and Quality's Medical Expenditure Panel Survey and on trade source data.[27] This adjustment is not needed for federal employer

[26] For more information on the sources and methods for estimating compensation paid to and received from the rest of the world, see the section "Compensation of Employees" in "U.S. International Transactions Accounts: Concepts and Estimation Methods," at www.bea.gov.
[27] For more information, see Clinton P. McCully and Steven Payson, "Preview of the 2009 Comprehensive Revision of the NIPAs," *Survey* 89 (May 2009): 11.

contributions to these plans because they are included in the QCEW data for all states.

- Adjustment for timing for accrual basis (line 6). This adjustment accounts for differences in the timing of wage and salary disbursements from QCEW data and the accrual basis underlying the NIPA measure of wages and salaries. A positive adjustment reflects a net amount of compensation that was earned, but not actually received (and therefore not reflected in the source data) during the period, and a negative adjustment reflects a net amount of compensation that was paid (and reflected in the source data), but not actually earned, during the period. In practice, as reliable source data are generally lacking on these differences, timing adjustments are infrequent.

Table 10.A—Summary of Methodology Used to Prepare Estimates of Wages and Salaries

Line in NIPA table 6.3	Component	Annual estimates	Current quarterly estimates (Indicator series used to extrapolate)
3	Private industries	Most industries: QCEW, with adjustments by BEA for coverage, misreporting, and definitions (see the section "Adjustments to the QCEW data"). For certain other industries, or types of enterprises within industries, other sources as follows: Farms: USDA farm labor expense data on cash wages and payments-in-kind by owner-operators to hired farm labor. Farm labor contractors: For Arizona and California, QCEW. For other states, for benchmark years, Census of Agriculture contract farm labor expenses, and for nonbenchmark years, straight-line interpolations of benchmark-year estimates. Private elementary and secondary schools: For cash wages, Census Bureau *County Business Patterns* data on annual payrolls; for pay-in-kind, judgmentally derived. Religious membership organizations: For cash wages, Census Bureau *County Business Patterns* data on annual payrolls. For in-kind wages, judgmentally derived. Private households: For cash wages, BLS *Current Population Survey* data. For pay-in-kind, judgmentally derived. Railroads: U.S. Railroad Retirement Board data on wages and salaries subject to the payroll tax that supports the railroad retirement system, adjusted to include the portion of wages and salaries not subject to the tax, based on the number of employees whose wages and salaries exceed the limit for retirement taxation. NSA: For historical quarters subject to revision, NSA estimates are interpolated from the annual control value using NSA QCEW by industry as the indicator.	CES employment, hours, and earnings data. NSA: For quarters in which NSA QCEW data are available, NSA estimates are extrapolated from the most recent estimates not subject to revision using the quarter-to-quarter change in NSA QCEW. For quarters where NSA QCEW data are unavailable, NSA estimates are derived by industry as a five-year moving average of the implied seasonal factor multiplied by the CES-based seasonally adjusted series.
86	Government:		
87	Federal government:		
89	Civilian general government	For cash wages, QCEW with adjustments by BEA for coverage (see the section "Adjustments to the QCEW data"). For in-kind transit benefits, Department of Transportation.	CES civilian employment data.
90	Military	For cash and in-kind wages, *Budget of the United States Government.*	Department of Defense manpower reports.
91	Government enterprises	For U.S. Postal Service, QCEW data. For other enterprises, *Budget* data.	CES employment data for Postal Service.
92	State and local government:		
93	General	QCEW data for all state and local employees allocated to general government	CES employment data and BLS employment

Table 10.A—Summary of Methodology Used to Prepare Estimates of Wages and Salaries

Line in NIPA table 6.3	Component	Annual estimates	Current quarterly estimates (Indicator series used to extrapolate)
	government	and government enterprises using Census Bureau *Public Employment* payroll data with adjustments by BEA for coverage (see the section "Adjustments to the QCEW data").	cost index data.
96	Government enterprises	QCEW data for employees allocated to government enterprises using Census Bureau *Public Employment* payroll data.	CES employment data and BLS employment cost index data.
97	Rest of the world:		
98	Receipts from the rest of the world	ITA estimates.	ITA estimates.
99	Less: Payments to the rest of the world	ITA estimates.	ITA estimates.

BEA Bureau of Economic Analysis
BLS Bureau of Labor Statistics
CES Current Employment Statistics, BLS
ITA International Transactions Accounts, BEA
QCEW Quarterly Census of Employment and Wages, BLS

Table 10.B—Summary of Methodology Used to Prepare Estimates of Employer Contributions for Employee Pension and Insurance Funds			
Line in NIPA table 6.11	Component	Annual estimates	Current quarterly estimates* (Indicator series used to extrapolate)
22	Employer contributions for employee pension and insurance funds	See method for each component.	The aggregate of unreleased measures of (1) private employer contributions for employee pension and insurance funds, (2) federal government employer contributions for employee pension and insurance funds, and (3) state and local government employer contributions for employee pension and insurance funds. (1) For the aggregate of private employer contributions for private pension and insurance funds, judgmental trend. (2) For the aggregate of federal employer contributions for employee pension and insurance funds, the sum of unreleased measures of (1) federal government employer contributions to government employee pension plans, (2) federal government employer contributions to group health insurance, (3) federal government employer contributions to group life insurance, and (4) federal government employer contributions to publicly administered government employee insurance plans. See corresponding entries below. (3) For the aggregate of state and local employer contributions to employee pension and insurance funds, the sum of unreleased measures of (1) state and local government employer contributions to government employee pension plans, (2) state and local government employer contributions to group health insurance, (3) state and local government employer contributions to group life insurance, and (4) state and local government employer contributions to workers' compensation. NSA: Seasonally adjusted and NSA measures of employer contributions for employee pension and insurance funds are presumed equal.

Table 10.B—Summary of Methodology Used to Prepare Estimates of Employer Contributions for Employee Pension and Insurance Funds			
Line in NIPA table 6.11	Component	Annual estimates	Current quarterly estimates* (Indicator series used to extrapolate)
23	Pension plans		
24	Private pension plans		
25	Defined benefit	For all except 2 most recent years, employers' normal costs based on BEA tabulations of plan-level data provided by PBGC from IRS form 5500 on employer normal costs for each plan, adjusted to a uniform discount rate based on AAA corporate bond rates from Moody's Investors Service and aggregated to the total for all industries. [28] For second most recent year, employers' normal costs based on BEA tabulations of form 5500 data provided by PBGC with adjustments by BEA for coverage. For most recent year, employers' normal costs derived as BEA's normal cost rate applied to total covered payroll; form 5500 data are not available for the most recent year. Covered payroll is derived as the product of NIPA wages and salaries and a coverage rate, which is derived as the ratio of the number of active participants, from EBSA data, to private full-time equivalent employees, from NIPA estimates.	Quarterly estimates are not released at this level of detail; see line 22.
26	Defined contribution	For all except 2 most recent years, employers' cash contributions from EBSA tabulations of IRS form 5500 data for three-digit NAICS industries. For second most recent year, PBGC tabulations of IRS form 5500 data, and for most recent year, Standard and Poor's 500 and other corporate financial data.	Quarterly estimates are not released at this level of detail; see line 22.
27	Government employee pension plans	See method for each component,	Quarterly estimates are not released at this level of detail; see line 22. For unreleased measures of government employee pension plans, the sum of unreleased measures of federal government employee pension plans and state

[28] Plan-level data are assigned to a 6-digit NAICS code based on the primary industry of the employer.

Table 10.B—Summary of Methodology Used to Prepare Estimates of Employer Contributions for Employee Pension and Insurance Funds			
Line in NIPA table 6.11	Component	Annual estimates	Current quarterly estimates* (Indicator series used to extrapolate)
			and local employee pension plans; see lines 28 and 29.
28	Federal	Civilian: For defined contribution plans, such as Thrift Savings Plan, actual contributions based on Federal Retirement Thrift Investment Board data. For defined benefit plans, for all except most recent year, total employer contributions based on OPM estimates of employers' normal costs for the Federal Employees Retirement System (FERS), and normal cost rates and payroll data for the Civil Service Retirement System (CSRS), adjusted to alternative discount rates. Total employer contributions are scaled up by BEA to reflect smaller plans not included in OPM data. For the most recent year for both FERS and CSRS plans, total employer contributions based on OPM projections of normal cost rates and payroll data. Military: For defined contribution plans, contributions to the Thrift Savings Plan based on Federal Retirement Thrift Investment Board data and judgmental trends. For defined benefit plans, for all except the most recent year, total employer contributions derived from DoD reports on employer normal cost rates and payroll. For the most recent year, total employers' normal costs derived from DoD Office of the Actuary projections of normal cost rates and payroll.	Quarterly estimates are not released at this level of detail. See line 22. For unreleased measures of federal government employer contributions to government employee pension plans, the sum of components: Civilian: For defined contribution plans, CES employment. For defined benefit plans, interpolation without indicator of annual estimates extrapolated based on OPM projections of normal cost rates and payroll data. Military: For defined contribution plans, contributions to the Thrift Savings Plan based on Federal Retirement Thrift Investment Board data and judgmental trends. For contributions for defined benefit plans, interpolation without indicator of annual estimates extrapolated based on DoD projections of normal cost rates and payroll data.
29	State and local	For defined contributions plans, ratio of employer contributions as a percent of compensation to wages as a percent of compensation from BLS Employer Costs for Employee Compensation survey data applied to NIPA wages and salaries. For defined benefit plans for all except 2 most recent years, employers' normal cost based on financial and actuarial reports of a sample (covering 90 percent of universe) of S&L	Quarterly estimates are not released at this level of detail. See line 22. For unreleased measures of state and local employer contributions to employee pension plans, the sum of components: For defined contribution plans, same as annual.

Table 10.B—Summary of Methodology Used to Prepare Estimates of Employer Contributions for Employee Pension and Insurance Funds			
Line in NIPA table 6.11	Component	Annual estimates	Current quarterly estimates* (Indicator series used to extrapolate)
		retirement systems scaled up to represent the universe of systems and adjusted to reflect common actuarial cost method and discount rate, plus administrative expenses based on Census data. For second most recent year, employers' normal cost extrapolated using incomplete sample data and administrative data based on judgmental trend. For most recent year, judgmental trend.	For defined benefit plans, extrapolated using NIPA wages and salaries.
30	Private insurance funds		
31	Group insurance		
32	Group health insurance	For private employer contributions, Health and Human Services' Agency for Health Care Research and Quality's *Medical Expenditure Panel Survey* data on insurance purchased by employers for employees and on health insurance provided by employers who insure themselves (self-insurance). For state and local government contributions, for all except most recent year, same as for private employers. For most recent year, judgmental trend. For federal government contributions, OPM internal accounting report for the Federal Employee Health Benefits Program.	Quarterly estimates are not released at this level of detail. See line 22. For unreleased aggregate of private employer contributions for private pension and insurance funds, judgmental trend. For unreleased measures of state and local government employer contributions to group health insurance, judgmental trend. For unreleased measures of federal government employer contributions to group health insurance, CES employment data.
33	Group life insurance	For private and for state and local government, for all except the most recent year, A.M. Best's *Aggregate and Averages Life/Health* data on premiums paid. For most recent year, extrapolated based on the percent change in net premiums from A.M. Best data. For federal government contributions for civilian employees, OPM internal accounting report for the Federal Employee Group Life Insurance Program. For federal government contributions for active duty military personnel and their families, Veterans' Affairs Administration data on premiums paid for Servicemen's Group Life	Quarterly estimates are not released at this level of detail. See line 22. For unreleased aggregate of private employer contributions for private pension and insurance funds, judgmental trend. For unreleased measures of federal government employer contributions for group life insurance, CES employment data.

Table 10.B—Summary of Methodology Used to Prepare Estimates of Employer Contributions for Employee Pension and Insurance Funds			
Line in NIPA table 6.11	Component	Annual estimates	Current quarterly estimates* (Indicator series used to extrapolate)
		Insurance.	For unreleased measures of state and local government employer contributions to group life insurance, CES employment data.
34	Workers' compensation	A.M. Best's *Aggregates and Averages Property/Casualty* data on premiums paid, supplemented by data from the National Academy of Social Insurance (NASI) for self-insured and for large deductible policies, and by data on the contributions made to privatized funds that are not covered by A.M. Best or by NASI from the National Council on Compensation Insurance, the National Association of Insurance Commissioners, and the American Association of State Compensation Insurance Funds.	Quarterly estimates are not released at this level of detail. See line 22. For unreleased aggregate of private employer contributions for private pension and insurance funds, judgmental trend. For unreleased measures of state and local government employer contributions to workers' compensation, CES employment data.
35	Supplemental unemployment benefit funds	EBSA tabulations of IRS form 5500 data.	Quarterly estimates are not released at this level of detail. See line 22. For unreleased aggregate of private employer contributions for private pension and insurance funds, judgmental trend.
36	Publicly administered government employee insurance plans	*Monthly Treasury Statement* data on employer contributions to the "Medicare-Eligible Retiree Health Care Fund"	Quarterly estimates are not released at this level of detail. See line 22. For unreleased measures of military employment from DoD manpower reports.

*Quarterly estimates are provided only for the aggregate of employer contributions for pension and insurance funds.

BEA	Bureau of Economic Analysis	MTS	Monthly Treasury Statement
BLS	Bureau of Labor Statistics	NAICS	North American Industry Classification System
CES	Current Employment Statistics, BLS	NIPA	National Income and Product Accounts
DoD	Department of Defense	OPM	Office of Personnel Management
EBSA	Employment Benefits and Security Administration	PBGC	Pension Benefit Guaranty Corporation
IRS	Internal Revenue Service		

Table 10.C—Summary of Methodology Used to Prepare Estimates of Employer Contributions to Government Social Insurance			
Line in NIPA table 3.6	Component	Annual estimates	Current quarterly estimates* (Indicator series used to extrapolate)
5	Old-age, survivors, and disability insurance	SSA *Social Security Bulletin: Annual Statistical Supplement* data on wages and salaries subject to OASDI taxes multiplied by OASDI tax rate.	NIPA wages and salaries for appropriate industries.
6	Hospital insurance	For all employees except those in the railroad industry, SSA wages and salaries multiplied by the hospital-insurance tax rate. For railroad employees, U.S. Railroad Retirement Board calendar year data on railroad wages and salaries multiplied by the hospital insurance tax rate.	For workers covered by OASDI, same as for OASDI. For workers not covered by OASDI, judgmental trend.
8	State unemployment insurance	QCEW data on total unemployment insurance taxes.	For contributions by private employers, NIPA private wages and salaries less those of railroad, farm, and private household workers. For state and local reimbursements, unemployment insurance rate.
9	Federal unemployment tax	Sum of (1) Office of Workforce Security, Department of Labor tabulations of taxable wages and salaries by state from annual tax returns filed by employers multiplied by the effective federal tax rate and (2) for states that have borrowed funds to finance unemployment benefits, either the taxable wages and salaries multiplied by the surtax rate or state-provided data on the amount of surtax.	NIPA private wages and salaries less those of railroad, farm, and private household workers.
10	Railroad employees unemployment insurance	*Monthly Treasury Statement* data on railroad unemployment tax receipts.	NIPA railroad wages and salaries.
11	Federal employees unemployment insurance	Imputation based on Office of Workforce Security data on unemployment benefits paid to unemployed former federal employees.	Same as for annual estimates.
12	Railroad retirement	U.S. Railroad Retirement Board *Annual Report* data on wages and salaries subject to railroad retirement multiplied by railroad retirement tax rates.	NIPA railroad wages and salaries.
13	Pension benefit guaranty	Pension Benefit Guaranty Corporation monthly data on premiums paid by employers, aligned to the calendar years in which the premiums were accrued.	Extrapolated using information from fiscal year projections of premium collections from the *Budget of the United States Government*.
14	Veterans life	Veterans Affairs *Annual Report* data on premiums paid by the	Judgmental trend.

Table 10.C—Summary of Methodology Used to Prepare Estimates of Employer Contributions to Government Social Insurance			
Line in NIPA table 3.6	Component	Annual estimates	Current quarterly estimates* (Indicator series used to extrapolate)
	insurance	federal government to life insurance programs for veterans.	
15	Workers' compensation	Imputation equal to benefits paid based on unpublished data on benefits from the Department of Labor's Employment Standards Administration.	Extrapolated using information from fiscal year projections of premium collections from the *Budget*.
16	Military medical insurance	Imputation equal to benefits based on benefits data from the Department of Defense Military Health System's annual TRICARE report.	Extrapolated using information from fiscal year projections of premium collections from the *Budget.*
18	State and local temporary disability insurance	Required only by New Jersey and California. For New Jersey, estimated as a percentage of Census COG/GF data on total contributions for New Jersey. For California, estimated based on data on total employee contributions from California Employment Development Department.	Judgmental trend.
19	State and local workers' compensation	For state government contributions, COG/GF fiscal year data on state and local government contributions. For local government contributions, state government contributions multiplied by the ratio of local government full-time equivalent employees to state government full-time equivalent employees. For private employer contributions, COG/GF data on premiums.	CES employment data and judgmental extrapolation of premiums data.

*Quarterly estimates are provided as underlying detail only; these detailed estimates are not included in the published tables because their quality is significantly less than that of the higher level aggregates in which they are included. Compared with these aggregates, the more detailed estimates are more likely to be either based on judgmental trends, on trends in the higher level aggregate, or on less reliable source data.

BEA	Bureau of Economic Analysis
COG/GF	Census of Governments and Annual Surveys of Government Finances, Census Bureau
NIPA	National Income and Product Accounts
OASDI	Old-age, Survivors, and Disability Insurance
QCEW	Quarterly Census of Employment and Wages, Bureau of Labor Statistics
SSA	Social Security Administration

Appendix A: NIPA Measures of Employment and Hours

BLS is the principal provider of information on the labor market in the United States, including detailed data on employment, hours, and earnings. BEA prepares its own measures of employment and hours—based primarily on BLS data—to provide estimates that are consistent with the NIPA measures of compensation. That is, the NIPA measures of compensation and of employment and hours cover the same employees, they are adjusted consistently for misreporting, coverage, and definitions, and they are based primarily on the BLS Quarterly Census of Employment and Wages (QCEW) source data. Thus, the NIPA measures of employment and hours facilitate analyses of NIPA-based compensation and productivity by employee.

The QCEW program serves as a near census of quarterly employment information by 6-digit NAICS industry. The data reflect the number of workers covered by the Unemployment Insurance (UI) or the Unemployment Compensation for Federal Employees (UCFE) programs and are derived from quarterly reports filed by almost every employer in the U.S., Puerto Rico, and the U.S. Virgin Islands. All filled positions are included, whether full or part-time, temporary or permanent; as such it is likely that a multi-job holder will be counted two or more times in QCEW data. The estimates include foreign professional workers and undocumented migratory workers employed temporarily in the United States; these are classified as “Rest of world.”

The NIPA measures of employment by industry from 2001 forward are classified according to the North American Industry Classification System; prior to 2001, the measures are classified according to the Standard Industrial Classification system.

The NIPAs present current-dollar annual estimates of employment and hours by industry in the following tables.

6.4 Full-Time and Part-Time Employees by Industry

6.5 Full Time Equivalent Employees by Industry

6.6 Wages and Salaries per Full Time Equivalent Employee by Industry

6.7 Self-Employed Persons by Industry

6.8 Persons Engaged In Production by Industry

6.9 Hours Worked by Full-Time and Part-Time Employees by Industry

BEA presents the following annual employment estimates:

Full- and part-time employees by industry. This measure is derived as the annual sum of the QCEW tabulations of the monthly employment data reported to the states each quarter by private industries on quarterly tax returns for employees covered by UI laws and by federal agencies and state and local governments on similar reports for employees covered by the UCFE program. The measure is adjusted as described in the section on "Adjustments to the QCEW employment data."

Full-time equivalent employees by industry. This measure equals the number of employees on full-time schedules plus the number of employees on part-time schedules converted to a full-time basis. For the current year, the number of nonfederal full-time equivalent employees in each industry is the product of the total number of employees, from the QCEW, and the ratio of average weekly hours per employee for all employees to average weekly hours per employee on full-time schedules, based on data from the Current Population Survey (CPS) conducted by the Census Bureau for BLS. For previous years, the number of full-time equivalent employees in each industry is the product of the total number of employees and the ratio of full time employees to total employees, also from the CPS. An industry's full-time equivalent employment will be less than the number of its employees on full- and part-time schedules, unless it has no part-time employees. For federal employees and for the military, the number of full-time equivalent employees is based on data from the Budget of the United States Government.[29]

Wages and salaries per full-time equivalent employee by industry. This measure is derived as the NIPA wages and salaries by industry divided by the NIPA measure of full-time equivalent employees by industry.

Self-employed persons by industry. This measure consists of active proprietors or partners who devote a majority of their working hours to their unincorporated businesses. Unpaid family workers are not included. The measure is from BLS data on self-employment by industry and is not adjusted by BEA.

Persons engaged in production by industry. This measure equals the NIPA measure of full-time equivalent employees plus the number of self-employed persons in each industry.

Hours worked by full- and part-time employees by industry. For employees excluding the military, this measure is derived as the product of total full- and part-time employees and the number of average weekly hours per employee for all employees, multiplied by 52 weeks, based

[29] For federal civilian employees, the data are from the Historical Tables of the budget, available at https://www.whitehouse.gov/omb/historical-tables/.

on BLS data. For the military, this measure is derived as the product of the number of active duty military members and an assumed number of hours per year, plus the product of the number of reservists and an assumed number of hours per year.

Adjustments to the QCEW employment data

The QCEW employment data are largely consistent with the concepts and definitions underlying the NIPA estimates of employment and hours. However, as with the QCEW wage and salary data, BEA makes adjustments to make the data fully consistent with NIPA concepts, definitions, and coverage. First, BEA adjusts employment so that it remains consistent with the wages and salaries estimates adjusted for misreporting. Second, though the QCEW program provides partial information on agricultural industries and on employees in private households, BEA uses additional source data to estimate most or all of the employment for the same industries for which wages and salaries are adjusted: farms, farm labor contractors, private households, private elementary and secondary schools, religious membership organizations, railroads, military, and U.S. residents who are employed by international organizations and by foreign embassies and consulates in the United States.

Adjustment for misreporting. An adjustment is made to the QCEW data on private sector employment for consistency with the misreporting adjustments made to wages and salaries. That is, employment is adjusted in accordance with the adjustment to wages and salaries so that the proportional relationship between them remains the same.

Adjustment for employment that is not covered or not fully covered by UI and UCFE programs. An adjustment is made to add the employment of several industries that are not covered or that are not fully covered by the UI and UCFE programs. Following the entries in table 10.2, the adjustments are:

> Government.—Military employment is measured as the number of military personnel assigned to active duty units plus the number of military reserve unit members. The estimate is based on data from the Budget.
>
> Additional government-related adjustments are made for the employment of students and their spouses by public colleges or universities, for elected officials and members of the judiciary, for intelligence agents, and for interns employed by publicly administered hospitals and by social service agencies. These adjustments, which comprise only a very small share of the total government adjustment, are based on

corresponding adjustments underlying BEA's estimates of state personal income.[30]

Other.—Other adjustments include estimates for employees not fully covered by the QCEW, as follows:

- *for federal government enterprises* based on supplemental *Budget* data.
- *for farms,* based on quarterly data from USDA's National Agricultural Statistics Service on farm labor.
- *for farm labor contractors,* based on corresponding adjustments underlying BEA's state personal income estimates based on USDA data on expenditures for farm contract labor.
- *for railroads,* based on data from the Railroad Retirement Board.
- *for private elementary and secondary schools,* based on corresponding adjustments underlying BEA's state personal income estimates, which are in turn based on the employment reported annually by the Census Bureau's *County Business Patterns* (CBP).
- *for religious organizations,* based on CBP data.
- *for private households,* based on CPS data.

[30] For more information on BEA's estimates of state personal income, see "State Personal Income and Employment" at www.bea.gov.

CHAPTER 11: NONFARM PROPRIETORS' INCOME

(Updated: December 2020)

Definitions and Concepts
Recording in the NIPAs
Overview of Source Data and Estimating Methods
    Annual (except most-recent-year) estimates
    Most-recent-year estimates
    Current quarterly estimates
Table 11.A—Summary of Methodology for Nonfarm Proprietors' Income
Technical Note: Adjustments to IRS Source Data for Nonfarm Proprietors' Income

Nonfarm proprietors' income represents the portion of the total income earned from current production that is accounted for by unincorporated nonfarm businesses in the United States. The measure is an integral part of the national income and product accounts (NIPAs), a set of accounts prepared by the Bureau of Economic Analysis (BEA) that provides a logical and consistent framework for presenting statistics on U.S. economic activity (see "Chapter 2: Fundamental Concepts").

BEA's measure of nonfarm proprietors' income provides a comprehensive and consistent economic measure of the income earned by all U.S. unincorporated nonfarm businesses. The featured measure – nonfarm proprietors' income with inventory valuation adjustment and capital consumption adjustment is not directly affected by changes in tax laws, is adjusted for nonreported and misreported income, and excludes dividend income, capital gains and losses, and other financing flows and adjustments, such as deduction for "bad debt." Thus, the measure is a particularly useful analytical indicator of the health of noncorporate businesses and provides both a complement and contrast to the NIPA measure of corporate profits.

Nonfarm proprietors' income is a component of private enterprise income and personal income in the summary NIPA tables.

Definitions and Concepts

Nonfarm proprietors' income measures the income, before deducting income taxes, of sole proprietorships, partnerships, and other private nonfarm businesses that are organized for profit but that are not classified as corporations. Sole proprietorships are businesses owned by a

single individual. Partnerships include most associations of two or more of: individuals, corporations, noncorporate organizations that are organized for profit, or of other private businesses. Other private businesses are made up of tax-exempt cooperatives, including credit unions, mutual insurance companies, and rural utilities providing utility services and farm marketing and purchasing services.

The NIPA measures of national income and gross domestic income and their components present the incomes that accrue to factors of production as a result of their contribution to production. For corporations, these incomes are separately reported in detailed financial accounts and in tax returns, and they are reflected in the NIPA measures of corporate profits, compensation of employees, and net interest (as well as taxes). Unincorporated businesses, on the other hand, are able to move assets freely between business and personal accounts with little, if any, reporting requirements, and tax liabilities are not separated between unincorporated businesses and their owners. In fact, the income of unincorporated businesses is generally reported on individual income tax returns; while compensation paid to employees is separately reported, the income of the business is not distinguished from the labor of the business owner and therefore reflects the incomes that accrue as a result of the owner's own labor and entrepreneurship. Similarly, dividend and interest incomes are separately reported but do not distinguish between business and personal receipts. The measure of nonfarm proprietors' income is therefore a critical measure for analyses of the shares of income, as it reflects factor incomes that are not separately captured by the other income measures.

Reflecting the concepts of national economic accounting, nonfarm proprietors' income in the NIPAs is defined as that arising from current production. This income is measured as receipts less expenses as defined in federal tax law, but with several important differences. Table 11.1 shows the types of transactions that are included in, and excluded from, nonfarm proprietors' income.[1]

[1] The NIPA measures of proprietors' income are closely related to the measures for "mixed income" in the System of National Accounts (SNA). However, the SNA definition of mixed income is broader than proprietors' income and includes rental income of persons, noncorporate current transfer payments, and portions of net interest paid and consumption of fixed capital. At the same time, the SNA has a more narrow definition of the entities earning mixed income that excludes limited liability partnerships and any enterprises for which it is possible to separate all assets, including financial assets, into those that belong to the household and those that belong to the business. (See Stephanie H. McCulla, Karin E. Moses, and Brent R. Moulton, "The National Income and Product Accounts and the System of National Accounts 2008: Comparison and Research Plans," *Survey of Current Business* 95 (June 2015), and Charles Ian Mead, Karin E. Moses, and Brent R. Moulton, "The NIPAs and the System of National Accounts," *Survey of Current Business* 84 (December 2004): 17–32.)

Table 11.1—Content of Nonfarm Proprietors' Income

Category of transaction	Comments
Nonfarm proprietors' income	Includes all U.S. nonfarm sole proprietorships that are required to file Internal Revenue Service (IRS) Schedule C (Profits or Loss from Business) of IRS Form 1040 (Individual Income Tax Return) or that would be required if they met the filing requirements. Includes all U.S. nonfarm partnerships that are or would be required to file IRS Form 1065 (U.S. Partnership Return of Income). Includes all other U.S. unincorporated private businesses—tax-exempt cooperatives providing utility services and farm marketing and purchasing services. Receipts include taxable income from entities otherwise classified as nonprofits. Receipts exclude capital gains and dividends and monetary interest received by nonfinancial business. Receipts exclude rental income received by persons that are not primarily engaged in the real estate business. Expenses exclude deductions for bad debt, depletion, and capital losses. Expenses exclude expensing for, and include depreciation of, intellectual property products (including software) mining exploration, shafts, and wells, and rental clothing and videos.
Inventory valuation adjustment	Inventory withdrawals are valued at current cost.
Capital consumption adjustment	Depreciation is valued at current cost.

BEA uses data collected on a tax-accounting basis as the primary source of information for nonfarm proprietors' income. These data are based on well-specified, consistent accounting definitions that, in general, parallel NIPA concepts and definitions. In addition, tax-accounting tabulations are comprehensive, covering all unincorporated businesses. However, the data are not entirely suitable for implementing the NIPA concept of income from current production. Consequently, BEA's procedure for estimating nonfarm proprietors' income mainly consists of adjusting, incorporating, and supplementing these data.[2]

The featured measure of nonfarm proprietors' income includes two additional adjustments—the inventory valuation adjustment (IVA) and the capital consumption adjustment (CCAdj)—made to ensure that the measure reflects income from current production. The IVA reflects the fact that as prices change, businesses that value inventory withdrawals at original acquisition (historical) costs may realize inventory profits or losses. In the NIPAs, these gains or losses that result from holding goods in inventory are not considered income from current production and thus are removed from business income. The IVA converts the tax-accounting value of inventory withdrawals, which is based on a mixture of historical and current costs, to a

[2] See the section "Overview of Source Data and Estimating Procedures."

current-cost basis by removing the capital-gain-like or the capital-loss-like element that results from valuing these withdrawals at prices of earlier periods.[3]

Depreciation measured on a tax-accounting basis must be adjusted to reflect consistent economic-accounting measures that are valued at current-replacement cost. The CCAdj is a two-part adjustment that (1) converts valuations of depreciation that are based on a mixture of service lives and depreciation patterns specified in the tax code to valuations that are based on uniform service lives and empirically based depreciation patterns; and (2) like the IVA, converts the measures of depreciation to a current-cost basis by removing from profits the capital-gain-like or capital-loss-like element that arises from valuing the depreciation of fixed assets at the prices of earlier periods. A reconciliation of the Internal Revenue Service (IRS) measures of depreciation and BEA's measures of consumption of fixed capital for corporations and for proprietors are provided in NIPA "Table 7.13 Relation of Consumption of Fixed Capital in the National Income and Product Accounts to Depreciation and Amortization as Published by the Internal Revenue Service."[4]

The composition of proprietors' income with IVA and CCAdj is illustrated below.

	2015 estimate (billions of dollars)
Nonfarm proprietors' income with IVA and CCAdj	1,366.7
Nonfarm proprietors income without IVA and CCAdj	1130.8
IVA	9.4
CCAdj	226.5
For consistent accounting at historical cost	268.5
For current-cost valuation	-42.0

[3] For more information, see "Chapter 7: Change in Private Inventories," 7–4.

[4] Economic stimulus acts sometimes include temporary provisions for accelerated or "bonus" depreciation. Because total depreciation cannot exceed the amount of the investment, the amount of depreciation remaining to be taken in future years will be reduced. As depreciation will be increased during the "bonus" span and lowered thereafter, and because depreciation is an expense in calculating net income, NFPI will be understated during the "bonus" span and overstated thereafter.

BEA's featured measure of nonfarm proprietors' income–that is, NFPI with IVA and CCAdj—are not affected by bonus depreciation because the CCAdj replaces tax-based depreciation with economic depreciation—that is, consumption of fixed capital (CFC). BEA's estimates of bonus deprecation are published and are based on data from the Office of Tax Analysis (OTA) of the U.S. Department of Treasury and on other source data. For more information, see OTA's working paper "Corporate Response to Accelerated Tax Depreciation: Bonus Depreciation for Tax Years 2002–2004."

Recording in the NIPAs

As described in chapter 2, the NIPAs can be viewed as aggregations of accounts belonging to individual transactors in the economy. In the seven summary accounts of the NIPAs, proprietors' income, which includes both nonfarm and farm proprietors' income, with IVA and CCAdj appears in the Private Enterprise Account (account 2) and the Personal Income and Outlay Account (account 3). Taxes on proprietors' income are included in personal current taxes, which appears in the Personal Income and Outlay Account (account 3) and in the Government Receipts and Expenditures Account (account 4).

The NIPAs present current-dollar annual estimates of gross domestic income by type of income, national income by type of income, and national income by sector and legal form of organization. The sector-specific estimates follow the NIPA sectors—business (including government enterprises), households and institutions, general government, and the rest of the world; within the business sector, the estimates by legal form are classified according to the Internal Revenue Service (IRS) filing requirements for corporate and noncorporate business. Noncorporate business is made up of proprietors—that is, sole proprietorships, partnerships, and "other private business."[5] Annual estimates of nonfarm proprietors' income are also available by industry; the industry-specific estimates for 1998 forward are classified according to the North American Industry Classification System (NAICS) at the three-digit industry level, and the estimates prior to 1998 are classified according to the Standard Industrial Classification (SIC); the estimates for 1998-2000 are also available on an SIC basis.[6]

Estimates of nonfarm proprietors' income with inventory valuation and capital consumption adjustments and its aggregate components are also available quarterly.

The principal NIPA tables that present estimates of nonfarm proprietors' income as a component of GDI and of national income are identified below.[7]

1.10 Gross Domestic Income by Type of Income
1.11 Percentage Shares of Gross Domestic Income

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[5] For descriptions of NIPA sectors and of legal forms of organization, see the section "Classification" in chapter 2.
[6] Time-series breaks caused by the conversion to NAICS and by previous revisions to the SIC are reflected in the separation of estimates into distinct tables for each range of estimates based on a different classification. For instance, table 6.12, Nonfarm Proprietors' Income by Industry, comprises four separate tables: table 6.12A, based on the 1942 SIC; table 6.12B, based on the 1972 SIC; table 6.12C, based on the 1987 SIC; and table 6.12D, based on the 2012 NAICS. For more information on the conversion from the SIC to NAICS, see John R. Kort, "The North American Industry Classification System in BEA's Economic Accounts," *Survey* 81 (May 2001): 7–13.
[7] The NIPAs also present annual and quarterly estimates of proprietors' income with IVA and CCADj in NIPA table group 2 as part of personal income. Annual and quarterly estimates of "proprietors' income with IVA and CCAdj" and its major components are available in NIPA table 2.1, and monthly estimates of the same series are available in NIPA table 2.6. Annual estimates of proprietors' income with IVA and CCAdj are available for households in NIPA table 2.9. BEA also prepares state and local area estimates of nonfarm and farm proprietors' income. For more information, see the "Regional" page at www.bea.gov.

1.12 National Income by Type of Income
1.13 National Income by Sector, Legal Form of Organization, and Type of Income
1.16 Sources and Uses of Private Enterprise Income
6.12 Nonfarm Proprietors' Income by Industry

BEA also prepares nominal, or "current-dollar" estimates of nonfarm proprietors' income that are not seasonally adjusted; these are available in Section 8 of the NIPA Interactive Data Tables.

The Internal Revenue Service (IRS) also prepares measures of nonfarm proprietors' income; specifically, estimates of the net profit (less loss) of nonfarm proprietorships and partnerships. The estimates are derived from tax returns as part of the Statistics of Income (SOI) program and form the basis of BEA's nonfarm statistics; BEA presents the relationship between them in "Table 7.14 Relation of Nonfarm Proprietors' Income in the National Income and Product Accounts to Corresponding Measures as Published by the Internal Revenue Service." A reproduction of table 7.14 appears in the technical note at the end of this chapter, "Adjustments to IRS Source Data for Nonfarm Proprietors' Income." Additionally, as noted above, NIPA table 7.13 presents the relationship between IRS measures of depreciation and BEA measures of consumption of fixed capital for corporations and for nonfarm sole proprietors and partnerships.

Overview of Source Data and Estimating Methods

As described earlier in the handbook, most of the NIPA estimates are prepared using a wide variety of source data (see "Chapter 3: Principal Source Data") and using estimating methods that adjust the source data to the required NIPA concepts and that fill in gaps in coverage and timing (see "Chapter 4: Estimating Methods"). Table 11.A at the end of this chapter summarizes the source data and estimating methods that are used to prepare the most recent annual estimates and the current quarterly estimates of nonfarm proprietors' income for the industry categories shown in NIPA table 6.12; the benchmark and other annual estimates for all industries are derived using the same source data and methods and are described below. The source data and methods for the current quarterly estimates reflect both seasonally adjusted and not seasonally adjusted estimates unless otherwise noted.

Annual estimates (except most recent year)

Tabulations of income from individual income tax returns are prepared by the IRS and are published in the fall issues of the *Statistics of Income Bulletin*. The tabulations for sole proprietorships are based on a stratified random sample of individual tax returns, and the tabulations for partnerships are based on a stratified random sample of information returns; each

provides universe totals by NAICS industry for many of the items on the returns, including receipt and expense items.

The IRS tabulations become available about two years after the year to which they refer, and this timing determines the incorporation of these data into the NIPA estimates. For example, in the July 2017 annual update of the NIPAs, the IRS tabulations for 2015 were the primary source for the estimates for that year; the IRS provides the data prior to its fall publication so that it can be incorporated in the annual update of the NIPAs. The estimates for the most recent year, 2016, were obtained by extrapolating the 2015 estimates (see the section "Most-recent-year estimates").

The starting point for the NIPA estimates of income for nonfarm sole proprietorships (except for those proprietors that are primarily engaged in real estate) is the measure of "Net profit (less loss) of nonfarm proprietorships and partnerships, plus payments to partners, IRS" (line 1), based on the IRS measure of "net income less deficit." "Guaranteed payments to partners" reflects the compensation of partners for the use of capital or services that are separate from the distribution of partnership income. For partnership income (except for those primarily engaged in real estate), the starting point is the IRS measure of "ordinary business income (loss); for the income of sole proprietorships or partnerships that are primarily engaged in real estate, the starting point is the IRS measure of "net rental real estate income (loss)" and "other net rental income (loss)" from Form 1065 schedule K.[8]

Adjustments to the IRS tax return data

The by-industry IRS totals are adjusted by BEA as described below; a reconciliation of the IRS and the NIPA measures is presented annually in NIPA table 7.14, which is reproduced for the year 2015 below and discussed in detail in the technical note at the end of this chapter.

Table 11.2—Relation of Nonfarm Proprietors' Income in the National Income and Product Accounts to Corresponding Measures as Published by the Internal Revenue Service
[Billions of dollars]

Line in NIPA table 7.14	NIPA line item	2015

[8] Rental income of persons who are not primarily engaged in real estate is included in the NIPA measure of "rental income of persons."). The IRS measure of "net income less deficit" is derived from tabulations of "net profit or loss" from IRS Form 1040 Schedule C; "ordinary business income (loss) is from Form 1065; and "net rental real estate income (loss)" and "other net rental income (loss)" are from Form 1065 Schedule K.

1	**Net profit (less loss) of nonfarm proprietorships and partnerships, plus payments to partners, IRS**	**831.7**
2	Plus: Adjustment for misreporting on income tax returns	672.3
3	Posttabulation amendments and revisions[1]	-411.1
4	Depletion on domestic minerals	1.4
5	Adjustment to depreciate expenditures for mining exploration, shafts, and wells	4.7
6	Bad debt expense	17.2
7	Income received by fiduciaries	1.8
8	Income of tax-exempt cooperatives	7.5
9	Adjustment to depreciate expenditures for intellectual property products[2]	5.1
10	Disaster adjustments (net)[3]	0.0
11	**Equals: Nonfarm proprietors' income, NIPAs**	1,130.8

[1] Consists largely of an adjustment to expense all meals and entertainment, of oilwell bonus payments written off, of adjustments for corporate partners and statutory employees, of interest income, of residential real estate disposal costs and of margins on owner-built housing.
[2] Intellectual property products consists of software, research and development, and entertainment, literary, and artistic originals.
[3] Consists of disaster losses valued at historic-cost less net insurance receipts for disaster-related losses valued at replacement cost.

The major adjustments to this starting measure consist of:

- Adjustments for the misreporting of income (line 2), based on IRS audit data, on information returns, and on Census Bureau studies that match current population surveys with Social Security administrative records and IRS tax returns;
- Posttabulation amendments and revisions (line 3) to account for differences between tax accounting and national income accounting definitions;
- Adjustments to add back in measures that are treated by the IRS as deductions but that are not elements of costs of current production in the NIPAs: IRS depletion on domestic minerals (line 4), IRS expensing of expenditures for mining exploration, shafts, and wells (line 5), IRS bad debt expense (line 6), IRS expensing of

expenditures for intellectual property products (line 9); this adjustment also includes net disaster adjustments (line 10);

- Adjustments to add income that is excluded from IRS tabulations: fiduciaries (line 7), and tax exempt cooperatives (line 8).

Most-recent-year estimates

The estimates for the most recent year are prepared by extrapolating the estimates for the preceding year (for a general description of the extrapolation method, see "Interpolation and extrapolation using an indicator series" in chapter 4). The extrapolations are carried out separately for each industry using indicators that are based on a variety of sources, including Bureau of Labor Statistics (BLS) data (primarily on employment, average weekly hours, and average hourly earnings); Census Bureau data (primarily on the value of residential construction put-in-place, on the value of manufacturers' shipments, and on merchant wholesalers' total sales); and BEA data (primarily on personal consumption expenditures and on real estate brokers' commissions).

The BLS data are the source for the indicators for the following industries: agriculture, forestry, fishing, and hunting; mining (except oil and gas extraction); utilities; transportation and warehousing; information; administrative and support and waste management services; most of finance and insurance; most of professional, scientific, and technical services; and other services. BEA estimates of PCE for related goods and services are the source for the indicators for the following industries: retail trade; education services, health care, and social assistance; arts, entertainment, and recreation; accommodation and food services; part of finance and insurance; and part of professional, scientific, and technical services.[9] Census data are the source for the indicators for the following industries: construction; manufacturing; and wholesale trade. BEA data on real estate brokers' commissions are the source for the indicators for real estate and rental and leasing industries.

[9] Information on the sources and estimating methods underlying BEA's measures of PCE for the goods and services noted in table 11.A, as well as other goods and services, is available in chapter 5 of this Handbook.

Current quarterly estimates

Seasonally adjusted current quarterly estimates are published only at aggregate levels and not by industry. They are derived by averaging the most recent monthly estimates that are available for the months of that quarter; monthly estimates are released as part of BEA's monthly personal income estimates.[10] The monthly seasonally adjusted estimates (which are also released only for the total and not by industry) are derived by interpolating and extrapolating the annual estimates by industry, in most cases using the same industry indicators as those used for the most-recent-year estimates (see table 11.A).

Not seasonally adjusted quarterly and monthly estimates are derived using the same methods as the seasonally adjusted estimates, using the not seasonally adjusted versions of the same source data or indicators.

[10] The monthly estimates of personal income, including nonfarm proprietors' income, are expressed at annual rates; consequently, the current quarterly estimates, also expressed at annual rates, may be derived by averaging the monthly estimates.

Monthly estimates are revised as many as five times, depending on the month. The first month of every quarter (January, April, July, and October) are revised five times. For example, the monthly estimate for January is first released as part of the personal income release in February, revised in that release in March, revised as part of each current quarterly release for the first quarter in April, May, and June, and finally revised as part of the annual update in July. The second month of every quarter is revised four times and the third month of every quarter is revised three times.

Table 11.A—Summary of Methodology Used to Prepare Estimates of Nonfarm Proprietors' Income		
Line in NIPA table group 6.12	Component	Most-recent-year and current quarterly estimates (Indicator series used to extrapolate prior annual estimate)
1	**Nonfarm proprietors' income**	
2	**Nonfarm proprietorships and partnerships**	
	Forestry, fishing, and related activities	BEA wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for forestry and fishing industry.
3	Mining	Oil and gas extraction: Federal Reserve Board industrial production index and BLS producer price index. Mining, except oil and gas: BEA wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for mining industry. Support activities for mining: BEA wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for mining industry.
	Utilities	BEA wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for utilities industry.
5	Construction	Value of residential and nonresidential construction put-in-place from Census data and additions and alterations from BEA composite series of Census building supply retail sales data and BLS remodelers' payroll data.
6	Manufacturing	
7	Durable goods	Manufacturers' shipments of durable goods from Census Bureau.
8	Nondurable goods	Manufacturers' shipments of nondurable goods Census Bureau.
9	Wholesale trade	Sales from total merchant wholesalers except manufacturers' sales branches and offices from Census Bureau.

Table 11.A—Summary of Methodology Used to Prepare Estimates of Nonfarm Proprietors' Income		
Line in NIPA table group 6.12	Component	Most-recent-year and current quarterly estimates (Indicator series used to extrapolate prior annual estimate)
10	Retail trade	PCE for retail trade excluding food services.
11	Transportation and Warehousing	BEA real wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for transportation and warehousing industry.
12	Information	BEA real wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for information industry.
13	Finance, insurance, real estate, rental, and leasing	
14	Finance and insurance	Securities, commodity contracts, and other financial investments and related activities: PCE for securities commissions. Credit intermediation and related activities, insurance carriers and related activities, and funds, trusts, and other financial vehicles: CES wages for each industry.
15	Real estate and rental and leasing	PCE for residential real estate brokers' commissions and other ownership transfer costs.
16	Professional and business services	
17	Professional Scientific, and Technical Services	
18	Legal Services	PCE for proprietary and public legal services.
19	Computer systems design and related services	BEA wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for computer systems designs and related services industry.

Table 11.A—Summary of Methodology Used to Prepare Estimates of Nonfarm Proprietors' Income		
Line in NIPA table group 6.12	Component	Most-recent-year and current quarterly estimates (Indicator series used to extrapolate prior annual estimate)
20	Miscellaneous professional, scientific, and technical services.[11]	BEA wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for other professional, scientific, and technical services industry.
21	Management of companies and enterprises; administrative and waste management services	BEA wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for management of companies and enterprises industry and for administrative and waste services industry.
22	Educational services, health care, and social assistance	
23	Educational services	PCE for education services provided by business and government.
24	Health care and Social Assistance	Ambulatory health care services: PCE for proprietary and government physician services. Hospitals: PCE for proprietary hospitals. Social assistance: PCE for proprietary and public child care providers, individual and family services, and vocational rehabilitation services.
25	Arts, entertainment, recreation, accommodation, and food services	
26	Arts, Entertainment, and Recreation	PCE for Arts, entertainment, and recreation.
27	Accommodation and Food Services	PCE for retail sales and balance of payments data.
28	Other services, except government	BEA wages and salaries based on CES data on employment, average weekly hours, and average hourly earnings for other services industry.

[11] Consists of accounting, tax preparation, bookkeeping, and payroll services; architectural, engineering, and related services; specialized design services; management, scientific, and technical consulting services; scientific research and development services; advertising and related services; and other professional, scientific, and technical services.

Technical Note: Adjustments to Data for Nonfarm Proprietors' Income

This technical note provides detailed descriptions of the adjustments that are made for consistency with NIPA concepts and definitions to the IRS tax return data on nonfarm proprietors' profits. These adjustments are published annually in "Table 7.14. Relation of Nonfarm Proprietors' Income in the National Income and Product Accounts to Corresponding Measures as Published by the Internal Revenue Service." A reproduction of this table is shown below in table 11.3.

Adjustments to IRS Source Data for Nonfarm Proprietors' Income

The starting point for the derivation of the estimates of nonfarm proprietors' income is "Net profit (less loss) of nonfarm proprietorships and partnerships, plus payments to partners, IRS" shown on line 1 in table 11.2 below. This measure is based on the all-industry total of the IRS item "net income less deficit" obtained from the *Statistics of Income Bulletin.* (This item differs from the IRS measure of total business receipts less total business deductions by the amount of "passive" activity losses that are excluded from the IRS measure of total deductions but that are included in the IRS measure of deficit.) The adjustments to the IRS data are discussed below in the order shown in the table.

Table 11.3—Relation of Nonfarm Proprietors' Income in the National Income and Product Accounts to Corresponding Measures as Published by the Internal Revenue Service
[Billions of dollars]

Line in NIPA table 7.14	NIPA line item	2015
1	**Net profit (less loss) of nonfarm proprietorships and partnerships, plus payments to partners, IRS**	**831.7**
2	Plus: Adjustment for misreporting on income tax returns	672.3
3	Posttabulation amendments and revisions[1]	-411.1
4	Depletion on domestic minerals	1.4
5	Adjustment to depreciate expenditures for mining exploration, shafts, and wells	4.7
6	Bad debt expense	17.2
7	Income received by fiduciaries	1.8
8	Income of tax-exempt cooperatives	7.7
9	Adjustment to depreciate expenditures for intellectual property products[2]	5.1
10	Disaster adjustments (net)[3]	0.0
11	**Equals: Nonfarm proprietors' income, NIPAs**	1,130.8

[1] Consists largely of an adjustment to expense all meals and entertainment, of oilwell bonus payments written off, of adjustments for corporate partners and statutory employees, of interest income, of residential real estate disposal costs and of margins on owner-built housing.
[2] Intellectual property products consists of software, research and development, and entertainment, literary, and artistic originals.
[3] Consists of disaster losses valued at historic cost less net insurance receipts for disaster-related losses valued at replacement cost.

Adjustment for misreporting on income tax returns (line 2). Adjustments are made to the SOI data to account for income that is underreported on employment tax returns and for income that is not reported at all because the individuals fail to file a tax return; together, these adjustments

have accounted for approximately 50 percent of proprietors' and partnership income in the NIPAs since the 1970s. There is an additional misreporting adjustment offset to remove wages that are incorrectly reported as income. This adjustment is part of the posttabulation amendments and revisions on line 3.

Underreported income. The estimates of underreported income are based on audits of individual employment tax returns undertaken as part of the IRS National Research Program (NRP) for 2001, 2006, and 2008-2010 as well as tax gap measures for various years from the previous IRS TCMP studies. Estimates of the underreporting of the income of sole proprietors are taken directly from the IRS studies for the years covered by the studies. The underreporting of income by partnerships is not separately identified in the IRS reports but is combined with the underreported income of S corporations. The partnership share of this measure is derived from the partnership share of reported business receipts of partnerships and S corporations, and when available, the partnership share shown in TCMP studies. The estimates for years not covered by IRS studies are derived by interpolating between TCMP and NRP years and judgmentally extrapolating after 2010.[12]

Nonreported income. The estimates of nonreported income are based on "exact-match" studies from the Census Bureau for various years before 2003 and each year from 2003 forward. These studies match records from the Census Bureau's Current Population Survey with individual IRS tax returns and provide industry-level measures of the total self-employment nonfarm income for those persons with validated social security numbers that did not file tax returns. Prior to 2003, estimates are interpolated for those years for which there are not "exact-match" studies.

Posttabulation Amendments and Revisions (line 3). This adjustment includes a number of items, including those described in table 11.4 below.[13]

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[12] The IRS Taxpayer Compliance Measurement Program (TCMP) had provided estimates of misreported income for selected years since 1963. In 2001, the IRS launched the NRP to update the research and to reflect a changing economy, revisions to the tax code, and shifts in individual behavior.

[13] The posttabulation amendments and revisions that are not described in table 11.4 are very small. They include an adjustment to include the capital gains or losses of real estate developers because their function is trade rather than holding assets for profits and therefore reflects income from production; the exclusion of Section 1231 adjustments – that is, the capital gains or losses on real property because they do not reflect income from current production; and the inclusion of the income earned by newspaper carriers that is excluded from the SOI data.

Table 11.4 Current Posttabulation Amendments and Revisions to IRS "Net profit (less loss) of Nonfarm Proprietorships and Partnerships, plus payments to partners"

Adjustment	Estimate (Billions of dollars, 2015)	Type and purpose of adjustment	Sources and Methods
Portfolio interest	$129	Definitional adjustment: To reflect the interest received by financial partnerships.	Adjustments are based on partnership SOI tabulations of portfolio interest income for selected industries.
Corporate partners net income	-$151.1	Definitional adjustment: to reflect the inclusion of corporate partnership income in corporate profits and its exclusion from nonfarm proprietors' income.	Total NIPA partnership income allocated according to corporate share of income distributed to partners from SOI.
Double counting adjustment	-$103.3	Statistical adjustment: To avoid the double counting of income received by partnerships from other partnerships.	SOI tabulations of partnership income by type of partner to derive shares applied to total NIPA partnership income.
Meals and entertainment adjustment	-$35.6	Definitional adjustment: To treat all the expenses for business meals and beverages and entertainment as expenses in calculating nonfarm proprietors' income.	SOI tabulations of business meals and entertainment expenses.
Interest passed through to partners	-$93	Definitional adjustment: To exclude from income the interest paid to purchase property held for investment.	SOI tabulations of Schedule K-1.
Foreign distribution adjustment	-$127.1	Definitional adjustment: To remove from partnership income that income that is from sources outside of the United States.	Net income from foreign sources derived by applying the percent of S-corporation gross income that is foreign deductions applied to gross income from SOI.
Misreported wages	-$7.0	Definitional adjustment: To remove from nonfarm proprietors' income employee wages that are misreported as income of sole proprietors; the same amount is added to wages and salaries.	Audits of individual employment tax returns undertaken as part of the IRS National Research Program (NRP).

Depletion on domestic minerals (line 4). Natural resource discoveries are not considered to be capital formation in the NIPAs; consequently, depletion—the charge for the using up of these resources—is not a charge against current production. In contrast, the IRS permits depletion to be charged as an expense. Through this adjustment, the SOI expense "depletion" is reduced by the domestic depletion claimed on tax returns, thereby increasing net income. The adjustment is based on SOI tabulations of depletion.

Adjustment to depreciate expenditures for mining exploration, shafts, and wells (line 5). Expenditures for mining exploration, shafts, and wells are treated as capital formation in the NIPAs. In contrast, the IRS permits some of these expenditures to be charged as current expense. Therefore, the SOI measures of depreciation, by industry, are adjusted to remove the expensed portion of the current year's investment and to add a charge for the depreciation of the investments made in the current and in previous years.

The capital formation of drilling and oil well casing is estimated from the American Petroleum Institute's *Joint Association Survey on Drilling Costs* and BLS producer price indexes (PPIs). For oil well casing, the quantity is valued using the PPI for casing. For drilling, the quantity is valued using data in the Joint Survey. Expenditures for exploration are obtained from the Annual Survey of Oil and Gas. Expenditures for mine shafts are extrapolated from Census data. The value of the capital formation is depreciated over average service lives of 20 years by geometric depreciation.

Bad debt expense (line 6). Bad debt expenses are not considered to be expenses associated with current production and thus should not be reflected as expenses in calculating NIPA profits. The adjustment removes these expenses, based on the bad-debt expense item in the SOI tabulations.

Income received by fiduciaries (line 7). Sole proprietors that act as fiduciaries (trustees, guardians, executors of trusts or estates) file IRS Form 1041 instead of Form 1040, and they are therefore excluded from SOI tabulations of proprietorships and partnerships. This adjustment adds their income, based on separately available SOI data for 1950, 1974, and 1985. For other years, gross profits, depreciation, and other deductions are extrapolated separately using corresponding items for nonfiduciary sole proprietorships as reported in the SOI tabulations.

Income of tax-exempt cooperatives (line 8). This adjustment is the sum of separate adjustments for each type of "other" private business—specifically, rural electric cooperatives, rural telephone cooperatives, and farmers' marketing cooperatives that are not included in the SOI tabulations because of their tax-exempt status. The adjustments for rural electric and telephone cooperatives are based on annual data from the USDA's Rural Electrification Administration. The adjustment for farmers' marketing cooperatives estimates the patronage dividends earned by these cooperatives based on sales data and profit margins data provided by USDA's Farmer Cooperative Service.

Adjustment to depreciate expenditures for intellectual property products (line 9). Expenditures for intellectual property products are treated as capital formation in the NIPAs.[14] In contrast, the IRS permits some of these expenditures to be charged as current expense. Therefore, the IRS data are adjusted to remove the expensed portion of the current year's investment and to add depreciation charges on investment made in the current and in previous years. This adjustment is described briefly in table 11.5 below.

Table 11.5—Adjustment to Depreciate Expenditures for Intellectual Property Products

Adjustment	**Estimates (Billions of dollars, 2015)**	**Type and purpose of adjustment**	**Sources and methods**
Research and development	3.9	Definitional adjustment: Business and government expenditures for research and development are recognized as fixed investment.	Adjustments are primarily based on BEA investment data, which in turn, are based on National Science Foundation survey data.
Software	1.1	Definitional adjustment: Business and government expenditures for software are recognized as fixed investment.	Adjustments are primarily based on BEA investment data, which in turn, are based on Census Bureau economic census and survey data and on Bureau of Labor Statistics survey data.
Entertainment, literary, and artistic originals	0.2	Definitional adjustment: Business and government expenditures for entertainment originals are recognized as fixed investment.	Adjustments are primarily based on BEA investment data, which in turn, are based on Census Bureau economic census and survey data.

[14] As part of the 2013 comprehensive update of the NIPAs, BEA began treating expenditures on research and development and on entertainment, literary, and artistic originals as fixed investment and thus the depreciation of these assets as consumption of fixed capital. For more information on the treatment of these "intellectual property products," see "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts," *Survey* 93 (March 2013): 14–20; also see the technical note at the end of "Chapter 6: Private Fixed Investment."

Disaster adjustments (net) (line 10). In the NIPAs, the loss of capital as a result of a catastrophic disaster and the insurance payouts that result from them do not affect income associated with current production. The adjustment consists of (1) removing the net of the value of losses from depreciation (a current business expense) and (2) removing from current transfer payments the insurance payouts made by insurance companies.[15]

Depreciation estimates are based on data on insured damages at current cost, broken down by type, from the Insurance Service Office. The amount is adjusted for uninsured damages, distributed by industry according to regional impact using data from the Census Bureau's *County Business Patterns*, and converted to historic-cost depreciation using various service lives and price indexes. In contrast, the IRS allows all uninsured disaster losses to be charged as current business expenses in "other deductions" on Form 4684.

Insurance payouts and receipts are also based on data from the Insurance Service Office, supplemented by government insurance fund transactions. Income receipts are distributed by industry using the above information on historic-cost depreciation.

[15] In the 2009 comprehensive update, BEA introduced a new treatment of major disasters (those in which either the associated property losses or the insurance payouts exceed 0.1 percent of GDP) that records them as "changes in the volume of assets" rather than as consumption of fixed capital; see Eugene P. Seskin and Shelly Smith, "Preview of the 2009 Comprehensive Revision of the NIPAs: Changes in Definitions and Presentations," *Survey* 89 (March 2009): 11–15.

CHAPTER 12: RENTAL INCOME OF PERSONS

(Updated: October 2019)

Definitions and Concepts
Recording in the NIPAs
Overview of Source Data and Estimating Methods
Benchmark year estimates
Nonbenchmark annual estimates
Current quarterly estimates
Table 12A--Summary of Methodology for Rental Income of Persons

Rental income of persons reflects the income earned by persons for the provision, to others, of their property. The featured measure of rental income of persons—rental income of persons with capital consumption adjustment—is provided net of depreciation and the costs associated with providing property. As such, it can be viewed as a "profit-like" measure.

In the summary NIPA tables, rental income of persons is a component of gross domestic income and of national income for the total economy, as well as measures of personal income and of private enterprise income.

Definitions and Concepts

Rental income of persons reflects the income that accrues from the provision of property (i.e., housing or other structures, equipment, intellectual property, or natural resources) owned by persons who are resident in the United States.[1] As shown in the sample of NIPA table 7.9 below, separate measures of rental income are provided for legal forms of organizations—for "other private business" and for "households and nonprofit institutions."[2] The NIPAs classify persons that own property as either part of the household and NPISH sector or as part of the business sector. Specifically, individuals that rent property and are required to report rental and royalty income on the IRS individual income tax return, and tax-exempt cooperatives, are classified as part of "other private business," a subsector of the NIPA business sector.[3] Individuals that occupy the homes that they own are treated as unincorporated businesses and are classified in the household and institutions sector. Because both types of property owners reflect individuals or households, their rental and royalty incomes are included in the

[1] Persons resident in the United States are those who are physically located in the United States and who have resided, or expect to reside, in this country for 1 year or more. For more information on residence, see "Definitions and Concepts" in Chapter 8: Net Exports of Goods and Services" of this handbook.
[2] For more information on legal forms, see chapter 2 of this handbook.
[3] Rental and royalty income are reported on IRS Schedule E, Supplemental Income and Loss, a section of the individual income tax return. "Other private business" also includes entities that are not required to file but would be so required if they met size or income criteria.

NIPA measure of rental income of persons (and therefore, as a component of personal income).[4] The NIPAs also provide measures of income from the rental of property owned by persons who are classified as proprietors or partnerships (included in proprietors' income), by corporations (in corporate profits), and by governments (as part of government rents and royalties).

As noted in "Chapter 2: Fundamental Concepts," the NIPA production boundary for households is limited to the housing services provided by homeowners to themselves ("owner-occupied housing") and the production of domestic services (e.g., market cleaning services). Thus, the rental income of households is limited to the services of owner-occupied housing. The provision of nonresidential properties, of rights to intellectual and natural resources, and of permanent-site housing services to tenants more closely resembles business activity; as such, it is recorded as production and income of other private business or of NPISH. Measures of nonmarket household production, such as housework and childcare, are excluded from the NIPAs.[5] The incomes associated with the production by households of other market goods and services are recorded as proprietors' income.[6]

Separate measures of rental income are provided by type of property and by type of occupant. Specifically, for other private business, separate measures are prepared for rental income from farm and nonfarm tenant-occupied permanent-site housing, from nonresidential properties (structures, equipment, and the real estate investments of private pension plans), and from the rights to intellectual property and natural resources (recorded as royalties). For households and NPISH, measures are prepared for rental income from nonfarm owner-occupied permanent-site dwellings and manufactured homes, from farm owner-occupied housing, and from tenant-occupied housing owned by NPISH. By convention, all rental income of persons from tenant-occupied housing is recorded as other private business or as NPISH; also by convention, rental income from tenant-occupied manufactured homes owned by persons is recorded as proprietors' income.

Table 12.1 shows the types of transactions that are included in, and excluded from, rental income of persons.

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[4] The NIPAs also provide measures of the income and outlays of the households and institutions sector that exclude the income of "other private business," and, as part of the 2003 comprehensive revision of the NIPAs, BEA began providing separate estimates of household and of NPISH income and outlays; see Charles Ian Mead, Clinton P. McCully, and Marshall B. Reinsdorf, "Income and Outlays of Households and of Nonprofit Institutions Serving Households," *Survey of Current Business* volume 83 (April 2003): 13-17. Additionally, the NIPAs provide measures of saving and investment of households and institutions sector that exclude "other private business."

[5] BEA has prepared alternative measures of household output that include the value of nonmarket household production; see Benjamin Bridgman, "Accounting for Household Production in the National Accounts," *Survey*, volume 96 (February 2016): 1-5.

[6] Before 2003, the services of owner-occupied housing were also classified as output of the business sector. As part of the 2003 comprehensive revision of the NIPAs, owner-occupied housing was reclassified to the households and institutions sector to reflect the fact that the housing in this case is produced by households for their own use and is not sold on the market.

Table 12.1 Content of Rental Income of Persons

Category of transaction	Comments
Tenant-occupied housing	Includes tenant-occupied nonfarm permanent-site housing owned by individuals and by NPISH. Includes tenant-occupied farm permanent-site housing and other structures owned by farm operator landlords. Includes land and structures owned by nonoperator farm landlords that are not primarily engaged in the production of crops or livestock. Excludes manufactured housing. Excludes expenses associated with property ownership and rental services.
Owner-occupied housing	Includes housing services provided by farm and nonfarm owner-occupied permanent-site housing and by nonfarm owner-occupied manufactured housing. Excludes expenses exclusively associated with rental services.
Nonresidential properties	Includes structures, equipment, and the rental income of private employee pension funds (imputed to persons). Excludes expenses associated with property ownership and rental services.
Royalties	Includes royalties for the provision of rights to natural resources and intellectual property.
Capital consumption adjustment	Conversion of tax-based measures of depreciation at historical cost to economic depreciation at current cost measures.

The bulk of rental income of persons (about 73 percent in 2017) is generated from the provision of housing services by households and NPISH; specifically, from owner-occupied housing (households). The remainder (about 27 percent) is generated from the provision by other private business of tenant-occupied housing, of nonresidential properties, and of rights to intellectual property and natural resources.

Table 7.9. Rental Income of Persons by Legal Form of Organization and by Type of Income

[Billions of dollars]

Line		2017
1	**Rental income of persons with capital consumption adjustment**	**730.2**
2	**Other private business**	**199.6**
3	Tenant-occupied housing	157.4
4	Nonfarm tenant-occupied permanent site housing	157.2
5	Farm tenant-occupied housing owned by farm operator landlords	0.1
6	Farms owned by nonoperator landlords[1]	9.8
7	Nonfarm nonresidential properties[2]	0.4
8	Royalties	32.0
9	**Households and nonprofit institutions**	**530.6**
10	Nonfarm owner-occupied housing	515.4
11	Permanent site	504.6
12	Manufactured homes	10.8
13	Farm owner-occupied housing owned by farm operators	3.0
14	Tenant-occupied housing owned by nonprofit institutions	12.2
	Addendum:	
15	Rental income with capital consumption adjustment (1-8)	698.2

1. Includes housing, service structures, and land.

2. Includes rental income of private employee pension funds imputed to persons.

As the measure of rental income of persons includes income from nonresidential structures and from royalties, it is not an exclusive measure of the income generated by housing services. Table 7.9 also includes a measure of "rental income with capital consumption adjustment" that excludes royalty income and is therefore more conceptually aligned with the provision of tangible property; however, it includes income from the provision of structures and equipment, as well as housing. Neither is rental income of persons a comprehensive measure of the income generated by housing, as housing services are also provided by governments, by corporations, and by proprietors and partnerships. Given the importance of housing to the health of the economy, the NIPAs also provide measures that reflect the production and income of an alternative "housing" sector, of which the households and institutions sector is only a part; these measures reflect the output associated with housing—and only housing—provided by all owners.[7] Measures of final expenditures for housing services that are consistent with the output of the housing sector are reflected in BEA's estimates of personal consumption expenditures.

The inclusion in rental income of persons of income from tenant-occupied permanent-site housing, from nonresidential properties, and from rights to intellectual property or natural resources is straightforward; as explained in chapter 2, the income approach measures GDP—or gross domestic income (GDI)—as the sum of the income

[7] Measures for the housing sector are discussed in Mayerhauser, Nicole and Marshall Reinsdorf, "Housing Services in the National Economic Accounts," September 2007.

payments and other costs incurred in the production of goods and services, and rental income of persons reflects income payments for the production of housing and other property services. The inclusion of income from owner-occupied housing (both permanent-site and manufactured homes) in rental income of persons warrants further explanation. As noted in chapter 2, purchases of newly constructed housing are treated as private fixed investment rather than as consumption expenditures in the NIPAs, and the stock of housing is treated as fixed assets. The housing stock provides a flow of housing services that are consumed by persons who rent their housing and by persons who own the housing they occupy (referred to as "owner-occupiers"). In the NIPAs, owner-occupiers are treated as owning unincorporated enterprises that provide housing services to themselves in the form of the rental value of their dwellings.[8] Thus, personal consumption expenditures (PCE) for housing services includes both the monetary rents paid by tenants and an imputed rental value for owner-occupied dwellings (measured as the income the homeowner could have received if the house had been rented to a tenant), and rental income of persons includes the monetary income earned by landlords and an imputed rental income earned by owner-occupiers. This treatment is designed to make PCE, GDP, and the incomes associated with them invariant to whether the house is rented by a landlord to a tenant or is lived in by the homeowner.

The imputation also increases the international comparability of the NIPAs because rates of home ownership differ significantly from country to country; by including both tenant-occupied and owner-occupied housing services in output and income measures, comparisons are not affected by these differences.

It is also worth noting that as a component of income, depreciation—a cost incurred in production—is reflected in the measures of rental income, as shown in table 12.1 above. As much of the source data underlying BEA's measures of depreciation are based on tax-accounting information, the source data must be adjusted to reflect consistent economic-accounting measures that are valued at current-replacement cost. The capital consumption adjustment (CCAdj) is a two-part adjustment that (1) converts depreciation measures that are based on a mixture of service lives and depreciation patterns specified in the tax code to measures that are based on uniform service lives and empirically based depreciation patterns; and (2) converts the measures to a current-cost basis by removing from rental income the capital-gain-like or capital-loss-like element that arises from valuing the depreciation of fixed assets using prices from earlier periods (i.e. prices at the time the asset was acquired).[9]

[8] This treatment is consistent with that of the international *System of International Accounts* (SNA): "Households that own the dwellings they occupy are formally treated as owners of unincorporated enterprises that produce housing services consumed by those same households" (SNA 2008: 6.117).

[9] For information on the derivation of the CCAdj, see *Fixed Assets and Consumer Durable Goods in the United States, 1925–97*, September 2003, available on BEA's website at www.bea.gov.

Recording in the NIPAs

As described in chapter 2, the NIPAs can be viewed as aggregations of accounts belonging to individual transactors in the economy. In the seven summary accounts of the NIPAs, "rental income of persons with capital consumption adjustment" appears as an income component in the Private Enterprise Income Account (account 2) and in the Personal Income and Outlay Account (account 3). Additionally, it is a component of national income and, as a component of net operating surplus, it is reflected in gross domestic income (GDI) in the Domestic Income and Product Account (account 1).

In the NIPAs, rental income of persons is a component of national income and is shown by sector and by legal form of organization for other private business, for households, and for NPISH. The following is a list of the principal NIPA tables that present annual and, in some cases, quarterly, current-dollar estimates of rental income of persons with capital consumption adjustment as a component of GDI and of national income.[10]

1.10 Gross Domestic Income by Type of Income (A) (Q)
1.11 Percentage Shares of Gross Domestic Income (A)
1.12 National Income by Type of Income (A) (Q)
1.13 National Income by Sector, Legal Form of Organization, and Type of Income (A)
1.16 Sources and Uses of Private Enterprise Income (A)
7.4.5 Housing Sector Output, Gross Housing Value Added, and Net Value Added (A)
7.9 Rental Income of Persons by Legal Form of Organization and by Type of Income (A)
7.12 Imputations in the National Income and Product Accounts (A)

BEA also prepares nominal, or "current-dollar" estimates of rental income of persons that are not seasonally adjusted; these are available in Section 8 of the NIPA Interactive Data Tables.[11]

Overview of Source Data and Estimating Methods

As described earlier, NIPA estimates, including those for rental income of persons, are prepared using a wide variety of source data (See "Chapter 3: Principal Source Data") and using estimating methods that adjust the source data to the required NIPA concepts and that fill in gaps in coverage and timing (see "Chapter 4: Estimating Methods"). For rental income of persons, the estimates are based on statistical surveys

[10] The NIPAs also present annual and quarterly aggregate estimates of rental income of persons in NIPA table group 2 as a component of personal income. Annual and quarterly estimates of aggregate rental income of persons are available in table 2.1; quarterly and monthly estimates are available in table 2.6. BEA also prepares state and local area estimates of rental income of persons as part of its regional economic accounts.
[11] Go to www.bea.gov; select "Tools," "Interactive Data," "GDP and Personal Income," and then "Begin using the data."

and reports primarily from the Census Bureau, the Federal Reserve Board, the Internal Revenue Service (IRS), and the Office of Management and Budget, as well as from private organizations such as Black Knight Financial Services.[12]

Table 12.A following the main text summarizes the source data and estimating methods that are used to prepare the current-dollar benchmark, nonbenchmark, and current quarterly estimates for rental of income of persons as shown by legal form of organization and by type of income in NIPA table 7.9. The source data and methods for the current quarterly estimates reflect both seasonally adjusted and not seasonally adjusted estimates unless otherwise noted.

Benchmark year estimates

For all dwellings, rental income is equal to the rental value of the dwelling, as reflected in BEA's measures of personal consumption expenditures (PCE) for housing services, less the expenses associated with owning the property, and plus any subsidies related to the property. (The estimates of PCE for housing services are described in detail in "Chapter 5: Personal Consumption Expenditures"). Housing-related expenses are deducted because they are considered intermediate inputs to the production of the rental services and as such, they are already reflected in the rent charged for the service. In contrast, subsidies are added because it is assumed that owners reduce the rents they charge by the value of any property-related subsidies they receive.

For *nonfarm tenant-occupied permanent site housing*, the measure of rental value reflected in PCE is based on the rent paid by tenants.[13] The data on rental value as well as the data on expenses and subsidies described below cover all owners—that is, corporations, proprietors, and individuals. Therefore, once total expenses are deducted from, and total subsidies are added to, the rental value, a portion of total rental income is allocated to corporations, proprietors, and partnerships based on data on the percentage of rental receipts that is received by businesses from the Census Bureau's decennial Census of Housing Residential Finance Survey. The residual is allocated to individuals (other private business) and to NPISH based on the percentage of permanent-site rental units that each provide, from the same data source.[14]

Expenses for nonfarm dwellings include mortgage interest paid, maintenance and repairs, property taxes, property insurance, financial costs associated with obtaining mortgages (origination fees, credit reports, and adjustment and collections services), depreciation, and other housing costs (condominium and cooperative fees, mortgage

[12] Black Knight Financial Services was formerly Lender Processing Services Applied Analytics.
[13] The rent paid is adjusted to exclude any utility payments, as they are already accounted for elsewhere in PCE, and to include tenant expenditures for major replacements, maintenance, and repairs that are not reimbursed by the landlord owner, as they are considered part of the rental cost to the tenant.
[14] The percentages have been held constant since the discontinuation of the survey in 2001.

guaranty insurance, property management fees, imputed bank service charges, advertising, pool maintenance, and "all other").

Data on expenses come from various sources, including BEA's benchmark input-output accounts, the Census Bureau's censuses of governments and of housing, and the Federal Housing Finance Agency. For each type of expense, the data cover both tenant-occupied and owner-occupied housing. BEA allocates each expense between the two based on data from BEA's benchmark input-output accounts, unpublished source data, or judgmental trends.

Subsidies are added to either tenant- or owner-occupied housing based on the nature of the subsidy. For tenant-occupied housing, the following subsidies are added:

- **Section 8:** This program provides rental assistance payments to landlords on behalf of low-income tenants. Estimates are provided by type of landlord (nonprofit, private, and state and local enterprises).
- **Section 236**: Under the Housing and Urban Development Act of 1968 (Rental Housing Assistance Program) the federal government subsidizes the monthly mortgage payment that a qualified owner of a rental or cooperative project is required to make. This subsidy reduces rents for lower income tenants
- **Rural housing service (RHS):** Under the Rental Assistance Program, the U.S. Department of Agriculture's RHS provides assistance to tenants through the Rural Rental Housing or Farm Labor Housing projects.
- **Other housing subsidies:** Includes rental assistance and affordable housing programs provided by other public enterprises.
- **Current surplus of government enterprises:** For state and local enterprises that provide housing, net operating income is comprised of federal subsidies and rental payments received by tenants, less expenses. It is measured as the current surplus of these government enterprises.

For *nonfarm owner-occupied permanent site housing*, the PCE measure of rental value is imputed based on measures of the rental value of tenant-occupied dwellings of similar size and value. This approach assumes that owner-occupied units of similar size and value have similar rent-to-value ratios.[15] For owner-occupied units, the value of utilities may be imbedded in the source data, but adjustments are not made to exclude them because reliable source data with which to do so are not available.

As noted above, the aggregate measure of each type of expense is allocated between, and then deducted from, tenant- and owner-occupied housing based on various source data; the expenses deducted from owner-occupied housing are the same as those for tenant-occupied housing with the exception of property management fees, imputed bank service charges, and advertising, which are only deducted from tenant-occupied housing. For owner-occupied housing, the following subsidies are added:

[15] According to the SNA, "The ratio of owner-occupied to rented dwellings can vary significantly…so both international and inter-temporal comparisons of the production and consumption of housing services could be distorted if no imputation were made for the value of own-account housing services." (SNA 2008: 6.34).

- **Section 235:** The Housing and Urban Recovery Act of 1983 program subsidizes the interest payments of eligible homeowners for 10 years.
- **Federal Emergency Management Agency (FEMA**): FEMA provides disaster-related subsidy payments for temporary housing, repairs, mortgage and rental assistance, etc.
- **Road Home Grants:** The Road Home program was a Federal grant to the states of Louisiana and Mississippi to aid persons displaced by Hurricanes Katrina and Rita. The program, which provided subsidies for property repairs, operated from 2007 to 2018.

For *owner-occupied manufactured homes*, the PCE measure of rental value is estimated as the product of the rent per unit of tenant-occupied manufactured homes and the ratio of the average number of rooms in owner-occupied manufactured homes to those in tenant-occupied manufactured homes. The expenses deducted from this measure include "contract site rent"—the charge for the site upon which the home is located—as well as mortgage interest paid, property taxes, consumption of fixed capital, and miscellaneous other costs (including property insurance and maintenance and repairs). Subsidies are not added in the measurement of rental income from manufactured homes. As noted previously, rental income of persons does not include income from tenant-occupied manufactured homes, which is instead recorded as business income.

For *farm housing*, estimates of rental value, expenses, and subsidies are all based on data from the United States Department of Agriculture (USDA) with two exceptions. Measures for capital consumption allowances come from the IRS Statistics of Income (SOI) program, and measures of the consumption of fixed capital come from BEA's Fixed Assets Accounts.[16] For *farm tenant-occupied housing owned by farm operator landlords*, the rental value is adjusted to exclude expenses for maintenance and repairs, capital consumption allowances, real estate taxes, mortgage interest, property insurance, and the compensation paid in kind (in the form of housing) to hired labor. For *farms owned by nonoperator landlords*, (those that are not primarily engaged in the production of crops or livestock) the rental value includes the value of housing, nonresidential structures, and land, and is based on the USDA measure of agricultural net rent, which is net of expenses and includes government payments to nonoperator landlords.[17] For *farm owner-occupied housing owned by farm operators*, the USDA measure of the rental value is adjusted to exclude expenses for maintenance and repairs, consumption of fixed capital, real estate taxes, mortgage interest, and property insurance. No subsidies are added.

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[16] The NIPAs reclassified the rental income associated with farm housing to the household and NPISH sector as part of the 2003 NIPA comprehensive revision; previously, it was recorded as part of farm proprietors' income. For more information, see Moulton and Seskin, "Preview of the 2003 Comprehensive Revision of the National Income and Product Accounts: Changes in Definitions and Classifications," *Survey* 83 (June 2003). The USDA continues to include the output of farm housing services as part of the farm sector in its farm income measures.

[17] For farms that are primarily engaged in production of crops or livestock, rental income is included in farm proprietors' income.

For *tenant-occupied housing owned by nonprofit institutions*, the measure of the rental value is derived and allocated between individuals and NPISH as described above. Deducted expenses include property taxes, mortgage interest, depreciation, property insurance, maintenance and repairs, and administrative expenses.

For *nonfarm nonresidential properties*, rental income is estimated by multiplying BEA's measures of the nonfarm nonresidential capital stock of structures and equipment owned by persons by an estimated rate of return on these assets. The rate of return on these assets is estimated by dividing the profits of corporate real estate operators and lessors of buildings, based on SOI data, by the value of their depreciable assets, also based on SOI data. The rental income of private employee pension funds imputed to persons is added to the total measure, based on data from the Federal Reserve Board.

For *royalty income* from intellectual property and from the rights to natural resources, rental income is equal to the net royalties received by individuals, by fiduciaries, and by nonprofit organizations less the expense of bonus payments for drilling rights for what are ultimately found to be "dry holes." Data are primarily from the IRS SOI program.

Nonbenchmark annual estimates

Estimates for nonbenchmark years are generally prepared at the same level of detail as those for benchmark years. Nonbenchmark annual estimates of the rental value reflected in PCE for all nonfarm housing are extrapolated from the benchmark values as described in chapter 5; nonbenchmark annual estimates of expenses and subsidies are extrapolated based on various source data or by judgmental trend, as described in table 12.A.

For farm housing, annual measures are derived using the same source data and methodologies as the benchmark estimates.

For nonresidential structures and for royalty income, annual measures are derived using the same source data and methodologies as the benchmark estimates.

Current quarterly estimates

The seasonally adjusted quarterly current-dollar estimates of the rental values reflected in PCE for all housing are prepared by reflating the estimates of real PCE for each type of dwelling using the CPI for rent of primary residence for tenant-occupied dwellings and the CPI for owners- equivalent rent of primary residence for owner-

occupied dwellings.[18] For expenses and subsidies, quarterly values are extrapolated based on various source data or by judgmental trend, as described in table 12A. For nonresidential structures and for royalty income, current quarterly estimates are primarily derived by judgmental trend.

The not seasonally adjusted current quarterly estimates of rental income of persons are derived using the same methods as the seasonally adjusted current quarterly estimates, using the not seasonally adjusted versions of the same indicators.

[18] As a component of the product-side measure of personal consumption expenditures, BEA prepares real (inflation-adjusted) measures of personal consumption expenditures for housing services; most income measures, including rental income of persons, are not adjusted for inflation. For more information on the derivation of inflation-adjusted measures, see "Price and Quantity Estimates in chapter 4 of this handbook. For more information on the derivation of real consumption expenditures for housing services, see "Quantity and price estimates" in chapter 5.

Table 12.A—Summary of Methodology Used to Prepare Rental Income of Persons				
Line in NIPA table 7.9	**Component**	**Benchmark year**	**Nonbenchmark year**	**Current quarterly estimates**
			Indicator series used to interpolate and extrapolate*	
2	Other private business			
3	Tenant-occupied housing			
4	Nonfarm tenant-occupied permanent site housing	Rental value of tenant-occupied nonfarm housing less expenses and plus subsidies. Rental value of tenant-occupied nonfarm housing: Unit stocks and average rent based on Census Bureau COH. Expenses: Allocated portion of aggregate of unpublished measures: (1) Maintenance and repairs: 1997 benchmark I-O-based value extrapolated based on National Association of Realtors existing home sales forecasts. (2) Mortgage interest paid: 2009 value based on Residential Finance Survey (RFS) extrapolated based on FRB mortgage debt outstanding, effective rate of interest from Black Knight Financial Services, and BEA adjustments to include discount points based on FHFA data. (3) Property insurance: Direct premiums earned, investment income of policyholder reserves, and normal losses from AM Best. (4) Property taxes: Real estate taxes by size of housing unit from Census Bureau Census of Governments and RFS and unit stocks based on COH. (5) Financial costs: Rates of initial fees and charges from Federal Housing Finance Agency (FHFA). multiplied by mortgage originations from Freddie Mac. (6) Property management fees: benchmark I-O tables. (7) Consumption of fixed capital: IRS tabulations of capital consumption allowances and BEA's capital consumption adjustment estimates. (8) All other housing expenses: BEA's benchmark I-O tables. Subsidies: Aggregate of unpublished detail from	Rental value of tenant-occupied nonfarm housing, less expenses and plus subsidies. Rental value of tenant-occupied nonfarm housing: Unit stocks based on Census Bureau biennial AHS or on Census Bureau Current Population Survey; average rent based on AHS data or extrapolated based on CPI for rent of primary residence. Expenses: Tenant-occupied portion of aggregate of unpublished extrapolated measures: (1) Maintenance and repairs: same as benchmark year. (2) Mortgage interest paid: same as benchmark year. (3) Property insurance: same as benchmark year. (4) Property taxes: Growth rate in state and local tax collections from Census Bureau's quinquennial Census of Government and Annual Survey of State and Local Government Finances. (5) Financial costs: same as benchmark year. (6) Property management fees: same as benchmark year. (7) Consumption of fixed capital: same as benchmark year. (8) All other housing expenses: trade association data and judgmental trends. Subsidies: same as benchmark year.	Rental value of tenant-occupied nonfarm housing, less expenses and plus subsidies. Rental value of tenant-occupied nonfarm housing: For unit stocks, Census Bureau data on new privately-owned housing units completed. For average rent, CPI for rent of primary residence. Expenses: For mortgage interest paid, quarterly mortgage debt outstanding from FRB and monthly mortgage servicing data from Black Knight Financial Services. For financial costs, initial fees and charges from FHFA and mortgage originations from Freddie Mac and moving average of number of loan applications from Mortgage Bankers Association. For all other expenses, judgmental trend. Subsidies: Judgmental trend.

Table 12.A—Summary of Methodology Used to Prepare Rental Income of Persons				
Line in NIPA table 7.9	**Component**	**Benchmark year**	**Nonbenchmark year**	**Current quarterly estimates**
			Indicator series used to interpolate and extrapolate*	
		BEA's Federal Budget Translation, and unpublished NIPA detail on current surplus of government enterprises.		
5	Farm tenant-occupied housing owned by farm operator landlords	Gross rental value based on USDA data, less expenses (including property insurance, property taxes, mortgage interest, maintenance and repairs, and provision of housing as compensation in kind to hired labor), based on USDA data and less BEA data for consumption of fixed capital.	Same as benchmark year.	Judgmental trend.
6	Farms owned by nonoperator landlords	Net rent (excluding expenses and including government payments) based on USDA data.	Same as benchmark year.	Judgmental trend.
7	Nonfarm nonresidential properties	Sum of rental income from nonfarm nonresidential structures and equipment and rental income of private employee pension funds imputed to persons. For rental income from nonfarm nonresidential structures and equipment, gross stock from BEA's Fixed Assets Accounts multiplied by the rate of return to corporate real estate assets based on SOI data. For rental income from private employee pension funds imputed to persons**,** IRS tabulations of Form 5500 data on rental income from properties for 1984 extrapolated using FRB data on growth in miscellaneous assets of pension plans. Capital consumption allowances and capital consumption adjustment from BEA's Fixed Asset Accounts.	Same as benchmark year.	Judgmental trend.
8	Royalties	Net royalty of individuals less oil bonus payments. Net royalty income of individuals: Net royalties of fiduciaries from SOI plus judgmentally determined royalty income of nonprofit organizations. Oil bonus payments: Judgmentally determined based on SOI data on intangible drilling costs.	For years in which SOI data is available, same as benchmark year. For most recent year, extrapolated based on Industry account estimates of gross output of oil and gas extraction industries (NAICS 211).	Product of BLS producer price index for oil and gas extraction and FRB industrial production index for oil and gas extraction.
9	Households and nonprofit institutions			

Table 12.A—Summary of Methodology Used to Prepare Rental Income of Persons				
Line in NIPA table 7.9	**Component**	**Benchmark year**	**Nonbenchmark year**	**Current quarterly estimates**
			Indicator series used to interpolate and extrapolate*	
10	Nonfarm owner-occupied housing			
11	Permanent site	Imputed rental value of owner-occupied nonfarm permanent-site housing, less expenses and plus subsidies. Imputed rental value of owner-occupied nonfarm housing: Units stocks based on COH; average annual rent based on RFS. Expenses: Same as for nonfarm tenant-occupied permanent-site housing (excluding property management fees, imputed bank service charges, and advertising); for consumption of fixed capital, BEA's Fixed Assets Accounts. Subsidies: Aggregate of unpublished detail from BEA's Federal Budget Translation.	Imputed rental value of owner-occupied nonfarm housing, less expenses and plus subsidies. Imputed rental value of owner-occupied nonfarm housing: Unit stocks from AHS or Census Bureau Current Population Survey. Average rent extrapolated based on CPI for owners' equivalent rent. Expenses: Same as benchmark year. Subsidies: Same as benchmark year.	Imputed rental value of owner-occupied nonfarm housing, less expenses and plus subsidies. Imputed rental value of owner-occupied nonfarm housing: Unit stocks from Census Bureau data on housing completions; average rent same as for nonbenchmark years. Expenses: same as for nonfarm tenant-occupied permanent site. Subsidies: Judgmental trend.
12	Manufactured homes	Imputed rental value of owner-occupied nonfarm manufactured housing, less expenses and plus subsidies. Imputed rental value of owner-occupied manufactured homes: Product of rent per unit of tenant-occupied units and the ratio of the average number of rooms in owner-occupied units to those in tenant-occupied units based on COH data. Expenses: Aggregate of unpublished measures: (1) Contract site rent: Historical value extrapolated by the rate of change in gross rent from COH. (2) Mortgage interest paid: Mortgage debt outstanding extrapolated using growth rate in sales of manufactured homes from Census Bureau Manufactured Housing Survey; effective rate of interest extrapolated using growth rate in FRB blended rate for manufactured homes. (3) Property taxes: 2001 RFS-based value extrapolated using growth rate in rental value of owner- and tenant-occupied manufactured homes. (3) Consumption of fixed capital: BEA's Fixed Asset	Imputed rental value of owner-occupied nonfarm housing, less expenses and plus subsidies. Imputed rental value: Extrapolated based on median rent from AHS or on CPI for owners' equivalent rent of primary residence. Expenses: Aggregate of unpublished measures:. (1) Contract site rent: same as benchmark year. (2) Mortgage interest paid: same as benchmark year. (3) Property taxes: same as benchmark year. (4) Consumption of fixed capital: same as benchmark year. (5) Miscellaneous costs: extrapolated using the growth rate in the rental value of owner-occupied manufactured homes less contract site rent.	Imputed rental value: For unit stocks, new shipments of manufactured homes from Census Bureau. For average rent, CPI for owners' equivalent rent of primary residence. Expenses: Judgmental trend.

Table 12.A—Summary of Methodology Used to Prepare Rental Income of Persons				
Line in NIPA table 7.9	**Component**	**Benchmark year**	**Nonbenchmark year**	**Current quarterly estimates**
			Indicator series used to interpolate and extrapolate*	
		Accounts. (4) Miscellaneous costs: BEA's Input-Output Accounts.		
13	Farm owner-occupied housing owned by farm operators	Same as farm tenant-occupied farm housing.	Same as farm tenant-occupied farm housing.	Same as farm tenant-occupied farm housing.
14	Tenant-occupied housing owned by nonprofit institutions	Allocated portion of rental value of tenant-occupied housing less allocated portion of expenses and plus allocated portion of subsidies.	Same as benchmark year.	Judgmental trend.

* The description “Same as for benchmark year” indicates that the estimate is prepared using a methodology similar to that used for the benchmark estimate rather than by using an indicator series to interpolate or extrapolate the benchmark estimate.

AHS: American Housing Survey, Census Bureau
AHS: American Housing Survey, Census Bureau
BLS: Bureau of Labor Statistics
COH: Decennial Census of Housing--average rent for tenant occupied
CPI: Consumer Price Index, Census Bureau
FRB: Federal Reserve Board

FHFA: Federal Housing Finance Agency
I-O: Input-Output

IRS: Internal Revenue Service
RFS: Decennial Census of Housing, Residential Finance Survey—discontinued in 2001

CHAPTER 13: CORPORATE PROFITS

(Updated: December 2020)

Definitions and Concepts
Recording in the NIPAs
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    Annual (except most-recent-year) estimates
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    Current quarterly estimates
Table 13.A—Summary of Methodology for Corporate Profits
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Appendix: Domestic Gross Corporate Value Added and Related Measures

Corporate profits represents the portion of the total income earned from current production that is accounted for by U.S. corporations. The estimates of corporate profits are an integral part of the national income and product accounts (NIPAs), a set of accounts prepared by the Bureau of Economic Analysis (BEA) that provides a logical and consistent framework for presenting statistics on U.S. economic activity (see "Chapter 2: Fundamental Concepts").

Corporate profits is one of the most closely watched U.S. economic indicators. Profitability provides a summary measure of corporate financial health and thus serves as an essential indicator of economic performance. Profits are a source of retained earnings, providing much of the funding for capital investments that raise productive capacity. The estimates of profits and of related measures may also be used to evaluate the effects on corporations of changes in policy or in economic conditions.

Profits are also frequently used in measuring the rate of return on investment and the relationship between earnings and equity valuation. For example, the estimates of corporate profits before and after tax, along with estimates of corporate net value added, are used in preparing BEA's annual measures of aggregate rates of returns for domestic nonfinancial corporations.[1]

BEA's featured measure of corporate profits—profits from current production—provides a comprehensive and consistent economic measure of the income earned by all U.S. corporations. As such, it is unaffected by changes in tax laws, and it is adjusted for nonreported and misreported income. It excludes dividend income, capital gains and losses, and other financial flows and adjustments, such as deduction for "bad debt." Thus, the NIPA measure of profits is a particularly useful analytical measure of the health of the corporate sector. For example, in contrast to other popular measures of corporate

[1] See Sarah Osborne and Bonnie A. Retus, "Returns for Domestic Nonfinancial Business," *Survey of Current Business* 98 (December 2018).

profits, the NIPA measure did not show the large run-up in profits during the late 1990s that was primarily attributable to capital gains.

In addition, BEA prepares associated measures of payments arising from corporate profits, including taxes and dividends. Taxes on corporate income consists of taxes on income paid to government and to the rest of the world. Corporate taxes are an important source of funding for federal and for state and local government operations. Net dividend payments consists of payments to shareholders by U.S. corporations. Corporate dividends paid to shareholders measures investment returns to them in the form of current income, including dividends paid to persons as a component of the NIPA measure of personal income.

Definitions and Concepts

Corporate profits measures the income, before deducting income taxes, of organizations treated as corporations in the NIPAs. These organizations consist of all entities required to file federal corporate tax returns, including mutual financial institutions and cooperatives subject to federal income tax; nonprofit organizations that primarily serve business; Federal Reserve banks; and federally sponsored credit agencies. Reflecting the concepts of national economic accounting, income in the NIPAs is defined as that arising from current production. This income is measured as receipts less expenses as defined in federal tax law, but with several important differences.[2]

Table 13.1 shows the types of transactions that are included in, and excluded from, corporate profits.

Table 13.1—Content of Corporate Profits

Category of transaction	Comments
Corporate profits before tax	Includes all U.S. corporations, including private corporations and S corporations. Includes other organizations that do not file federal corporate tax returns—such as certain mutual financial institutions and cooperatives, nonprofits that primarily serve business, Federal Reserve banks, and federally sponsored credit agencies. Receipts exclude gains, net of losses, from the sale of property. Receipts exclude dividends received. Expenses include distributions to shareholders of regulated investment companies that represent interest income, which are classified as interest payments in the NIPAs.

[2] The NIPA measures of corporate profits are closely related to the measures for corporations in the System of National Accounts (SNA). However, the SNA definition has a broader definition of the corporate sector that includes most federal government and state and local government enterprises and private entities such as limited liability partnerships and nonprofit institutions that are primarily engaged in market production. (See Stephanie H. McCulla, Karin E. Moses, and Brent R. Moulton, "The National Income and Product Accounts and the *System of National Accounts 2008:* Comparison and Research Plans," *Survey* 95 (June 2015): 1-17.)

	Excludes the cost of trading and issuing corporate securities. Expenses exclude deductions for bad debt, depletion, and state and local taxes on corporate income. Expenses exclude expensing for, and include depreciation of, intangible amortization, mining exploration, shafts, and wells, and intellectual property products.
Inventory valuation adjustment	Inventory withdrawals are valued at current cost.
Capital consumption adjustment	Depreciation is valued at current cost.

Most businesses report profits on both a financial-accounting basis and a tax-accounting basis.[3] Both financial accounting and tax accounting calculate profits as the difference between receipts and expenses; however, they differ in the definitions of some receipts and expenses, in the timing of when the receipts and expenses are recorded, and in the purposes for which the information is prepared. Financial-accounting measures, which reflect "generally accepted accounting principles," underlie the reports to stockholders, to lenders, and to government regulatory agencies; tax-accounting measures underlie corporate income tax returns. The Internal Revenue Service (IRS) has tabulated an information return (the M-3) that reconciles various items (such as employee stock options) reported on financial reports with the same items reported on most corporate tax returns, beginning with 2005. The annual and quarterly financial reports prepared by individual companies provide the basis for another widely followed set of indicators of corporate profits—the Standard and Poor's (S&P) 500 measures of reported earnings, operating earnings, and earnings per share, which reflect the aggregate earnings of the 500 corporations that compose the S&P stock index.[4]

When available, BEA uses data collected on a tax-accounting basis as the primary source of information on corporate profits. These data are based on well-specified, consistent accounting definitions that, in general, more closely parallel NIPA concepts and definitions. For example, in financial accounting, corporations sometimes record the value of extraordinary losses before they actually incur the expenses associated with the losses. Financial accounting also allows some flexibility in the way definitions are applied by corporations—for example, in the selection of service lives and in the valuation of liabilities. In addition, the tax-accounting tabulations are comprehensive, covering all incorporated businesses—both publicly traded and privately held—and all industries, while financial-accounting tabulations cover a subset of the corporate universe. However, financial-accounting information is more timely than the tax-return data, so it is used by BEA to derive the estimates for the most recent year and for the current quarters. Neither set of accounting data is entirely suitable for implementing the NIPA concept of profits from current production. Consequently, BEA's procedure for

[3] For a general discussion of the NIPA accounting framework and of the underlying accounting principles, see the section "Accounting Framework," in chapter 2. For an in-depth discussion, see "An Introduction to National Economic Accounting," Methodology Paper No. 1, September 2007 on BEA's website at www.bea.gov.

[4] The NIPA and S&P measures of profits differ significantly in purpose, coverage, source data, definitions, and methodologies; see Andrew W. Hodge, "BEA Briefing: Comparing NIPA Profits With S&P 500 Profits," *Survey* 91 (March 2011): 22–27.

estimating NIPA corporate profits mainly consists of adjusting, incorporating, and supplementing these data.[5]

Profits from current production, the featured measure of corporate profits in the NIPAs, is derived as the sum of profits before tax (PBT) and of two adjustments—the inventory valuation adjustment (IVA) and the capital consumption adjustment (CCAdj).

PBT—sometimes referred to as "book profits"—reflects corporate income regardless of any redistribution of income made through taxes. The PBT estimates are primarily based on tax-return information provided by the IRS in *Statistics of Income: Corporation Income Tax Returns*, which is then adjusted to conform to BEA coverage and definitions.[6] PBT is distributed to government as taxes on corporate income and to shareholders in other sectors as dividends or is retained as undistributed profits. The estimates of PBT are prior to the IVA and CCAdj (which are discussed in the following two paragraphs), so PBT reflects the charges used in business tax accounting for inventory withdrawals and for depreciation.

As prices change, businesses that value inventory withdrawals at original acquisition (historical) costs may realize inventory profits or losses. In the NIPAs, these gains or losses that result from holding goods in inventory are not considered income from current production and thus are removed from business income. The IVA converts the business-accounting valuation of withdrawals from inventory, which is based on a mixture of historical and current costs, to a current-cost basis by removing the capital-gain-like or the capital-loss-like element that results from valuing these withdrawals at prices of earlier periods.[7]

Depreciation measured on a business-accounting basis must be adjusted to reflect consistent economic-accounting measures that are valued at current-replacement cost. The CCAdj is a two-part adjustment that (1) converts valuations of depreciation that are based on a mixture of service lives and depreciation patterns specified in the tax code to valuations that are based on uniform service lives and empirically based depreciation patterns; and (2) like the IVA, converts the measures of depreciation to a current-cost basis by removing from profits the capital-gain-like or capital-loss-like element that arises from valuing the depreciation of fixed assets at the prices of earlier periods.[8]

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[5] See the section "Overview of Source Data and Estimating Procedures." In addition, for an in-depth discussion of estimation issues regarding corporate profits, see Dylan G. Rassier, "The Role of Profits and Income in the National Accounts," *Survey* 91 (February 2012): 8–22.

[6] For more information, see "Business Tax Statistics, Corporations," at www.irs.gov/uac/Tax-Stats-2.

[7] For more information, see "Chapter 7: Change in Private Inventories," 7–4.

[8] After the September 11, 2001, attacks on the World Trade Center and the Pentagon and the subsequent perceived weakness in the economy, legislation was passed to stimulate business investment by temporarily modifying tax-based depreciation rules. As part of the Job Creation and Worker Assistance Act of 2002, businesses were permitted to depreciate a "bonus" amount during the first year, over and above that allowed under traditional tax accounting rules. Because total depreciation cannot exceed the amount of the investment, the amount of depreciation remaining to be taken in future years was reduced. Hence, depreciation was raised during the "bonus" span and lowered thereafter, and because depreciation is an expense in calculating profits, PBT was understated during the "bonus" span and overstated thereafter. A

The composition of profits from current production—that is, corporate profits with IVA, and CCAdj—is illustrated below.

	2015 estimate (billions of dollars)
Corporate profits with IVA and CCAdj	2,060.5
PBT	2,128.3
IVA	56.3
CCAdj	-124.1
For consistent accounting at historical cost	1,464.1
For current-cost valuation	-1,588.2

The NIPAs include tabulations for both "national" profits and "domestic" profits.[9] The profits component of national income includes "profits originating in the rest of the world." This measure is calculated as receipts by all U.S. residents, including both corporations and persons, of dividends from foreign corporations, and, for U.S. corporations, their share of the reinvested earnings of their incorporated foreign affiliates, and the earnings of unincorporated foreign affiliates, net of corresponding payments. The profits component of domestic income excludes the income earned abroad by U.S. corporations and includes the income earned in the United States by foreign-owned corporations. These relationships are illustrated below.

	2015 estimate (billions of dollars)
Corporate profits with IVA and CCAdj	2,060.5
Less: Rest of the world	395.2
Receipts from the rest of the world	670.1
Less: Payments to the rest of the world	274.9
Corporate profits with IVA and CCAdj, domestic industries	1,665.3

number of subsequent economic stimulus acts also included provisions for "bonus" depreciation; therefore, the effects of tax acts of later years are net of offsetting bonus depreciation that was claimed in previous years.

Profits from current production (PBT with IVA and CCAdj) was not affected by the acts, because it does not depend on the depreciation-accounting practices used for federal income tax purposes; instead, this measure of profits is based on an estimate of the value of fixed capital actually used up in the production process. However, because the acts reduced tax liability, profits from current production on an after-tax basis was adjusted by the net effect of the tax acts. Because the acts affect tax depreciation, the CCAdj was also adjusted by the same amount. BEA estimates of the adjustment are based on data from the Office of Tax Analysis (OTA) of the U.S. Department of Treasury and on other source data (for more information, see OTA's working paper "Corporate Response To Accelerated Tax Depreciation: Bonus Depreciation For Tax Years 2002-2004").

[9] For a general discussion of domestic and national measures in the NIPAs, see the section "Geographic coverage" in chapter 2.

Other principal profits measures that are presented in the NIPAs (see NIPA table 1.12) are defined as follows:

Taxes on corporate income consists of taxes paid on corporate earnings to federal, state, and local governments and to foreign governments. These earnings include capital gains and other income excluded from PBT. The taxes are measured on an accrual basis, net of applicable tax credits.

Profits after tax with IVA and CCAdj is equal to corporate profits with IVA and CCAdj less taxes on corporate income. It provides an after-tax measure of profits from current production.

Net dividends consists of payments in cash or other assets, excluding the corporation's own stock, made by corporations located in the United States and abroad to stockholders who are U.S. residents. The payments are netted against dividends received by U.S. corporations, thereby providing a measure of the dividends paid by U.S. corporations to other sectors.

Undistributed corporate profits with IVA and CCAdj is equal to corporate profits with IVA and CCAdj less taxes on corporate income and less net dividends. It measures corporate saving from profits.

Net cash flow with IVA is equal to undistributed corporate profits with IVA and CCAdj plus consumption of corporate fixed capital less capital transfers paid (net). It is a profits-related measure of internal funds available for investment.

Consumption of fixed capital (CFC) is the economic charge for the use of fixed capital. It is defined as the decline in the value of the stock of assets due to wear and tear, obsolescence, aging, and accidental damage except that caused by a catastrophic event.[10]

Capital transfers paid (net) is the net measure of unrequited transfers associated with the acquisition or disposal of assets between the corporate sector and other sectors.

Corporate profits with IVA is defined in the same way as corporate profits with IVA and CCAdj, except corporate profits with IVA reflects the depreciation-accounting practices used for federal income tax returns. Profits by industry is shown on this basis because estimates of the CCAdj by industry are not available.

[10] In the 2009 comprehensive update, BEA introduced a new treatment of major disasters (those in which either the associated property losses or the insurance payouts exceed 0.1 percent of GDP) that records them as "changes in the volume of assets" rather than as CFC; see Eugene P. Seskin and Shelly Smith, "Preview of the 2009 Comprehensive Revision of the NIPAs: Changes in Definitions and Presentations," *Survey* 89 (March 2009): 11–15.

Profits after tax without IVA and CCAdj is equal to PBT less taxes on corporate income. It consists of net dividends and undistributed corporate profits. This measure is often used in comparisons with the S&P measures of reported earnings.

Undistributed corporate profits without IVA and CCAdj is equal to PBT less taxes on corporate income and less net dividends. It measures corporate saving from book profits.

In addition, BEA prepares estimates of *gross corporate value added* (see NIPA table 1.14), which is defined as the total value of all goods and services produced by the corporate sector (gross output) less the value of those goods and services that are used up in production (total intermediate inputs). For a discussion of the derivation of gross corporate value added and of related measures, see the appendix to this chapter.

Recording in the NIPAs

As described in chapter 2, the NIPAs can be viewed as aggregations of accounts belonging to individual transactors in the economy. In the seven summary accounts of the NIPAs, corporate profits with IVA and CCAdj appears in the Private Enterprise Account (account 2), and undistributed corporate profits with IVA and CCAdj appears in the Domestic Capital Account (account 6). Taxes on corporate income appears in the Private Enterprise Account, the Government Receipts and Expenditures Account (account 4), and the Foreign Transactions Current Account (account 5). Corporate dividends appears in the Private Enterprise Income Account, the Personal Income and Outlay Account (account 3), the Government Receipts and Expenditures Account, and the Foreign Transactions Current Account.

The NIPAs include a substantial number of tables that present aggregate and detailed current-dollar estimates of corporate profits. In most of the NIPA tables, the totals are shown on a national basis. In tables showing industry detail, profits on a national basis are shown as the total of profits for domestic industries and for the "rest-of-the-world" industry. The NIPA tables that present estimates of seasonally adjusted and not seasonally adjusted corporate profits are identified in table 13.2 below.

Table 13.2--Measures of Corporate Profits in NIPA Tables

Profits measures	National total	Rest of the world	Domestic			
			Total		Financial[2]	Nonfinancial
			Aggregate	Industry detail		
Current production measures:						
Corporate profits with IVA & CCAdj	1.7.5, 1.12, 1.16, 6.16	NA	1.10, 1.13, 1.14, 8.2	NA	NA	1.14
Less: Taxes on corporate income[3]	1.10, 1.12, 1.16, 3.1, 6.18, 7.16	6.18	1.10, 1.14, 6.18, 8.2	6.18	NA	1.14
Equals: Profits after tax with IVA & CCAdj	1.12, 1.16	NA	1.10, 1.14	NA	NA	1.14
Less: Net dividends[4]	1.12, 1.16, 6.20, 7.10, 7.16	6.20, 7.10, 7.16	1.10, 1.14, 7.10, 8.2	6.20	7.10	1.14, 7.10
Dividends paid	7.10	1.16, 4.1, 7.10	7.10	NA	7.10	7.10
Less: Dividends received	7.10	1.16, 4.1, 7.10	7.10	NA	7.10	7.10
Equals: Undistributed profits with IVA & CCAdj	1.12, 1.16, 5.1	NA	1.10, 1.14, 8.2.	NA	NA	1.14
Plus: Consumption of fixed capital	1.12, 7.5	NA	1.14, 7.5	NA	7.5	7.5, 1.14
Less: Capital transfers paid (net)	5.11, 1.12	NA	NA	NA	NA	NA
Equals: Net cash flow with IVA	1.12	NA	NA	NA	NA	NA
Derivation from "book profits":						
Profits before tax (PBT) or "book profits"	1.12, 6.17, 7.16	1.13, 6.17	1.14, 6.17	6.17	NA	1.14
Plus: IVA	1.12, 5.1, 6.14	NA	1.14, 6.14	6.14	NA	1.14
Equals: Corporate profits with IVA	1.12, 6.16	6.16	6.16	6.16	6.16	6.16
Plus: CCAdj	1.12, 1.13, 5.1, 7.13	NA	1.14, 7.6	NA	7.6	1.14, 7.6
Equals: Corporate profits with IVA & CCAdj						
Other "book" measures:						
Profits after tax	1.12, 6.19, 7.16	6.19	1.14, 6.19	6.19	NA	1.14
Undistributed profits	1.12, 6.21, 5.1	6.21	6.21	6.21	NA	NA

NA Not available
CCAdj Capital consumption adjustment
IVA Inventory valuation adjustment
NIPA National income and product accounts

1. Financial corporations consist of finance and insurance and of banks and other holding companies.
2. Federal taxes on corporate income are shown in "Selected" table 3.2; seasonally unadjusted quarterly estimates appear in table 3.22 annually. State and local taxes on corporate income are shown in "Selected" table 3.3; seasonally unadjusted quarterly estimates appear in table 3.23 annually. State taxes on corporate income are shown in table 3.20 annually; local taxes on corporate income are shown in table 3.21 annually.
3. Personal dividend income, a component of personal income, is shown in NIPA tables 2.1, 2.6, and 7.10.

In addition, estimates of gross corporate value added and of real gross corporate value added for nonfinancial domestic corporate business are presented in NIPA table 1.14, and estimates of price, costs, and profit per unit of real gross value added of nonfinancial domestic corporate business are presented in NIPA table 1.15. For a description of these estimates, see the appendix to this chapter.

Overview of Source Data and Estimating Procedures

As described earlier in the handbook, the NIPA estimates, including those for corporate profits, are prepared using a wide variety of source data (see "Chapter 3: Principal Source Data") and using estimating methods that adjust the source data to the required NIPA concepts and that fill in gaps in coverage and timing (see "Chapter 4: Estimating Methods"). As discussed earlier in the chapter, corporate profits from current production is derived as the sum of PBT, IVA, and CCAdj. The primary source for the PBT estimates is tax return information provided by the IRS in *Statistics of Income: Corporation Income Tax Returns (Corporation Returns)*; BEA makes a series of adjustments to these data to conform them to NIPA coverage and definitions. BEA then adjusts the PBT estimate with the IVA and the CCAdj in order to derive an estimate of income earned from current production that is consistent with NIPA concepts.

This section describes the sources and methods used for estimating PBT and for estimating the distributions of PBT.[11] Payments from PBT to government as taxes on corporate income and to shareholders in other sectors as dividends are estimated independently and are discussed below. Undistributed profits—that is, profits that are retained by corporations—are derived by subtracting taxes on corporate income and net dividends from PBT.

Table 13.A at the end of the main text summarizes the source data and estimating methods that are used to prepare the annual estimates and the current quarterly estimates of corporate profits for the industry categories shown in NIPA table 6.16. The source data and methods for the current quarterly estimates reflect both seasonally adjusted and not seasonally adjusted estimates unless otherwise noted.

Annual (except most-recent-year) estimates

For all but the most recent year, the annual estimates of PBT, taxes on corporate income, and net dividends for domestic industries are based primarily on annual tabulations of corporate income tax returns. The annual estimates of PBT and of net dividends for the rest of the world are from BEA's international transactions accounts (ITAs).[12]

The tabulations of corporate income tax returns are prepared by the IRS and published in *Statistics of Income: Corporation Income Tax Returns*. The tabulations are based on a stratified sample of unaudited tax returns that currently includes all active corporations with more than $50 million of assets (with certain exceptions) and smaller firms on a probability basis. The information on the returns is edited by the IRS in the course of preparing the tabulations. The tabulations provide the basis for estimates for the

[11] For information on the derivation of the estimates of the IVA and the CCAdj, see "Chapter 7: Change in Private Inventories," and see U.S. Bureau of Economic Analysis, *Fixed Assets and Consumer Durable Goods in the United States, 1925–97,* September 2003.
[12] For a detailed description of the ITA's, see "U.S. International Transactions Accounts: Concepts and Methods" (June 2014) on BEA's website at www.bea.gov.

corporate totals—by industry—for many of the items on the corporate income tax returns, including receipts and expenses, tax liabilities, and balance-sheet items.

The IRS totals are the starting point for preparing the NIPA estimates. The preliminary and final IRS tabulations become available about 2 years and 3 years, respectively, after the year to which they refer, and this timing determines the incorporation of these data into the NIPA estimates. For example, in the July 2018 annual update of the NIPAs, the final IRS tabulations for 2015 became the primary source for the estimates of corporate profits for 2015 (replacing the preliminary tabulations as the source), and the preliminary IRS tabulations for 2016 became the primary source for the profits estimates for 2016. The estimates for the most recent year, 2017, were obtained by extrapolating the 2016 estimates (see the section "Most-recent-year estimates").

The adjustments that BEA makes to the IRS tabulations are summarized in the following section, and they are described in detail in the technical note to this chapter.

Adjustments to the IRS tax return data

As discussed, the IRS corporate tax return data are the primary source for BEA's estimates of corporate profits. A reconciliation of the IRS and the NIPA measures is presented annually in NIPA table 7.16, which is reproduced for the year 2015 in table 13.3 below.

Table 13.3—Relation of NIPA Corporate Profits, Taxes, and Dividends to Corresponding Measures as Published by the IRS
[Billions of dollars]

Line in NIPA table 7.16	NIPA line item	2015
1	**Total receipts less total deductions, IRS**	1,927.5
2	Plus: Adjustment for misreporting on income tax returns	367.3
3	Posttabulation amendments and revisions [1]	66.5
4	Income of organizations not filing corporation income tax returns	117.1
5	Federal Reserve banks	101.2
6	Federally sponsored credit agencies [2]	7.9
7	Other [3]	7.9
8	Depletion on domestic minerals	20.1
9	Adjustment to depreciate expenditures for mining exploration, shafts, and wells	23.9
10	State and local taxes on corporate income	56.2
11	Interest payments of regulated investment companies	-156.2
12	Bad debt expense	123.9
13	Adjustment to depreciate expenditures for intellectual property products[4]	96.1
14	Disaster adjustments (net) [5]	0.0
	Less: Tax return measures of:	
15	Gains, net of losses, from sale of property	297.8
16	Dividends received from domestic corporations	294.1
17	Income on equities in foreign corporations and branches (to U.S. corporations)	261.0
18	Costs of trading or issuing corporate securities [6]	55.1
19	Excess of employer expenses over actual employer contributions for defined benefit employee pension plans[7]	1.4
20	Plus: Income received from equities in foreign corporations and branches (by all U.S. residents, net of corresponding payments)	395.2
21	**Equals: Profits before taxes, NIPAs**	2,128.3
22	**Federal income and excess profits taxes, IRS**	481.2
23	Plus: Posttabulation amendments and revisions, including results of audit and renegotiation and carryback refunds	-0.5
24	State and local taxes on corporate income	56.2
25	Taxes paid by domestic corporations to foreign governments on income earned abroad	10.9
26	Less: U.S. tax credits claimed for foreign taxes paid	110.2
27	Investment tax credit [8]	
28	Other tax credits [8]	41.4
29	**Equals: Taxes on corporate income, NIPAs**	396.3
30	**Profits after tax, NIPAs (line 21 minus line 29)**	1,732.0
31	**Dividends paid in cash or assets, IRS**	1,870.1
32	Plus: Posttabulation adjustments and revisions [9]	-411.4
33	Dividends paid by Federal Reserve banks and certain federally sponsored credit agencies [2]	114.9
34	U.S. receipts of dividends from abroad, net of payments to abroad	162.8
35	Earnings remitted to foreign residents from their unincorporated U.S. affiliates	9.5
36	Interest payments of regulated investment companies	-156.2
37	Less: Dividends received by U.S. corporations	420.1
38	Earnings of U.S. residents remitted by their unincorporated foreign affiliates	4.7
39	**Equals: Net corporate divided payments, NIPAs**	1,164.9

1. Consists largely of an adjustment to expense all meals and entertainment, of oilwell bonus payments written off, of adjustments for insurance companies and savings and loan associations, of amortization of intangible assets, residential real estate disposal costs, and of tax-exempt interest income.

2. Consists of the Farm Credit System and the Federal Home Loan Banks and amounts paid to U.S. Treasury by Federal Reserve banks.
3. Consists of nonprofit organizations serving business and of credit unions.
4. Intellectual property products consists of software, research and development, and entertainment, literary, and artistic originals.
5. Consists of disaster losses valued at historic-cost basis less net insurance receipts for disaster-related losses valued at replacement cost.
6. Includes the imputed financial service charge paid by corporations to domestic securities dealers who do not charge an explicit commission.
7. Employer expenses for defined benefit employee pension plans include actual employer contributions, imputed employer contributions, and imputed interest for unfunded (or overfunded) actuarial liability.
8. Beginning with 1984, the investment tax credit is included in other tax credits (line 28).
9. Consists largely of an adjustment to remove capital gains distributions of regulated investment companies.

The major adjustments to IRS "total receipts less total deductions" (line 1) required to arrive at PBT for domestic industries consist of the following:

- An allowance for the misreporting of corporate income (line 2), based on IRS audit data;
- IRS deductions that are not elements of costs of current production: depletion on domestic minerals (line 8), expensing of expenditures for mining exploration, shafts, and wells (line 9), state and local taxes on corporate income (line 10), bad debt expense (line 12), and the adjustment to depreciate expenditures for intellectual property products (line 13);
- Elements of costs of production that are not IRS current deductions: interest payments of regulated investment companies (line 11), net disaster adjustments (line 14), and costs of trading or issuing corporate securities (line 18).
- Elements of IRS income that are not income from current domestic production: gains, net of losses, from the sale of property (line 15), dividends received from domestic corporations (line 16), and income on equities in foreign corporations and branches (line 17).
- The excess of employer expenses over actual employer contributions for defined benefit employee pension plans, based on data from the Employee Benefit Security Administration, the Pension Benefit Guarantee Corporation, the Social Security Administration, and the American Council of Life Insurance (line19).

To arrive at PBT on a national basis, rest-of-the-world profits, derived from the ITAs, is added (line 20).

The adjustments to IRS "federal income and excess profits taxes" (line 22) that are required to arrive at NIPA taxes on corporate income consist of the following:

- Tax liability disclosed by audit, renegotiation, and carryback refunds (part of line 23);[13]

[13] "Carryback refunds" are refunds claimed by corporations with losses in the current year against taxes that they had paid in preceding years.

- Elements of NIPA taxes on corporate income that are not included in IRS federal income and excess profits taxes: state and local taxes on corporate income (line 24);
- Taxes paid by domestic corporations to foreign governments on income earned abroad (nonresident taxes) (line 25);
- IRS tax credits deducted in arriving at NIPA taxes on corporate income: foreign tax credits (line 26), investment tax credit (line 27), and other tax credits (line 28).

The adjustments to IRS "dividends paid in cash or assets" (line 31) required to arrive at NIPA dividends consist of the following:

- Posttabulation amendments and revisions (line 32);
- Elements of NIPA dividends not included in IRS dividends paid in cash or assets: dividends paid by Federal Reserve banks and other federally sponsored credit agencies (line 33) and measures of U.S. receipts of dividends from the rest of the world net of payments to the rest of the world (lines 34, 35, and 38);
- Elements of IRS dividends paid in cash or assets that are not included in NIPA dividends: capital gains distributions of regulated investment companies (part of line 32), interest payments of regulated investment companies (line 36), and dividends received by U.S. corporations (line 39).

NIPA dividends shown as net corporate dividend payments are found on line 39. This net number accounts for dividend payments made to persons and to government (also shown on line 18 of NIPA table 7.10, which shows a breakdown of dividends paid and received by sector). Dividends payments made to government (federal plus state and local governments on line 13 of table 7.10) are subtracted from total net corporate dividend payments to arrive at personal dividend income (line 21 of table 7.10).[14]

Most-recent-year estimates

Profits before tax

For PBT, the estimates for the most recent year are prepared by extrapolating the estimates for the preceding year (for a general description of the extrapolation method, see "Interpolation and extrapolation using an indicator series" in chapter 4). The extrapolations are carried out separately for each of about 75 industries using indicators that are based on a variety of source data. Two of the principal sources are the Census Bureau's *Quarterly Financial Report* and BEA tabulations of samples of shareholder reports.

[14] For more information on the derivation of dividend payments received by state and local governments, see the NIPA methodology paper "paper "Government Transactions" (September 2005) on BEA's website at www.bea.gov.

The *Quarterly Financial Report* is the source for the indicators for the following industries: mining; manufacturing; wholesale trade; retail trade; information; and professional, scientific, and technical services, except legal services. The indicators are based on tabulations of corporate income statements collected and published quarterly by the Census Bureau. They are derived by taking the *Quarterly Financial Report* measure "income (loss) before taxes" and subtracting the following items where possible: (1) dividend income, (2) nonrecurring items, including gain (loss) on sale of assets, restructuring costs, and asset write-downs, and (3) net income (loss) of foreign branches and equity in earnings (losses) of nonconsolidated subsidiaries, net of foreign taxes.

Aggregated shareholder reports are the source for the indicators for *all* of the components of the following industries: construction; administrative and waste management services; educational services; health care and social assistance; arts, entertainment, and recreation; and other services, except government. In addition, they are the source for the indicators for *most* of the components of the following industries: utilities; transportation and warehousing; finance and insurance; and real estate and rental and leasing. The indicators are based on income from samples of shareholder reports, including data drawn from S&P's Compustat database for all public U.S. corporations that have reported data for the current and the prior year. For each industry, the indicator used is "pre-tax income" less "special charges" (unusual or nonrecurring items reported by the company before the deduction of taxes). In addition to the removal of special charges, BEA judgmentally removes certain other non-operating charges, such as unrealized mark-to-market gains or losses, asset write-downs, and other valuation gains or losses.

For some financial industries, the indicators are based on information from reports filed with various government regulatory agencies, such as *Call Reports* with the Federal Financial Institutions Examination Council, and from the annual reports of the various financial institutions. The indicators for the few remaining domestic industries are based on judgmental trends. For the rest-of-the-world industry, the estimates are from the ITAs. (For more information, see table 13.A.)

Taxes on corporate income

For the two tax series for which the annual estimates are not based on IRS tabulations of corporate income tax returns—nonresident taxes and state and local taxes on corporate income—the estimates for the most recent year are prepared using the same methods as those used for the preceding year (see the technical note to this chapter, table 13.8, lines 24–26).

For federal taxes, the estimates of the carryback refunds adjustment for the most recent year are prepared using the same methods as those for the preceding annual estimates, while the audit tax adjustment is a judgmental estimate (see the technical note, table 13.8, line 23). For federal taxes (net of tax credits), the estimates for each industry are prepared by extrapolation, using indicators that are based on the same sources as those used for the PBT estimates. The industry estimates are summed and then forced to

match a control total by absorbing proportionate shares of the difference. The control total is primarily based on data on tax collections from the *Monthly Treasury Statement*, separated by liability year using information from the Department of the Treasury's Office of Tax Analysis.

Net dividends

Estimates for the most recent year are extrapolated, using indicators that are based on the same sources as those used for the PBT estimates. For dividends received by U.S. corporations from abroad, the IRS-based estimates are extrapolated using dividends paid by foreign corporations from the ITAs. For regulated investment companies, the estimates are extrapolated based on data from the Investment Company Institute. For Federal Reserve banks and for federally sponsored credit agencies, the estimates for dividends are prepared using the same methods as those used for the preceding year (see the technical note, table 13.9, line 34). As with the preceding annual estimates, total net corporate dividends less dividend payments made to government yields personal dividend income.

Current quarterly estimates

The seasonally adjusted current quarterly estimates of PBT are derived by extrapolating the most-recent-year estimates (for an explanation of this method, see "Interpolation and extrapolation using an indicator series" in chapter 4). The industry indicators used for the quarterly extrapolations are generally based on the same (seasonally adjusted) source data as those used for the most-recent-year estimates (see table 13.A).

Not seasonally adjusted estimates of PBT are derived using the same methods as the seasonally adjusted estimates, using not seasonally adjusted versions of the same indicators.

For nonresident taxes, the current quarterly estimates are prepared using the same methods as those used for the annual estimates. Seasonally adjusted (SA) estimates of other federal taxes are estimated by industry by dividing the SA PBT estimates by the implicit quarterly tax rate from the most recent year and judgmentally adjusting for outliers. This technique is based on the assumption that tax laws have not changed much from the previous year; if tax laws change appreciably, further judgmental adjustments are made. For state and local taxes, the estimates are based on tax collections data and on a timing factor that, in turn, is a function of the quarter-to-quarter change in NIPA profits before tax and the average tax rate.[15] Not seasonally adjusted (NSA) tax rates are calculated in the same manner as SA tax rates; the SA PBT estimates are divided by the implicit quarterly tax rate from the most recent year and judgmentally adjusting for outliers.

[15] See Eugene P. Seskin and Alyssa E. Holdren, "Annual Revision of the National Income and Product Accounts," *Survey* 92 (August 2012): 25.

Quarterly estimates of gross flows of domestic corporate dividends paid and received are not prepared. Therefore, the current quarterly estimate of net national dividends is derived as a residual in the calculation of the current quarterly personal dividends.

For the first, second, and third quarters of the calendar year, preliminary quarterly estimates of PBT, taxes on corporate income, and net dividends are released approximately 55 days after the end of the quarter (along with the "second" estimates of GDP), and revised quarterly estimates are released approximately 85 days after the end of the quarter (along with the "third" estimates of GDP). In general, the preliminary quarterly estimates are based on less complete information than the revised estimates. For example, for industries extrapolated with information from the *Quarterly Financial Report*, the preliminary estimates are based on a subsample of the information that becomes available a month later. For the fourth quarter of the year, preliminary estimates are not prepared, and the only current estimates for that quarter are released approximately 85 days after the end of the quarter. This delay occurs because the fiscal year for most corporations ends in the fourth quarter, and additional time is needed to complete the more comprehensive end-of-year reports.

As part of the calculation of dividends received by persons, an estimate of net *national* dividends paid by corporations becomes available on the same schedule as the estimates of GDP, approximately 25 days, 55 days, and 85 days after the end of the quarter. In a reversal of the accounting identities used for preparing the annual estimates of dividends, personal dividends received are estimated first. Monthly estimates of SA personal dividends are prepared using as an indicator the seasonally adjusted dividends paid based on a Compustat sample. The monthly estimates are averaged to derive quarterly estimates of personal dividends received, which are then added to dividends received by government to derive net national dividends. Rest-of-the-world dividends (net) are subtracted to derive net domestic dividends, which are then split into financial and nonfinancial sectors using data from the Compustat sample. NSA personal dividends are derived using an NSA indicator based on a Compustat sample.

Table 13.A—Summary of Methodology Used to Prepare Estimates of Corporate Profits				
Line in NIPA table 6.16	Component	Annual (except most-recent-year) estimates	Most-recent-year estimates* (Indicator series used to extrapolate prior annual estimate)	Current quarterly estimates (Indicator series used to extrapolate most-recent-year estimate) *
1	**Corporate profits with inventory valuation adjustment (IVA) and capital consumption adjustment:**			
8	**Corporate profits with IVA:**			
9	**Domestic industries:**			
10	Financial:			
11	Federal Reserve banks	Net income before tax—current net earnings less assessments for the Board of Governors and currency costs—from the annual report of the Board of Governors of the Federal Reserve System.	Same as for annual.	Profits before tax, based on information from the Federal Reserve Board.
12	Other financial:			
	Credit intermediation and related activities	Commercial banking, savings institutions, and other depository credit intermediation: receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences. Credit unions: net income after dividend payments to shareholders and after interest refunds, from the National Credit Union Administration. Federally sponsored credit agencies: net income as reported in the annual reports of the following agencies: the Federal Home Loan Bank Board, the Federal Home Loan Mortgage Corporation, and the Farm Credit System. Nondepository credit intermediation: receipts less deductions from IRS tabulations of corporate income tax	Commercial banking, savings institutions, and other depository credit intermediation: net income before tax—income before security gains and losses plus provisions for loan losses—for insured commercial banks and savings institutions reported to bank regulatory agencies and compiled by the FDIC in *Quarterly Banking Profile*. Credit unions: same as for annual. Federally sponsored credit agencies: same as for annual. Nondepository credit intermediation: net income from BEA tabulations of samples of shareholder reports.	Commercial banking, savings institutions, and other depository credit intermediation: for the revised estimate, same as for most recent year; for the preliminary estimate, if the *Quarterly Banking Profile* is not available, BEA tabulations of data from Federal Financial Institutions Examination Council *Call Reports*. Credit unions: judgmental trend. Federally sponsored credit agencies: same as for annual. Nondepository credit intermediation: same as for most recent year.

Table 13.A—Summary of Methodology Used to Prepare Estimates of Corporate Profits

Line in NIPA table 6.16	Component	Annual (except most-recent-year) estimates	Most-recent-year estimates* (Indicator series used to extrapolate prior annual estimate)	Current quarterly estimates (Indicator series used to extrapolate most-recent-year estimate) *
		returns, adjusted for understatement of income on tax returns and for conceptual differences.		
	Securities, commodity contracts, and investments	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Net income before tax from BEA tabulations of samples of shareholder reports.	Same as for most recent year.
	Insurance carriers and related activities	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Life insurance carriers: net income before tax from BEA tabulations of samples of shareholder reports. Property and casualty insurance carriers: net income before tax—investment income plus net underwriting gains less dividends paid to policyholders—and a portion of catastrophic losses from the Insurance Service Office. Insurance agencies, brokerages, and related services: judgmental trend.	Life insurance carriers: same as for most recent year. Property and casualty insurance carriers: for revised estimate, same as for most recent year; for preliminary estimate, BEA tabulations of samples of shareholder reports, and a portion of catastrophic losses that is judgmentally trended. Insurance agencies, brokerages, and related services: same as for most recent year.
	Funds, trusts, and other financial vehicles	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Real estate investment trusts: net income before tax from BEA tabulations of samples of shareholder reports. Regulated investment companies and other financial vehicles: judgmental trend.	Same as for most recent year.
	Management of companies and enterprises	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Bank holding companies: net income before tax—income before security gains and losses plus provisions for loan losses—for insured commercial banks reported to bank regulatory agencies and compiled by the FDIC in *Quarterly Banking Profile*. Other holding companies: judgmental trend.	Bank holding companies: for the revised estimate, same as for most recent year; for the preliminary estimate, if the *Quarterly Banking Profile* is not available, BEA tabulations of data from the FDIC *Call Reports*.

Table 13.A—Summary of Methodology Used to Prepare Estimates of Corporate Profits

Line in NIPA table 6.16	Component	Annual (except most-recent-year) estimates	Most-recent-year estimates* (Indicator series used to extrapolate prior annual estimate)	Current quarterly estimates (Indicator series used to extrapolate most-recent-year estimate) *
				Other holding companies: same as for most recent year.
13	Nonfinancial:			
14	Utilities	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Power generation and natural gas distribution (including combination electric and gas): net income before tax from BEA tabulations of samples of shareholder reports. Water, sewage, and other systems: judgmental trend.	Same as for most recent year.
15	Manufacturing	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Net income before tax from the Census Bureau *Quarterly Financial Report*, with adjustments for conceptual differences.	Same as for most recent year.
28	Wholesale trade	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Net income before tax from the Census Bureau *Quarterly Financial Report*, with adjustments for conceptual differences.	Same as for most recent year.
29	Retail trade	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Net income before tax from the Census Bureau *Quarterly Financial Report*, with adjustments for conceptual differences.	Same as for most recent year.
30	Transportation and warehousing	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Air transportation, rail transportation, water transportation, truck transportation, pipeline transportation, and other transportation and support activities: net income before tax from	Same as for most recent year.

Table 13.A—Summary of Methodology Used to Prepare Estimates of Corporate Profits				
Line in NIPA table 6.16	Component	Annual (except most-recent-year) estimates	Most-recent-year estimates* (Indicator series used to extrapolate prior annual estimate)	Current quarterly estimates (Indicator series used to extrapolate most-recent-year estimate) *
			BEA tabulations of samples of shareholder reports. Transit and ground passenger transportation and warehousing and storage: judgmental trend.	
31	Information	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Net income before tax from the Census Bureau *Quarterly Financial Report*, with adjustments for conceptual differences.	Same as for most recent year.
32	Other nonfinancial:			
	Agriculture, forestry, fishing, and hunting	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Farms: BEA estimates of net farm income, based on information from the U.S. Department of Agriculture. Other: judgmental trend.	Same as for most recent year.
	Mining	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Net income before tax from the Census Bureau *Quarterly Financial Report*, with adjustments for conceptual differences.	Same as for most recent year.
	Professional, scientific, and technical services	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of income on tax returns and for conceptual differences.	Computer systems design and related services and miscellaneous professional, scientific, and technical services: net income before tax from the Census Bureau *Quarterly Financial Report*, with adjustments for conceptual differences. Legal services: judgmental trend.	Same as for most recent year.
	Other	Receipts less deductions from IRS tabulations of corporate income tax returns, adjusted for understatement of	Construction; real estate; administrative and waste management services; educational services; health care and social assistance; arts, entertainment, and recreation;	Same as for most recent year.

Table 13.A—Summary of Methodology Used to Prepare Estimates of Corporate Profits				
Line in NIPA table 6.16	Component	Annual (except most-recent-year) estimates	Most-recent-year estimates* (Indicator series used to extrapolate prior annual estimate)	Current quarterly estimates (Indicator series used to extrapolate most-recent-year estimate) *
		income on tax returns and for conceptual differences.	accommodation and food services; and other services, except government: net income before tax from BEA tabulations of samples of shareholder reports. Rental and leasing services and lessors of intangible assets: judgmental trend.	
33	**Rest of the world**	Receipts and payments from BEA's international transactions accounts, adjusted to NIPA concepts and definitions.	Same as for annual.	Same as for annual.

* The description "Same as for annual" indicates that the estimate is prepared using a methodology similar to that used for the annual estimate rather than by using an indicator series to interpolate or extrapolate the annual estimate.

BEA Bureau of Economic Analysis
FDIC Federal Deposit Insurance Corporation
IRS Internal Revenue Service
NIPAs National income and product accounts

Technical Note: Adjustments to IRS Tax Return Data

This technical note provides detailed descriptions of the adjustments that are made to the IRS corporate tax return data on profits, taxes, and dividends in order to conform them to NIPA concepts and definitions. These adjustments are published annually in "Table 7.16. Relation of Corporate Profits, Taxes, and Dividends in the National Income and Product Accounts to Corresponding Measures as Published by the Internal Revenue Service." Reproductions of portions of this table are shown below in tables 13.4, 13.8, and 13.9.

Corporate profits before tax

The starting point for the derivation of the estimates of profits before tax (PBT) is "Total receipts less total deductions, IRS" shown on line 1 in table 13.4 below. For each industry, total receipts less total deductions is obtained from *Corporation Income Tax Returns.* (This item differs from income subject to tax, as defined on the corporate tax return, in that it includes tax-exempt interest and excludes special statutory deductions that are available for corporations.) The adjustments to the IRS data are discussed below in the order shown in the table.

Table 13.4—Relation of NIPA Corporate Profits to Corresponding Measures as Published by the IRS
[Billions of dollars]

Line in NIPA table 7.16	NIPA line item	2015
1	**Total receipts less total deductions, IRS**	1,927.5
2	Plus: Adjustment for misreporting on income tax returns	367.3
3	Posttabulation amendments and revisions[1]	66.5
4	Income of organizations not filing corporation income tax returns	117.1
5	Federal Reserve banks	101.2
6	Federally sponsored credit agencies[2]	7.9
7	Other[3]	7.9
8	Depletion on domestic minerals	20.1
9	Adjustment to depreciate expenditures for mining exploration, shafts, and wells	23.9
10	State and local taxes on corporate income	56.2
11	Interest payments of regulated investment companies	-156.2
12	Bad debt expense	123.9
13	Adjustment to depreciate expenditures for intellectual property products[4]	96.1
14	Disaster adjustments (net)[5]	0.0

	Less: Tax return measures of:	
15	Gains, net of losses, from sale of property	297.8
16	Dividends received from domestic corporations	294.1
17	Income on equities in foreign corporations and branches (to U.S. corporations)	261.0
18	Costs of trading or issuing corporate securities[6]	55.1
19	Excess of employer expenses over actual employer contributions for defined benefit employee pension plans[7]	1.4
20	Plus: Income received from equities in foreign corporations and branches (by all U.S. residents, net of corresponding payments)	395.2
21	**Equals: Profits before taxes, NIPAs**	2,128.3

1. Consists largely of an adjustment to expense all meals and entertainment, of oilwell bonus payments written off, of adjustments for insurance companies and savings and loan associations, of amortization of intangible assets, residential real estate disposal costs, and of tax-exempt interest income.
2. Consists of the Farm Credit System and the Federal Home Loan Banks.
3. Consists of nonprofit organizations serving business and of credit unions.
4. Intellectual property products consists of software, research and development, and entertainment, literary, and artistic originals.
5. Consists of disaster losses valued at historic-cost basis less net insurance receipts for disaster-related losses valued at replacement cost.
6. Includes the imputed financial service charge paid by corporations to domestic securities dealers who do not charge an explicit commission.
7. Employer expenses for defined benefit employee pension plans include actual employer contributions, imputed employer contributions, and imputed interest for unfunded (or overfunded) actuarial liability.

Adjustment for misreporting on income tax returns (line 2). This adjustment is primarily based on IRS audit data. Unlike the tax-return source data, which reflects a specific tax year, the audit data is based on the year the audit is resolved and collected. For the audit data, it is assumed there is a 1-year lag between the referenced tax year and the year in which the majority of audits for that tax year are resolved. Thus, for the misreporting adjustment, the most recent audit data is used to derive an adjustment for the preceding tax year. For example, in the 2018 comprehensive update of the NIPAs, 2016 was the most recent tax year, and 2015 was the year for which the available audit data were used to prepare the misreporting adjustment. For subsequent years, the adjustment was judgmentally extrapolated.

The IRS audit consists of three steps. First, the IRS audits a small sampling of corporations and recommends how much, if any, additional tax liability is owed. Next, the corporations can appeal those recommendations. Finally, a resolution between the corporation and the IRS is reached, and the corporation pays the IRS.

The methodology for the misreporting adjustment is to capture only the amount of tax actually collected (see the section "Taxes on Corporate Income"), raise it to a universe total, and then convert it from a tax-liability measure to a profits measure. The IRS publishes data on the recommended additional tax liability owed, stratified by asset size, but the amount actually collected is provided only for the total. Therefore, a ratio of

additional collected tax to recommended additional tax is developed and applied to the recommended amounts on an asset-by-size basis to derive a universal total for additional tax liability. Finally, this tax-liability estimate is converted to a profits estimate using the statutory tax rate.

The above methodology applies to corporations that are paying taxes on positive net income. For companies that report deficits and pay no taxes, the percentage of corporate deficits reported by IRS (based on historical research) is added to the above estimate of profits misreporting to arrive at the corporate misreporting adjustment.

Posttabulation amendments and revisions (line 3). This adjustment includes a number of various items. They are described briefly in table 13.5 below.

Table 13.5—Current Posttabulation Amendments and Revisions to IRS "Total Receipts Less Total Deductions"

Adjustment	Start year	Estimates (millions of dollars)	Type and purpose of adjustment[1]	Sources and methods
		2015		
Special assessments	1946	-646	Definitional adjustment: To reflect the inclusion of assessments for the costs of improvements, such as streets and curbs, that benefit property owners as expenses in calculating NIPA profits.	Adjustments are based on Census Bureau data on state and local government receipts.
Oil well bonus payments	1946	361	Definitional adjustment: To reflect the exclusion of bonus payments for drilling rights to land owners and lessors as expenses in calculating NIPA profits.	Adjustments are based on Energy Information Administration annual estimates of dry-hole expenses.
Fines	1978	-12,173	Definitional adjustment: To reflect the inclusion of fines as an expense in calculating NIPA profits.	Adjustments are based on federal budget data and on information on court awards.
Intangible amortization	1981	110,667	Definitional adjustment: To reflect the exclusion of the amortization of intangible assets as an expense in calculating NIPA profits.	Adjustments are based on *CITR* data.
Imputed tax returns	1984	0	Coverage adjustment: To replace imputed tax data for a year with the tax return data for that year	Adjustments are based on IRS data.
1120-S pass through	1987	-27,070	Definitional adjustment: To restate profits of small business corporations to reflect the income and expenses that are passed to shareholders rather than reported by the corporation.	Adjustments are based on *CITR* tabulations.
Business entertainment	1987	-23,562	Definitional adjustment: To treat all the expenses for business meals and beverages and entertainment as expenses in calculating NIPA profits.	Adjustments are based on BEA's input-output calculations. Corporate share is based on *CITR* tabulations.
Insurance adjustments	1985	4,258	Definitional adjustment: To remove all unpaid premiums and losses from receipts and deductions so that the profits of property and casualty insurance companies and of mutual life insurance companies are restated and reflect the amounts paid to policyholders as dividends.	Adjustments are based on *CITR* tabulations.
Dividends received from Federal Reserve banks (FRBs) and Federal Home Loan Banks (FHLBs)	1959	-3,184	Definitional adjustment: To reflect the exclusion of taxable dividends received by commercial banks from Federal Reserve banks and by savings and loan associations from FHLBs, which are included in *CITR* "other receipts," from NIPA profits.[1]	Adjustments are based on FRB and FHLB data.
Domestic production activities deduction	2005	36,354	Definitional adjustment: To remove the deduction for domestic production activities from the calculation of NIPA profits.	Adjustments are based on *CITR* data.

Residential real estate disposal costs	1929	-1423	Definitional adjustment: Residential disposal costs are capitalized for NIPA purposes and thus included in estimates of capital consumption allowance (CCA). For tax purposes, residential disposal costs adjust the basis on which capital gains (losses) are calculated. Because profits measures exclude the impact of capital gains (losses), a subtraction adjustment is made to offset the related CCA adjustment.	Adjustments are based on NIPA investment data.

BEA Bureau of Economic Analysis
CITR *Statistics of Income: Corporation Income Tax Returns*
IRS Internal Revenue Service
NIPA National income and product accounts
1. Dividends received by domestic corporations are excluded from NIPA profits; see line 16 of NIPA table 7.16.

Income of Federal Reserve banks and other federally sponsored credit agencies (lines 5 and 6). Federal Reserve banks, Federal Home Loan Banks, and the Farm Credit System are included in the corporate sector of the NIPAs. Because these institutions do not file tax returns, their income and expenses are not included in *Corporation Income Tax Returns.* Through this adjustment, the profits of these institutions are included in PBT, based on information on net income from their annual reports.

Other organizations not filing corporation income tax returns (line 7). Personal injury trusts, the Universal Service Administration Company (USAC), and nonprofit organizations serving business that are exempt from income tax under section 501(c) are included in the NIPA corporate sector. Personal injury trusts are business-established independent legal entities that administer payments for damages resulting from product liability claims. These payments are considered transfer payments from business to persons at the time the funds are disbursed. Receipts and payments data are collected from individual trust fund reports. USAC earnings are measured as receipts less outlays, from the *Monthly Treasury Statement.* The earnings (surplus) of agricultural organizations, business leagues, chambers of commerce, real estate boards, boards of trade, and organizations to finance crop operations are based on IRS tabulations of information returns filed by tax-exempt organizations.

The earnings of credit unions are treated as PBT in the NIPAs; however, they are not reflected in *Corporation Income Tax Returns,* because income of these institutions is not taxed. The adjustment consists of net income less dividends to shareholders and interest refunds as tabulated by the National Credit Union Administration for state-chartered and federally chartered credit unions.

Depletion on domestic minerals (line 8). Natural resource discoveries are not considered to be capital formation in the NIPAs; consequently, depletion—the charge for the using up of these resources—is not a charge against current production. In contrast, the IRS permits depletion to be charged as an expense. Through this adjustment, the *Corporation Income Tax Returns* expense "depletion" is reduced by the domestic depletion claimed on

tax returns, thereby increasing profits. The adjustment is calculated as the difference between depletion from *Corporation Income Tax Returns* and an estimate of foreign depletion based on special IRS studies. (The effect of foreign depletion is removed in line 17.)

Adjustment to depreciate expenditures for mining exploration, shafts, and wells (line 9). Expenditures for mining exploration, shafts, and wells are treated as capital formation in the NIPAs. In contrast, the IRS permits some of these expenditures to be charged as current expense. Therefore, "other deductions" in *Corporation Income Tax Returns* are adjusted to remove the expensed portion of the current year's investment and to add depreciation charges on investment made in the current and in previous years.

Estimates of oil and natural gas drilling expenses are obtained from data on drilling footage and on prices from the American Petroleum Institute's *Joint Association Survey on Drilling Costs,* BLS producer price indexes (PPIs), and until 1995, the Census Bureau's Annual Survey of Oil and Gas. Beginning with 2006, prices are based on the Census Bureau's Annual Capital Expenditures Survey and on PPIs. Estimates of expenses for the construction of mine shafts (for minerals other than petroleum and natural gas) are based on the quinquennial economic census and on capital expenditures from the Annual Capital Expenditures Survey. Depreciation charges for investment in mining exploration, shafts, and wells are estimated using a perpetual inventory calculation in which the investment is depreciated over time.

The adjustment is prepared as an aggregate for all business and is allocated by legal form of organization and by industry, based on IRS tax-return data.

State and local taxes on corporate income (line 10). PBT is measured before deduction of income taxes. Because state and local income taxes are expense items on the federal tax return, they must be added to *Corporation Income Tax Returns* "total receipts less deductions." The estimate of taxes is based on state and local government receipts compiled by the Census Bureau in *Quarterly Summary of State and Local Tax Revenue*. The industry distribution of these taxes is based on data from *Corporation Income Tax Returns* for federal income tax liability.

Interest payments of regulated investment companies (line 11). Interest payments of regulated investment companies are not reflected as expenses in the *Corporation Income Tax Returns* measure of total deductions. The adjustment adds interest payments as an expense in calculating NIPA profits and is estimated as interest received less the interest share of total deductions, based on *Corporation Income Tax Returns* tabulations for regulated investment companies.

Bad debt expense (line 12). Bad debt expenses are not considered to be expenses associated with current production and thus should not be reflected as expenses in calculating NIPA profits. The adjustment removes these expenses, based on the bad-debt expense item in the *Corporation Income Tax Returns*.

Adjustment to depreciate expenditures for intellectual property products (line 13). Expenditures for intellectual property products are treated as capital formation in the NIPAs.[16] In contrast, the IRS permits some of these expenditures to be charged as current expense. Therefore, "other deductions" in *Corporation Income Tax Returns* are adjusted to remove the expensed portion of the current year's investment and to add depreciation charges on investment made in the current and in previous years. This adjustment is described briefly in table 13.6 below.

Table 13.6—Adjustment to Depreciate Expenditures for Intellectual Property Products

Adjustment	Start year	Estimates (millions of dollars) 2015	Type and purpose of adjustment[1]	Sources and methods
Research and development	1929	70,639	Definitional adjustment: Business and government expenditures for research and development are recognized as fixed investment.	Adjustments are primarily based on BEA investment data, which in turn, are based on National Science Foundation survey data.
Software	1959	18,881	Definitional adjustment: Business and government expenditures for software are recognized as fixed investment.	Adjustments are primarily based on BEA investment data, which in turn, are based on Census Bureau Economic Census and survey data and on Bureau of Labor Statistics survey data.
Entertainment, literary, and artistic originals	1929	6,606	Definitional adjustment: Business and government expenditures for entertainment originals are recognized as fixed investment.	Adjustments are primarily based on BEA investment data, which in turn, are based on Census Bureau Economic Census and survey data.

Note. For more information on the sources and methods for intellectual property products, see the technical note at the end of "Chapter 6: Private Fixed Investment."

Disaster adjustments (net) (line 14). In the NIPAs, the loss of capital as a result of a catastrophic disaster and the insurance payouts that result from them do not affect income associated with current production. The adjustment consists of (1) the net of the value of

[16] As part of the 2013 comprehensive update of the NIPAs, BEA began treating expenditures on research and development and on entertainment, literary, and artistic originals as fixed investment and thus the depreciation of these assets as consumption of fixed capital. For more information, see "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts," *Survey* 93 (March 2013): 14–20.

losses recorded as depreciation (a current business expense) and (2) the insurance payouts made by insurance companies as a charge against profits less the income received by the claim holders.[17]

Depreciation estimates are based on data on insured damages at current cost, broken down by type, from the Insurance Service Office. The amount is adjusted for uninsured damages, distributed by industry according to regional impact using data from the Census Bureau's *County Business Patterns*, and converted to historic-cost depreciation using various service lives and price indexes. In contrast, the IRS allows all uninsured disaster losses to be charged as current business expenses in "other deductions" on Form 4684.

Insurance payouts and receipts are also based on data from the Insurance Service Office, supplemented by government insurance fund transactions. Income receipts are distributed by industry using the above information on historic-cost depreciation.

Gains, net of losses, from sale of property (line15). Gains (net of losses) from sales of fixed assets and securities are not considered to be income from current production. *Corporation Income Tax Returns* total receipts less total deductions are adjusted to remove these gains and losses. The adjustment consists of the following items from *Corporation Income Tax Returns*: (1) the excess of net short-term capital gain over net long-term capital loss, from Schedule D, (2) the excess of net long-term capital gain over short-term capital loss (except for regulated investment companies), from schedule D, and (3) the net gain or loss from Form 4797 with two modifications for cases in which the gain or loss reflects current production.

The first modification relates to income from the sale of timber, coal, iron ore, livestock, and unharvested crops. This income is treated as a gain or a loss for tax purposes but should be included in NIPA profits because it reflects current production. Therefore, an estimate of such gains or losses, based on data from *Corporation Income Tax Returns* and from BEA special studies, is subtracted from the *Corporation Income Tax Returns* net gains.

The second modification relates to "normal" accidental damage to fixed business capital.[18] In *Corporation Income Tax Returns,* the net gains items include the excess of insurance payments for accidental damage over the historical-cost book value of the damaged property. In the NIPAs, this amount is not considered a capital gain: the insurance payment is an expense of current production for insurance carriers, and the historical cost of the damaged property is treated as depreciation. Thus, the *Corporation*

[17] In the 2009 comprehensive update, BEA introduced a new treatment of major disasters (those in which either the associated property losses or the insurance payouts exceed 0.1 percent of GDP) that records them as "changes in the volume of assets" rather than as consumption of fixed capital; see Eugene P. Seskin and Shelly Smith, "Preview of the 2009 Comprehensive Revision of the NIPAs: Changes in Definitions and Presentations," *Survey* 89 (March 2009): 11–15.

[18] The NIPA treatment of the loss of capital as a result of a catastrophic disaster was covered in the above discussion of line 14.

Income Tax Returns net gains items are modified to exclude the amount of excess, which is estimated as the difference between the insurance payments, based on data on insurance losses from *Best's Aggregates and Averages: Property-Casualty*, and BEA estimates of normal accidental damage to fixed capital other than repairable damage (see NIPA table 7.13, line 5).

Dividends received from domestic corporations (line 16). These dividends are not part of corporate income from current production. However, receipts by corporations of dividends paid to them by other domestic corporations are included in total receipts less deductions in *Corporation Income Tax Returns.* This adjustment, based on information from *Corporation Income Tax Returns*, removes these dividends.

Income on equities in foreign corporations and branches (to U.S. corporations) (line 17). This adjustment places total receipts less total deductions from *Corporation Income Tax Returns* on a domestic basis by removing the income earned abroad by U.S. corporations that is included in this total. The adjustment is estimated as the sum of (1) dividends received from abroad, from *Corporation Income Tax Returns;* (2) other foreign-source income reported in support of claims for foreign tax credits, from special IRS tabulations of Form 1118; and (3) income earned by U.S. corporations from operations in U.S. commonwealths and territories, from special IRS tabulations.

Costs of trading or issuing corporate securities (line 18). The costs of trading and issuing corporate securities are treated as expenses of the current period in calculating NIPA profits. In contrast, in tax accounting, these costs are usually deferred, so an adjustment is needed. This adjustment can be divided into two parts: commissions (both explicit and implicit) and flotation costs (the costs of issuing debt or equity securities).

The securities trading costs adjustment converts tax data, which treat expenses for brokers' commissions as a reduction in future capital gains income, to a current-period expense for the purchase of brokers' services. Most corporate capital gains are excluded by subtracting net gains reported on IRS tax forms using IRS source data associated with Schedule D of IRS Form 1120. However, this adjustment does not account for the capital gains on own-account trading of securities brokers and dealers, which reflect the imputed financial service charge paid by corporations to domestic securities dealers who do not charge an explicit commission. Thus, a separate adjustment is needed to exclude these types of capital gains.

The securities trading costs adjustment treats commissions to brokers, commercial banks, and savings institutions from securities trading as an expense in the current period rather than as a reduction in future capital gains income. This adjustment applies to both explicit commissions and commissions indirectly charged through markups or "spreads" between the cost of acquiring a security and its sales price.

The estimates of trading costs are based on product-line data on gains from brokering and dealing equities, debt securities, and derivatives from the Census Bureau's 2012 Economic Census. These data are used to estimate total indirect commissions

received, which are treated as expenses of the corporations purchasing securities from broker-dealers, and are allocated by type of buyer using Federal Reserve Board flow of funds data on securities holdings. Estimates of direct commissions are derived similarly. For commercial banks and for savings institutions, capital gains are estimated as the sum of trading account gains and fees and of securities gains from the Federal Deposit Insurance Corporation data, less indirect commissions. For security brokers and dealers, estimates of capital gains through 2006 are based on data on gains from dealing and trading accounts from the Census Bureau's Service Annual Survey, less indirect commissions; thereafter, they are extrapolated based on company financial reports.[19]

For flotation costs, the adjustment is made to treat them as an expense in the current period rather than as amortized costs. The estimate is based on tabulations of new offerings of corporate securities and of associated expenses by the Securities and Exchange Commission (SEC). The allocation by industry is based on the SEC tabulations and on data on holdings of long-term mortgages and capital stocks from *Corporation Income Tax Returns*.

Excess of employer expenses over actual employer contributions for defined benefit employee pension plans (line19). Corporate income tax return data on employer expenses for defined benefit plans are adjusted to reflect the difference between cash-based and accrual-based compensation and the interest costs of any underfunded or overfunded actuarial liabilities.[20] The adjustment is based on data from the Employee Benefit Security Administration, the Pension Benefit Guarantee Corporation, the Social Security Administration, and the American Council of Life Insurance.

Income received from equities in foreign corporations and branches by all U.S. residents, net of corresponding payments (line 20). As noted previously, the adjustments to total receipts less total deductions thus far produce estimates of PBT for domestic industries and exclude rest-of-world profits. To arrive at PBT on a national basis, rest-of-the-world profits, derived from BEA's international transactions accounts (ITAs), are added as an adjustment. The derivation of the adjustment is shown in table 13.7 below.

[19] For additional information on securities trading adjustments, see Clinton P. McCully and Steven Payson, "Preview of the 2009 Comprehensive Revision: Statistical Changes," *Survey* 89 (May 2009): 13–14.
[20] As part of the 2013 comprehensive update of the NIPAs, the treatment of pension plans was improved by recording the transactions of defined benefit pension plans on an accrual basis and by recognizing the costs of unfunded liabilities. For more information, see "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts," 21–25.

Table 13.7--Derivation of the Rest-of-the-World Profits Measures
[Millions of dollars]

	Profits measures (receipts less payments) 2015 estimate	Receipts from rest of the world		Payments to rest of the world[1]	
		ITA item	2015 estimate	ITA item	2015 estimate
Profits before tax (PBT)	395,200		670,120		274,920
	295,862	Earnings on USDIA (table 4.1, line 4)	433,903	Earnings on FDIUS (table 4.1, line 26)	138,041
	296,408	Earnings (net of withhholding taxes)	433,332	Earnings (net of withhholding taxes)	136,924
	-546	Cross-border (withholding taxes)	571	Cross-border (withholding taxes)	1,117
	66,286	Other private receipts (part)	203,052	Other private receipts (part)	136,766
	33,051	Income of U.S. commonwealths and territories[2]	33,164	Income of U.S. commonwealths and territories[2]	113
Taxes on corporate income[3]	0		0		0
Net dividends	162,775		352,127		189,352
	96,488	Distributed earnings on USDIA (table 4.1, line 5)	149,075	Distributed earnings on FDIUS (table 4.1, line 27)	52,587
	97,034	Distributed (net of withhholding taxes)	148,504	Distributed (net of withhholding taxes)	51,470
	-546	Cross-border (withholding taxes)	571	Cross-border (withholding taxes)	1,117
	66,286	Other private receipts (part)	203,052	Other private receipts (part)	136,766
	55,718	Other private (net of withholding taxes)	188,351	Other private (net of withholding taxes)	132,633
	10,568	Cross-border (withholding taxes)	14,701	Cross-border (withholding taxes)	4,133
Undistributed profits	232,425		317,992		85,567
	199,375	Reinvested earnings on USDIA (table 4.1, line 6)	284,829	Reinvested earnings on FDIUS (table 4.1, line 28)	85,454
	33,051	Income of U.S. commonwealths and territories[2]	33,164	Income of U.S. commonwealths and territories[2]	113

FDIUS Foreign direct investment in the United States
USDIA U.S. direct investment abroad
1. Sign reversed.
2. The addition of the income for U.S. commonwealths and territories reflects the geographic coverage of the national income and product accounts.
3. Assumes that the foreign tax credit equals tax liability on income earned abroad.
Note. Profits from the rest of the world do not include an inventory valuation adjustment.

The adjustment consists of receipts by all U.S. residents, including both corporations and persons, of earnings (both distributed and reinvested) of foreign affiliates of U.S. direct investors and of the dividends portion of "other" private receipts, less corresponding outflows. All items are recorded net of income taxes and of capital

gains and losses—except the dividend portions of both direct investment income and portfolio income, which are recorded before the deduction of nonresident taxes withheld.

The data from the ITAs are adjusted to remove the transactions of the Commonwealth of Puerto Rico and of other U.S. commonwealths and territories in order to conform to the geographic coverage in the NIPAs—the 50 states and the District of Columbia (see the section "Geographic coverage" in chapter 2).

Taxes on corporate income

The starting point for the derivation of taxes on corporate income is IRS total income tax, which is shown as "Federal income and excess profits taxes, IRS" on line 22 in table 13.8 below. For each industry, this item is obtained from *Corporation Income Tax Returns.* It measures total income taxes before allowances for tax credits, and it is the gross federal income tax liability on income from all sources. The adjustments to the IRS data are discussed below in the order shown in the table.

Table 13.8—Relation of NIPA Corporate Taxes to Corresponding Measures as Published by the IRS
[Billions of dollars]

Line in NIPA table 7.16	NIPA line item	2015
22	**Federal income and excess profits taxes, IRS**	481.2
23	Plus: Posttabulation amendments and revisions, including results of audit and renegotiation and carryback refunds	-0.5
24	State and local taxes on corporate income	56.2
25	Taxes paid by domestic corporations to foreign governments on income earned abroad	10.9
26	Less: U.S. tax credits claimed for foreign taxes paid	110.2
27	Investment tax credit[8]	---
28	Other tax credits[8]	41.4
29	**Equals: Taxes on corporate income, NIPAs**	396.3
30	**Profits after tax, NIPAs (line 21 minus line 29)**	1,732.0

8. Beginning with 1984, the investment tax credit is included in other tax credits (line 28).

Posttabulation amendments and revisions, including results of audit and renegotiation and carryback refunds (line 23). An adjustment for the results of audit, renegotiation, and carryback refunds is necessary because *Corporation Income Tax Returns* tabulations are compiled from samples of unaudited tax returns. The audit adjustment is the amount of additional tax liability owed by firms that are actually audited. It is actual tax settlements

derived in the first step of the calculation of the audit adjustment for PBT (line 2 in table 13.4). The adjustment is distributed by industry in the same way as the audit adjustment for PBT. The audit adjustment is unique among tax adjustments in that the source data are not available to adjust the preliminary IRS tabulations; for that estimate, the adjustment is made judgmentally.

In the NIPAs, tax refunds resulting from net operating losses are viewed as reducing tax liability in the year of the loss. IRS permits corporations with such losses to carry the loss back to claim a refund for taxes paid in preceding years and to carry forward the amount of the loss to offset profits in future years. BEA obtains data on carryback refunds from IRS tabulations of applications for carryback refunds. The adjustment is allocated by industry on the basis of deficits reported in *Corporation Income Tax Returns.* No adjustment is required for carry-forward losses, because the lower tax payments are reflected in *Corporation Income Tax Returns.* As indicated in table 13.5, several of the posttabulation adjustments to profits also have a tax impact.

State and local taxes on corporate income (line 24). In the NIPAs, taxes on corporate income includes federal, state, and local taxes. Because state and local taxes are an expense item on the federal tax return, they must be added to the *Corporation Income Tax Returns* item, which includes only federal taxes. The estimate of taxes is based on state and local government receipts compiled by the Census Bureau in *Quarterly Summary of State and Local Tax Revenue*. The industry distribution of these taxes is based on data from *Corporation Income Tax Returns* for federal income tax liability. The adjustment is the same as that for PBT (shown on line 10 in table 13.4).

Taxes paid by domestic corporations to foreign governments on income earned abroad (line 25). This adjustment records the payment of nonresidential taxes on the exports of services and income. The estimates are based on the ITAs. The annual total is allocated to industries using the industry distribution of foreign tax credits, based on data from *Corporation Income Tax Returns.*

Tax credits (lines 26–28). The NIPA measure of taxes on corporate income reflects actual tax liability; consequently, tax credits must be subtracted from the *Corporation Income Tax Returns* tax item, which is before allowance for tax credits. Data for the adjustments by industry are from *Corporation Income Tax Returns*.

U.S. tax credits claimed for foreign taxes paid (line 26). The adjustment consists of the foreign tax credit (1929 forward) and the American Samoa economic development credit (2007 forward).

Investment tax credit (line 27). The adjustment is shown separately from 1962 through 1983; beginning with 1984, the investment tax credit is included in "other tax credits" (line 28).

Other tax credits (line 28). The adjustment includes all other corporate tax credits, whether they are always accounted for separately by the IRS, are always included

within the general business credit, or were at first accounted for separately but later included within the general business credit. The general business credit (1984 forward) combined the investment tax credit, the targeted jobs credit (1977 forward), the alcohol fuel credit (1980 forward), and the employee stock ownership credit (1982–86, then eliminated) and became the umbrella category under which most later tax credits are included and not listed separately.

Tax credits that are always listed separately are the prior year (alternative) minimum tax credit (1988 forward) and the credit to holders of tax credit bonds (2008 forward), which includes the qualified zone academy bond credit (1998 forward).

Tax credits that were listed separately at first but later included within the general business credit are the nonconventional source fuel credit (1980 forward, included beginning with 2006), the research activities credit (1981 forward, included beginning with 1986), and the orphan drug credit (1984 forward, included beginning with 1986).

Corporate dividends

The starting point for the derivation of dividends is IRS distributions to stockholders, cash and property except in own stock, which is shown as "Dividends paid in cash or assets, IRS" on line 32 in table 13.9 below. For each industry, this item is obtained from *Corporate Income Tax Returns.* It consists of cash and noncash payments out of current or retained earnings, and it does not include liquidating dividends or other distributions of paid-in capital. The adjustments to the IRS data are discussed below in the order shown in the table.

Table 13.9—Relation of NIPA Corporate Dividends to Corresponding Measures as Published by the IRS
[Billions of dollars]

Line in NIPA table 7.16	NIPA line item	2015
31	**Dividends paid in cash or assets, IRS**	1,870.1
32	Plus: Posttabulation amendments and revisions[9]	-411.4
33	Dividends paid by Federal Reserve banks and certain federally sponsored credit agencies[2]	114.9
34	U.S. receipts of dividends from abroad, net of payments to abroad	162.8
35	Earnings remitted to foreign residents from their unincorporated U.S. affiliates	9.5
36	Interest payments of regulated investment companies	-156.2
37	Less: Dividends received by U.S. corporations	420.1
38	Earnings of U.S. residents remitted by their unincorporated foreign affiliates	4.7
39	**Equals: Net corporate divided payments, NIPAs**	1,164.9

9, Consists largely of an adjustment to remove capital gains distributions of regulated investment companies.

Posttabulation amendments and revisions (line 32). Several of the posttabulation adjustments to profits have an impact on dividends as well. These and other posttabulation adjustments are described in table 13.10 below.

Table 13.10--Posttabulation Adjustments and Revisions to IRS "Dividends paid in Cash or Assets"

Adjustment	Start year	Estimates (millions of dollars) 2015	Type and purpose of adjustment[1]	Sources and methods
Personal foreign dividends	1959	0	Coverage adjustment: To include the dividends received by U.S. residents in "dividends received from the rest of world."	Adjustments are based on *CITR* dividends and data from BEA's international transactions accounts.
Dividends received from Federal Reserve banks and Federal Home Loan Banks	1929	-3,184	Definitional adjustment: See table 13.5.	See table 13.5.
Capital gains distributions	1940	41,382	Definitional adjustment: To remove these distributions by regulated investment companies.	Adjustments are based on *CITR* data for regulated investment companies.
Other[3]	1959	-4,748	"Other" adjustment: To reflect the exclusion of distributions that are not from current or retained earnings from dividends in the NIPAs.	Adjustments are based on IRS tabulations and shareholder reports.

BEA Bureau of Economic Analysis
CITR *Statistics of Income: Corporation Income Tax Returns*
IRS Internal Revenue Service
NIPAs National income and product accounts

1. The timing, coverage, definitional, and "other" adjustments are the differences between *CITR* "dividends paid in cash or assets" and dividends in the NIPAs.
2. According to the Tax Code, certain current-year distributions by these companies can be counted in the previous tax year.
3. These adjustments are grouped to avoid the disclosure of information.

Dividends paid by Federal Reserve banks and certain federally sponsored credit agencies (line 33). Federal Reserve banks, Federal Home Loan Banks, and the Farm Credit System are included in the corporate sector of the NIPAs. Because these institutions do not file

tax returns, their income and expenses are not included in *Corporation Income Tax Returns.* Through this adjustment, the dividends paid by these institutions are included in NIPA dividends, based on information from their annual reports. In addition, Federal Reserve banks are required to turn over their profits (less operating expenses) to the U.S. Treasury. Consequently, these payments, treated as dividends in the NIPAs, must be added to the IRS dividends. Data for this adjustment are from the Federal Reserve Board.

U.S. receipts of dividends from abroad, net of payments to abroad (line 34). The *Corporation Income Tax Returns* item "dividends received from foreign sources" includes only the dividends received by corporations. To arrive at dividends on a national accounts basis, their *Corporation Income Tax Returns* item is removed, and the ITA measure of dividends received by all U.S. residents is added. A corresponding adjustment is made to outflows. The foreign dividend measure used for this adjustment includes the distributed earnings of unincorporated affiliates of U.S. and foreign direct investors.

Earnings remitted to foreign residents from their unincorporated U.S. affiliates (line 35). By this adjustment, the distributions of unincorporated U.S. affiliates to their foreign direct investors are included as dividends paid. Net dividend payments by domestic industries are increased by this adjustment, and the receipt of these distributions by the rest of the world is reflected in the adjustments made to outflows in line 35. The annual total is allocated to industries based on data on dividends received from domestic corporations in *Corporation Income Tax Returns.*

Interest payments of regulated investment companies (line 36). Interest payments of regulated investment companies, primarily from money market funds, are included in the *Corporation Income Tax Returns* measure of cash distributions. This adjustment reclassifies such payments from dividends to interest. The adjustment is estimated as interest received less the interest share of total deductions, based on data for regulated investment companies from *Corporation Income Tax Returns*.

Dividends received by U.S. corporations (line 37). As noted earlier in the discussion of adjustments to PBT, the items for dividends received by corporations in *Corporation Income Tax Returns* are subtracted (line 16 plus a portion of line 17 in table 13.4) because they are not part of current production. This adjustment is made to the dividends component in order to obtain the appropriate measure of undistributed profits (which is calculated as PBT less taxes and dividends). The resulting measure of net dividends paid equals the dividend receipts of persons, government, and foreigners. The adjustment consists of domestic and foreign dividends received from *Corporation Income Tax Returns.*

Earnings of U.S. residents remitted by their unincorporated foreign affiliates (line 38). By this adjustment, the distributions of unincorporated foreign affiliates to U.S. residents are included as dividends received. Net dividend payments by domestic industries are reduced by this adjustment, and the payment of these distributions by the rest of the world is reflected in line 35. The annual total is allocated to industries based on data on dividends received from foreign corporations in *Corporation Income Tax Returns.*

Appendix: Domestic Corporate Gross Value Added and Related Measures

This appendix discusses the NIPA measure of domestic corporate gross value added and several related measures of corporate-sector activity that are presented in NIPA tables 1.14 and 1.15. Corporate gross value added is defined as the total value of all goods and services produced by the corporate sector (gross output) less the value of the goods and services that are used up in production (total intermediate inputs). It is derived as the sum of consumption of fixed capital, compensation of employees, taxes on production and imports less subsidies, and net operating surplus. The calculations of domestic gross corporate value added, net value added, and gross and net operating surplus are illustrated in the table below, which is based on NIPA table 1.14.

	2015 estimate (billions of dollars)
Compensation of employees	**5,944.4**
Wage and salary accruals	4,980.4
Supplements of wages and salaries	963.9
Plus: Taxes on production and imports less subsidies	**838.1**
Taxes on production and imports	844.5
Less: Subsidies	6.4
Plus: Net operating surplus	**2,099.4**
Net interest and miscellaneous payments	309.9
Net interest	292.0
Rents and royalties	17.9
Federal rents and royalties	6.7
State and local rents and royalties	11.2
Business current transfer payments (net)	124.3
Business payments to persons	43.9
Business payments to government	92.7
Business payments to ROW	0.1
Net insurance settlements	-12.4
Corporate profits with IVA and CCAdj	1,665.3
Equals: Net value added	**8,881.9**
Plus: Consumption of fixed capital	**1,588.2**
Equals: Domestic corporate gross value added	**10,407.1**
Less: Compensation of employees	5,944.4
Less: Taxes on production and imports less subsidies	838.1
Equals: Gross operating surplus	**3,687.6**

IVA Inventory valuation adjustment
CCAdj Capital consumption adjustment

In addition to the domestic total, estimates of gross value added are prepared for the financial and nonfinancial sectors. For the nonfinancial sector, estimates of gross value added in "real" terms—that is, adjusted for inflation—are also prepared. These estimates are derived by dividing the current-dollar estimates by the gross value added chain-type price index for nonfinancial industries from BEA's GDP-by-industry

accounts. Application of this index usually occurs with the first release of the profits estimates following the GDP-by-industry annual revision. For periods when this price index is not available, the chain-type price index for GDP goods and structures is used. This index is not published, although separate indexes for goods and for structures are shown in NIPA table 1.2.4. Incorporation of this index occurs with each release of the profits estimates. Estimates of real net value added are then derived as the difference between real gross value added and real consumption of fixed capital.

Information on prices, costs, profits, and value added are used to derive per unit measures for nonfinancial corporate business. These measures are presented in NIPA table 1.15, which is reproduced for the year 2015 below.

Line in NIPA table 1.15	NIPA line item	2015 estimate [dollars]
1	**Price per unit of real gross value added of nonfinancial corporate business**	**1.040**
2	**Compensation of employees (unit labor cost)**	**0.603**
3	**Unit nonlabor cost**	**0.294**
4	Consumption of fixed capital	0.160
5	Taxes on production and imports less subsidies plus business current transfer payments (net)	0.099
6	Net interest and miscellaneous payments	0.035
7	**Corporate profits with IVA and CCAdj (unit profits from current production)**	**0.143**
8	Taxes on corporate income	0.032
9	Profits after tax with IVA and CCAdj	0.111

IVA Inventory valuation adjustment
CCAdj Capital consumption adjustment

The per-unit measures are computed by dividing current-dollar nonfinancial gross value added and its components—compensation of employees, consumption of fixed capital, taxes on production and imports less subsidies, business current transfer payments (net), net interest, and corporate profits—by real (chained-dollar) nonfinancial gross value added. The resulting quotients (divided by 100) provide the value-added implicit price index and the parts of the price index that are associated with each component. Value-added unit costs attribute the changes in the value-added unit prices to its components in proportion to each component's share of current-dollar value added. Therefore, year-to-year changes in component shares of current-dollar value added result in changes in the contributions of the cost components to value-added prices even if the prices do not change.

APPENDIX: SUMMARY NATIONAL INCOME AND PRODUCT ACCOUNTS

(Updated: May 2019)

This appendix presents the definitions of the line items that make up the seven summary national income and product accounts (NIPAs). These accounts simplify both the transactors and transactions in the U.S. economy. The transactors are shown in three distinct groups, or sectors—persons, businesses, and government; a fourth sector for the rest of the world is added to cover transactions between U.S. residents and foreign residents. The seven summary accounts show the contribution of each sector to the output of the economy, their income and outlays, and their saving and investment.

The summary NIPAs, which are shown on the following two pages of this appendix, constitute a double-entry accounting system in which each of the entries in a summary account appears again in that account or in one of the other summary accounts. The numbers in parentheses indicate these "counter-entries." In some cases, an entry may be equal to another entry in the summary accounts. For example, supplements to wages and salaries appears in account 1, line 5 and in account 3, line 14. In other cases, an entry may be equal to a combination of other entries (or parts of other entries). For example, for private enterprise interest payments (account 2, line 2), the counter-entry includes parts of private enterprise interest receipts (account 2, line 21, of personal interest income (account 3, line 20), of government interest receipts (account 4, line 20), and of interest payments to the rest of the world (account 5, line 13).

For a description of the accounting principles that underlie the summary NIPAs, see the section "Accounting Framework" in "Chapter 2: Fundamental Concepts." For a more in-depth discussion, see U.S. Bureau of Economic Analysis, *An Introduction to National Economic Accounting*, Methodology Paper No. 1, September 2007.

Account 1. Domestic Income and Product Account

This account shows the production of all sectors of the U.S. economy. The right (product) side of the account shows GDP as the sum of final expenditures by consumers, private business, government, and foreigners, and the left (income) side of the account shows GDP as the sum of the incomes earned and the costs incurred in generating that production.

Line 1–1: Compensation of employees, paid

The total remuneration, both monetary and in kind, payable by employers to employees in return for their work during the period. It consists of wages and salaries and of supplements to wages and salaries (employer contributions for employee pension and insurance funds and employer contributions for government social insurance). In the NIPAs, compensation is presented on an accrual basis—that is, it reflects compensation liabilities incurred by the employer in a given period regardless of when the compensation is actually received by the employee.

Line 1–2: Wages and salaries

The total 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 nonqualified stock options; receipts-in-kind; and miscellaneous compensation of employees, such as judicial fees to jurors and to witnesses.

Line 1–3: Domestic (3–12)

Wages and salaries paid by domestic industries to U.S. residents.

Line 1–4: Rest of the world (5–15)

Wages and salaries paid by domestic industries to foreign residents.

Line 1–5: Supplements to wages and salaries (3–14)

Consists of employer contributions for employee pension and insurance funds and of employer contributions for government social insurance.

Line 1–6: Taxes on production and imports (4–15)

Taxes payable on products when they are produced, delivered, sold, transferred, or otherwise disposed of by their producers (such as federal excise taxes, custom duties, and state and local sales taxes). Also includes other taxes on production, such as taxes on ownership of assets used in production (for example, local real estate taxes, motor vehicle licenses, severance taxes, and special assessments). Does not include personal and corporate income taxes and personal property taxes.

Line 1–7: Less: Subsidies (4–8)

Payments from government agencies to private business (for example, federal subsidies to farmers) and to government enterprises (for example, federal subsidies to state and local public housing authorities) to support their current operations. In contrast, payments associated with the acquisition or disposal of assets are classified as capital transfers.

Line 1–8: Net operating surplus

A profits-like measure of the surplus accruing from the processes of production before deduction any explicit or implicit interest charges, rent, or other property incomes payable on financial assets, land, or other natural resources required to carry out production. It is equal to gross operating surplus less consumption of fixed capital.

Line 1–9: Private enterprises (2–19)

Consists of private business, the activities of households and institutions that are included within the production boundary of the NIPAs (primarily the services of owner-occupied housing), and, for the purpose of estimating monetary and imputed interest payments and receipts, nonprofit institutions serving households.

Line 1–10: Current surplus of government enterprises (4–28)

Current operating revenue and subsidies received from other levels of government less current expenses, such as intermediate purchases and employee compensation. In this calculation, no deduction is made for net interest paid, because the interest payments of government enterprises are not separately identified from other government interest in the government receipts and expenditures account.

Line 1–11: Consumption of fixed capital (6–14)

The NIPA measure of economic depreciation—that is, the decline in the value of the stock of fixed assets due to physical deterioration, normal obsolescence, and accidental damage except that caused by a catastrophic event. For nonprofit institutions serving households and for general government, Consumption of fixed capital serves as a measure of the value of the capital services of the fixed assets owned and used by these entities.

Line 1–12: ***Gross domestic income***

The sum of incomes earned, and costs incurred in the production of gross domestic product (GDP). Gross domestic income (GDI) is equal to the sum of compensation of employees, taxes on production and imports less subsidies, net operating surplus, and consumption of fixed capital. In theory GDI should equal GDP, 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.”

Line 1–13: Statistical discrepancy (6–20)

The difference between the NIPA measure of production that is derived as the sum of final expenditures (gross domestic product) and its counterpart measure that is derived as the sum of the costs incurred and the incomes earned in production (gross domestic income). The statistical discrepancy arises from the independent estimation of the two measures using different source data and methods. It is recorded in the NIPAs as an "income" component that reconciles the income side with the product side of the accounts.

Line 1–14: ***GROSS DOMESTIC PRODUCT***

BEA's featured measure of U.S. production. Gross domestic product (GDP) is the market value of the final goods and services produced by labor and property in the United States. GDP is equal to the sum of personal consumption expenditures, gross private domestic investment, net exports of goods and services, and government consumption expenditures and gross investment. GDP is also equal to the sum of value added by industry across all industries.

Line 1–15: Personal consumption expenditures (3–3)

The primary measure of consumer spending in the U.S. economy. It is the NIPA final-demand component that measures the value of the goods and services purchased by, or on the behalf of, "persons" who reside in the United States.

Line 1–16: Goods

Consists primarily of tangible products that can be stored or inventoried. Also includes certain intangible assets (software, research and development, and entertainment, literary, and artistic originals), which are classified as intellectual property products.

Line 1–17: Durable goods

Consists primarily of tangible products that can be stored or inventoried and that can be used repeatedly or continuously over a prolonged period. Also includes certain intangible products, such as software.

Line 1–18: Nondurable goods

Tangible products that can be stored or inventoried and that are usable over a relatively short period.

Line 1–19: Services

Products, such as medical care and transportation, that cannot be stored and that generally are consumed at the place and time of their purchase.

Line 1–20: Gross private domestic investment

The private-investment component of final demand in the NIPAs. It comprises gross private fixed investment and change in private inventories.

Line 1–21: Fixed investment (6–2)

Component of gross private domestic investment that measures additions and replacements to the stock of private fixed assets without deducting depreciation. It consists of two components: nonresidential fixed investment and residential fixed investment.

Line 1–22: Nonresidential

Component of gross private fixed investment that measures investment by businesses and nonprofit institutions in nonresidential structures, equipment, and intellectual property products.

Line 1–23: Structures

Component of nonresidential fixed investment that measures new construction (including own-account investment), improvements to existing structures, expenditures on new nonresidential mobile structures, brokers' commissions on sale of structures, mineral exploration, and net purchases of used structures by private business and by nonprofit institutions from government agencies. Also includes equipment that is considered to be an integral part of a structure, such as plumbing, HVAC, and electrical systems.

Line 1–24: Equipment

Component of nonresidential fixed investment that consists of tangible products other than structures—such as new machinery, furniture, and vehicles—whether purchased or produced for own use. Also includes dealers' margins on sales of used equipment and net purchases of used equipment between sectors of the economy.

Line 1–25: Intellectual property products

Component of nonresidential fixed investment that consists of intangible products—whether purchased or produced for own use. In the NIPAs, these products consist of software, of research and development, and of entertainment, literary, and artistic originals.

Line 1–26: Residential

Component of gross private fixed investment that covers all private residential structures and residential equipment.

Line 1–27: Change in private inventories (6–4)

The component of gross private domestic investment that measures the change in the physical volume of inventories—additions less withdrawals—owned by private business, valued in average prices of the period. Inventories may be in the form of goods ready for sale (finished goods), of goods undergoing production (work in process), or of goods acquired for use in the production process (materials and supplies). Change in private inventories differs from the change in the book value of inventories reported by most businesses, which are valued using a variety of accounting methods and thus may include holding gains or losses resulting from price changes.

Line 1–28: Net exports of goods and services

The net foreign component of final demand in the NIPAs. It is calculated as exports of goods and services less imports of goods and services.

Line 1–29: Exports (5–1)

Goods and services that are sold, given away, or otherwise transferred by U.S. residents to foreign residents.

Line 1–30: Imports (5–13)

Goods and services that are sold, given away, or otherwise transferred by foreign residents to U.S. residents.

Line 1–31: Government consumption expenditures and gross investment (4–1 plus 6–3)

The government component of final demand in the NIPAs. It comprises two components: (1) government consumption expenditures, which consists of spending by general government to produce and provide services to the public; and (2) government gross investment, which consists of spending by both general government and government enterprises for fixed assets that benefit the public or that are used by government agencies in their production activities. It excludes government spending for social benefits, grants, and subsidies.

Line 1–32: Federal

Line 1–33: National defense

Activities covered by the national defense function of the federal budget—that is, Department of Defense military activities, defense-related atomic energy activities of the Department of Energy, and defense-related activities of other federal agencies.

Line 1–34: Nondefense

All activities of the federal budget that are not covered by the national defense function.

Line 1–35: State and local

Line 1–36: ***GROSS DOMESTIC PRODUCT***

For definition, see entry 1–14.

Account 2. Private Enterprise Income Account

This account provides information on the sources and uses of the income of private businesses and other private enterprises.

Line 2–1: Income payments on assets

Payments by domestic private enterprises to the owners of assets for their use by others. It is the sum of interest and miscellaneous payments, dividend payments to the rest of the world, and reinvested earnings on foreign direct investment in the United States.

Line 2–2: Interest and miscellaneous payments (2–21 and 3–20 and 4–22 and 5–17)

Consists of monetary and imputed interest payments and of rents and royalty payments to government. Includes interest payments on mortgage and home improvement loans and on home equity loans because home ownership is treated as a business in the NIPAs.

Line 2–3: Dividend payments to the rest of the world (5–18)

Consists of dividend payments by U.S. corporations to foreign residents, plus earnings distributed by unincorporated U.S. affiliates to their foreign parents.

Line 2–4: Reinvested earnings on foreign direct investment in the United States (5–19)

Consists of payments to foreign residents of their share of the reinvested earnings of their incorporated and unincorporated U.S. affiliates. These earnings are treated as income payments on assets because the decision to retain earnings with a U.S. enterprise represents a deliberate investment decision on the part of the foreign investor.

Line 2–5: Business current transfer payments (net)

Consists of net payments by private business to persons, government, and the rest of the world for which no current services are performed.

Line 2–6: To persons (net) (3–24)

Includes donations by businesses to charitable organizations.

Line 2–7: To government (net) (4–25)

Includes Federal deposit insurance premiums and fines and regulatory inspection fees.

Line 2–8: To the rest of the world (net) (5–23 less 5-11 less 2-14)

Includes net insurance settlements paid to foreign policyholders.

Line 2–9: Proprietors' income with IVA and CCAdj (3–17)

The current-production income (including income in kind) of sole proprietorships and partnerships and of tax-exempt cooperatives. It excludes dividends and monetary interest received by nonfinancial proprietorships and partnerships (which is considered received by persons) and rental income of persons not primarily engaged in the real estate business.

Line 2–10: Rental income of persons with CCAdj (3–18)

The net 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 dwellings, and the royalties received by persons from patents, copyrights, and rights to natural resources.

Line 2–11: Corporate profits with IVA and CCAdj

The net income, before taxes, from current production of entities that are treated as corporations in the NIPAs. For corporate businesses, it is defined as gross output less the following expenses: intermediate inputs, compensation of employees, taxes on production and imports (less subsidies), consumption of fixed capital, net interest and miscellaneous payments, and business current transfer payments.

Line 2–12: Taxes on corporate income

Consists of taxes paid on corporate earnings to federal, state, and local governments and to foreign governments. These earnings include capital gains and other income excluded from profits before tax. The taxes are measured on an accrual basis, net of applicable tax credits.

Line 2–13: To government (4–16)

The sum of federal, state, and local government income taxes on all income subject to taxes, including capital gains and other income excluded from profits before tax.

Line 2–14: To the rest of the world (5–23)

Consists of nonresident taxes—that is, taxes paid by domestic corporations to foreign governments.

Line 2–15: Profits after tax with IVA and CCAdj

Corporate profits with IVA and CCAdj less taxes on corporate income.

Line 2–16: Net dividends (3–21 plus 4–23)

Payments in cash or other assets, excluding the corporation's 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.

Line 2–17: Undistributed corporate profits with IVA and CCAdj (6–12)

Corporate profits after tax with IVA and CCAdj less net dividends.

Line 2–18: ***USES OF PRIVATE ENTERPRISE INCOME***

Line 2–19: Net operating surplus, private enterprises (1–9)

For definition, see entry 1–9.

Line 2–20: Income receipts on assets

Receipts by the owners of assets for the use of these assets by others.

Line 2–21: Interest (2–2 and 3–4 and 4–7 and 5–5)

Monetary and imputed interest received by domestic private enterprises.

Line 2–22: Dividend receipts from the rest of the world (5–6)

Receipts by U.S. residents of dividends from foreign corporations plus earnings distributed by unincorporated foreign affiliates to their U.S parents.

Line 2–23: Reinvested earnings on U.S. direct investment abroad (5–7)

Receipts by U.S. residents of their share of the reinvested earnings of their incorporated and unincorporated foreign affiliates.

Line 2–24: ***SOURCES OF PRIVATE ENTERPRISE INCOME***

Account 3. Personal Income and Outlay Account

This account shows the sources and uses of income of individuals, enterprises that are owned by households, and nonprofit institutions that serve households.

Line 3–1: Personal current taxes (4–14)

Tax payments (net of refunds) by persons that are not chargeable to business expense and certain other payments that are made by persons to government agencies other than government enterprises. These taxes primarily consist of taxes on income, including realized capital gains, and on personal property. They do not include personal contributions for government social insurance.

Line 3–2: Personal outlays

The sum of personal consumption expenditures, personal interest payments, and personal current transfer payments to government and to the rest of the world.

Line 3–3: Personal consumption expenditures (1–15)

For definition, see entry 1–15.

Line 3–4: Personal interest payments (2–21 and 3–20 and 4–22 and 5–17)

Consists of all interest paid by individuals except mortgage interest, which is reflected in rental income of persons.

Line 3–5: Personal current transfer payments

The sum of payments by persons to government and to the rest of the world for which no current services are performed.

Line 3–6: To government (4–26)

Includes donations, fees, and fines paid to federal, state, and local governments.

Line 3–7: To the rest of the world (net) (5–21 minus 5-9)

Consists of personal remittances in cash and in kind to the rest of the world less such remittances from the rest of the world.

Line 3–8: Personal saving (6–11)

Personal income less personal outlays and personal current taxes.

Line 3–9: ***PERSONAL TAXES, OUTLAYS, AND SAVING***

Line 3–10: Compensation of employees, received

The total remuneration in cash and in kind that accrues to employees in return for their contribution to production during an accounting period, regardless of when they are paid.

Line 3–11: Wages and salaries

The total remuneration of employees in cash (including sick or vacation pay, severance pay, and commissions, tips, and bonuses) and in kind (such as transit subsidies and meals).

Line 3–12: Domestic (1–3)

For definition, see entry 1–3.

Line 3–13: Rest of the world (5–3)

Wages and salaries that U.S. residents receive from the rest of the world.

Line 3–14: Supplements to wages and salaries (1–5)

Consists of employer payments that are made on behalf of employees but are not included in the regular wage payments provided directly to employees.

Line 3–15: Employer contributions to employee pension and insurance funds

Consist of employer payments (including payments in kind) to private pension and profit-sharing plans, government employee retirement plans, private group health and life insurance plans, privately administered workers' compensation plans, and supplemental unemployment benefit plans.

Line 3–16: Employer contributions for government social insurance

Consists of employer payments under the following federal government and state and local government programs: old-age, survivors, and disability insurance; hospital insurance; unemployment insurance; railroad retirement; pension benefit guaranty; veterans life insurance; publicly administered workers' compensation; military medical insurance; and temporary disability insurance.

Line 3–17: Proprietors' income with IVA and CCAdj (2–9)

For definition, see entry 2–9.

Line 3–18: Rental income of persons with CCAdj (2–10)

For definition, see entry 2–10.

Line 3–19: Personal income receipts on assets

The sum of personal interest income and personal dividend income.

Line 3–20: Personal interest income (2–2 plus 3–4 plus 4–7 plus 5–5 less 2–21 less 4–22 less 5–17)

The interest income (monetary and imputed) of persons—including individuals and nonprofit institutions serving households—from all sources.

Line 3–21: Personal dividend income (2–16 less 4–23)

Payments made by corporations in cash or other assets, excluding the corporation's own stock, to persons who are U.S. residents.

Line 3–22: Personal current transfer receipts

Payments by business and government to persons for which no current services are performed.

Line 3–23: Government social benefits (4–4)

Includes social security benefits, medical benefits, veterans' benefits, and unemployment insurance benefits.

Line 3–24: From business (net) (2–6)

For definition, see entry 2–6.

Line 3–25: Less: Contributions for government social insurance, domestic (4–19)

Includes employer contributions for government social insurance (see entry 3–16) and 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.

Line 3–26: **PERSONAL INCOME**

The income that persons receive in return for their provision of labor, land, and capital used in current production, plus current transfer receipts less contributions for government social insurance (domestic). Personal income arising from current production consists of compensation of employees, proprietors' income with inventory valuation adjustment and capital consumption adjustment (CCAdj), rental income of persons with CCAdj, and personal income receipts on assets.

Account 4. Government Receipts and Expenditures Account

This account summarizes the combined transactions of federal, state, and local governments.

Line 4–1: Consumption expenditures (1–31)

For definition, see entry 1–31.

Line 4–2: Current transfer payments

The sum of government social benefits and other current transfer payments to the rest of the world.

Line 4–3: Government social benefits

The sum of government social benefits to persons and government social benefits payments to the rest of the world.

Line 4–4: To persons (3–23)

For definition, see entry 3–23.

Line 4–5: To the rest of the world (5–22)

Consists of U.S. government transfers, mainly social security benefits, to former residents of the United States.

Line 4–6: Other current transfer payments to the rest of the world (net) (5–22)

Consists of U.S. government military and nonmilitary grants in cash and nonmilitary grants-in-kind for foreign governments.

Line 4–7: Interest payments (2–21 and 3–20 and 4–22 and 5–17)

Interest paid by government to persons, to business, and to the rest of the world (that is, to foreign businesses, governments, and persons). Interest paid consists of monetary interest paid on public debt and other financial obligations.

Line 4–8: Subsidies (1–7)

For definition, see entry 1–7.

Line 4–9: Net government saving (6–13)

The sum of government current receipts (lines 14, 19, 20, 23, and 26 of account 4) less the sum of government current expenditures (lines 1, 2, 7, 8, less line 9 of account 4).

Line 4–10: Federal

Line 4–11: State and local

Line 4–12: ***GOVERNMENT CURRENT EXPENDITURES AND NET SAVING***

Line 4–13: Current tax receipts

The sum of personal current taxes, taxes on production and imports, taxes on corporate income, and taxes from the rest of the world.

Line 4–14: Personal current taxes (3–1)

For definition, see entry 3–1.

Line 4–15: Taxes on production and imports (1–6)

For definition, see entry 1–6.

Line 4–16: Taxes on corporate income (2–13)

For definition, see entry 2–13.

Line 4–17: Taxes from the rest of the world (5–10)

Consists largely of income taxes received by the federal government from foreigners.

Line 4–18: Contributions for government social insurance

Line 4–19: From persons (3-25)

Consists of contributions from employees who are U.S. residents.

Line 4–20: From the rest of the world (5-10)

Consists of contributions from employees who are foreign residents.

Line 4–21: Income receipts on assets

The sum of interest and miscellaneous receipts and dividends.

Line 4–22: Interest and miscellaneous receipts (2–2 and 3–4 and 4–7 and 5–5)

Includes monetary and imputed interest received by government on loans and investments from persons, from business, and from the rest of the world; miscellaneous receipts include Federal Outer Continental Shelf royalties and state and local rents and royalties.

Dividends (2–16 less 3–21)

Net dividends paid by corporations less interest received by persons.

Line 4-24: Current transfer receipts

The sum of receipts from business (net), from persons, and from the rest of the world.

Line 4–25: From business (net) (2–7)

For definition, see entry 2–7.

Line 4–26: From persons (3–6)

For definition, see entry 3–6.

Line 4–27: From the rest of the world (5-10)

Receipts from the rest of the world, primarily of fines and penalties.

Line 4–28: Current surplus of government enterprises (1–10)

For definition, see entry 1–10.

Line 4–29: ***GOVERNMENT CURRENT RECEIPTS***

Account 5. Foreign Transactions Current Account

This account presents information on exports and imports associated with foreign trade, income receipts and payments, and current taxes and other transfer payments. This account does not include transactions involving the acquisition or disposition of nonproduced nonfinancial assets nor capital transfers, which are shown in the foreign transactions capital account, nor does it include transactions in financial assets and liabilities.

Line 5–1: Exports of goods and services (1–29)

For definition, see entry 1–29.

Line 5–2: Income receipts from the rest of the world

The sum of wage and salary receipts and income receipts on assets.

Line 5–3: Wage and salary receipts (3–13)

For definition, see entry 3–13.

Line 5–4: Income receipts on assets

The sum of interest, dividends, and reinvested earnings on U.S. direct investment abroad.

Line 5–5: Interest (2–21 and 3–20 and 4–22)

For definitions, see entries 2–21, 3–20, and 4–22.

Line 5–6: Dividends (2–22)

For definition, see entry 2–22.

Line 5–7: Reinvested earnings on U.S. direct investment abroad (2–23)

For definition, see entry 2–23.

Line 5-8: Current taxes, contributions for government social insurance, and transfer receipts from the rest of the world

Line 5-9: To persons (5-21 less 3-7)

For definition, see entry 3-7.

Line 5-10: To government (4-17 plus 4-20 plus 4-27)

For definitions, see entries 4-17, 4-20, and 4-27.

Line 5-11: To business (2-8)

For definition, see entry 2-8.

Line 5–12: ***CURRENT RECEIPTS FROM THE REST OF THE WORLD***

Line 5–13: Imports of goods and services (1–30)

For definition, see entry 1–30.

Line 5–14: Income payments to the rest of the world

The sum of wage and salary payments and income payments on assets.

Line 5–15: Wage and salary payments (1-4)

For definition, see entry 1–4.

Line 5–16: Income payments on assets

The sum of interest, dividends, and reinvested earnings on foreign direct investment in the United States.

Line 5–17: Interest (2–2 and 3–4 and 4–7)

For definitions, see entries 2–2, 3–4, and 4–7.

Line 5–18: Dividends (2–3)

For definition, see entry 2–3.

Line 5–19: Reinvested earnings on foreign direct investment in the United States (2–4)

For definition, see entry 2–4.

Line 5–20: Current taxes and transfer payments to the rest of the world

The sum of transfer payments from persons, from government, and from business.

Line 5–21: From persons (3–7)

For definition, see entry 3–7.

Line 5–22: From government (4–5 plus 4–6)

For definitions, see entries 4–5 and 4–6.

Line 5–23: From business (2–8 and 2–14)

For definitions, see entries 2–8 and 2–14.

Line 5–24: Balance on current account, NIPAs (7–1)

Net measure of transactions between the United States and the rest of the world in goods, services, income, and current transfers.

Line 5–25: ***CURRENT PAYMENTS TO THE REST OF THE WORLD AND BALANCE ON CURRENT ACCOUNT***

Account 6. Domestic Capital Account

This account shows the relationship between saving and investment for the U.S. economy.

Line 6–1: Gross domestic investment

Measures the total investment in the United States in fixed assets (that is, the structures, equipment, and intellectual property products that are used in production) and in inventories (change in private inventories).

Line 6–2: Private fixed investment (1–21)

For definition, see entry 1–21.

Line 6–3: Government fixed investment (1–31)

For definition, see entry 1–31.

Line 6–4: Change in private inventories (1–27)

For definition, see entry 1–27.

Line 6–5: Capital account transactions (net) (7-2)

The sum of transfer payments for catastrophic losses (net) and other capital account transactions.

Line 6–6: Transfer payments for catastrophic losses (7–3)

Consists of disaster-related insurance payouts (both primary and reinsurance) to the rest of the world less such payouts received from the rest of the world.

Line 6–7: Other capital account transactions (7–4)

Consists of all other capital transfers (mainly debt forgiveness and migrants' transfers) and transfers of nonproduced nonfinancial assets to (or from) the rest of the world.

Line 6–8: Net lending or net borrowing (–), NIPAs (7–5)

The balance on current account less capital accounts transactions (net). It may be viewed as an indirect measure of the net acquisition of foreign assets by U.S. residents less the net acquisition of U.S. assets by foreign residents.

Line 6–9: ***GROSS DOMESTIC INVESTMENT, CAPITAL ACCOUNT TRANSACTIONS (NET), AND NET LENDING, NIPAs***

Line 6–10: Net saving

The sum of personal saving, undistributed corporate profits with inventory valuation and capital consumption adjustments, and net government saving. It is a measure of the saving that is available for adding to the nation's net stock of fixed assets or for lending to the rest of the world.

Line 6–11: Personal saving (3–8)

For definition, see entry 3–8.

Line 6–12: Undistributed corporate profits with IVA and CCAdj (2–17)

For definition, see entry 2–17.

Line 6–13: Net government saving (4–9)

For definition, see entry 4–9.

Line 6–14: Plus: Consumption of fixed capital (1–11)

For definition, see entry 1–11.

Line 6–15: Private

Comprises all corporate and noncorporate private entities organized for profit, other entities that produce goods and services for sale at a price that is based on the costs of production, and certain other entities that are treated as businesses in the NIPAs.

Line 6–16: Government

The sum of consumption of fixed capital by general government and by government enterprises.

Line 6–17: General government

Comprises all federal government and state and local government agencies except government enterprises.

Line 6–18: 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. Examples are the U.S. Postal Service and public water and sewage agencies.

Line 6–19: Equals: Gross saving

Net saving plus consumption of fixed capital.

Line 6–20: Statistical discrepancy (1–13)

For definition, see entry 1–13.

Line 6–22: ***GROSS SAVING AND STATISTICAL DISCREPANCY***

Account 7. Foreign Transactions Capital Account

This account presents information on transactions with foreigners involving the acquisition or disposition of nonproduced nonfinancial assets and on capital transfers.

Line 7–1: ***BALANCE ON CURRENT ACCOUNT, NIPAs (5–24)***

For definition, see entry 5–24.

Line 7–2: Capital account transactions (net) (6-5)

The sum of transfer payments for catastrophic losses (net) and other capital account transactions.

Line 7–3: Transfer payments for catastrophic losses (net) (6–6)

For definition, see entry 6–6.

Line 7–4: Other capital account transactions (6–7)

For definition, see entry 6–7.

Line 7–5: Net lending or net borrowing (–), NIPAs (6–8)

For definition, see entry 6–8.

Line 7–6: ***CAPITAL ACCOUNT TRANSACTIONS (NET) AND NET LENDING, NIPAs***

CCAdj Capital consumption adjustment
IVA Inventory valuation adjustment
NIPAs National income and product accounts

GLOSSARY: NATIONAL INCOME AND PRODUCT ACCOUNTS

(Updated: November 2019)

This glossary presents the definitions of terms that are associated with the U.S. national income and product accounts (NIPAs). The terms relate to the concepts, classifications, and accounting framework of the NIPAs, the general sources and methods used to prepare the NIPA estimates, and the line items that make up the seven summary NIPAs. For the most part, the NIPA definitions are consistent with those used in general economic accounting, such as the *System of National Accounts* (SNA); where appropriate, explanations of differences are provided. This glossary is intended to be a living reference that will be updated and expanded to reflect changes and additions as they are incorporated into the NIPA Handbook.

Term	Definition
Accrual accounting	Method of accounting that records the sale of goods or assets when ownership is transferred, the sale of services when they are provided, the generation of output when goods or services are produced, the consumption of intermediate goods and services when they are used, and the compensation of employees when it is earned.
Administrative data	Data tabulated as a byproduct of administering programs of the federal government and of state and local governments—such as processing corporate tax returns, regulating public utilities, issuing building permits, and handling unemployment insurance claims.
"Advance" quarterly estimates	First vintage of the three sets of current quarterly estimates of GDP and its components, the advance estimates are released near the end of the month that follows the end of the reference quarter. For most GDP components, the advance estimates are based on source data that cover 2 or 3 months of the quarter and that are subject to revision.
Annual industry accounts	Part of BEA's industry economic accounts, these accounts consist of the annual input-output accounts and the GDP-by-industry accounts.
Annual input-output (I-O) accounts	Part of BEA's annual industry accounts, these accounts consist of a set of I-O tables—make table, use table, and several supplementary tables— that provide a time series of consistent statistics on the flow of goods and services that make up the production process of industries and to final users in the economy. For each year, beginning with 1998, the accounts show how industries interact as they provide inputs to, and use outputs from, each other to produce GDP. These accounts, which are consistent with the GDP-by-industry accounts, incorporate less comprehensive source data than those used for the benchmark I-O accounts.

Annual NIPA revisions	See Annual NIPA updates.
Annual NIPA updates	Periodic updates of the NIPA estimates usually carried out each summer. These updates incorporate newly available source data that are based on more extensive annual surveys, on annual data from other sources, and on revisions to the monthly and quarterly source data that were not available for incorporation into the NIPA current quarterly estimates. The revisions cover at a minimum the 3 most recent calendar years, but BEA may extend the revision period to allow for the incorporation of improvements in methodologies when warranted. Also referred to as "annual revisions."
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 level of activity measured for a quarter or for 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 level of activity by 4 (for quarterly data) or by 12 (for monthly data).
Annual rates of change	Percent changes in quarterly NIPA estimates are expressed at annual rates, which show the value that would be registered if the pace of activity measured for a quarter were maintained for a full year. Calculating these changes requires a variant of the compound interest formula.
Asset	Entity that functions as a store of value and over which ownership rights are enforced and from which economic benefits may be derived by the owner.
Asset boundary	In the U.S. national economic accounts, the asset boundary includes transactions involving financial assets and produced and nonproduced nonfinancial assets.
Average of GDP and GDI	A supplemental measure of economic activity that equally weights the measures of GDP and GDI.
Balance of payments	See "International transactions accounts."
Balance on current	Net measure of transactions between the United States and the rest of the world in goods, services, income, and current transfers.
Balance sheet	A statement showing the value of assets owned and the financial claims (or liabilities) incurred by an economic unit or sector at a specified point in time.
Base period	In the derivation of quantity or price estimates, the period from which the weights are drawn for a fixed-weighted index.

Benchmark input-output (I-O) accounts	Part of BEA's industry economic accounts, these accounts consist of a set of I-O tables—make table, use table, and several supplementary tables—that provide detailed statistics on the flow of goods and services from each industry to other industries and to final users in the economy. These accounts, which are prepared at about 5-year intervals, are based on comprehensive data from the Census Bureau's quinquennial Economic Census. The benchmark I-O accounts are used to determine the structure and level of GDP for the comprehensive revisions of the NIPAs.
Benchmark NIPA revisions	See "Comprehensive NIPA updates."
Best change	A procedure for incorporating newly available source data so that the estimates provide accurate measures of change across time periods, though the levels of the estimates may not be consistent with the newer source data. Because, in general, the levels of economic time series are only revised as part of an annual or a comprehensive update, newly available source data are frequently incorporated into the current quarterly estimates on a best-change basis in order to avoid discontinuities in the time series. In general, the best-change procedure is carried out by applying quarter-to-quarter growth rates from the source data to a previously published estimate for an earlier period.
Best level	A procedure for incorporating newly available source data so that the estimated levels of the time series are consistent with those of the source data. Incorporation of source data on a best-level basis is generally carried out as part of an annual or a comprehensive update.
Business current transfer payments (net)	Net payments by private businesses to persons, to government, and to the rest of the world for which no current services are performed, such as donations by business to charitable organizations. Does not include "capital transfers."
Business sector	Consists of private business (all corporate and noncorporate private entities organized for profit and certain other entities that are treated as businesses in the NIPAs) and of government enterprises (federal government enterprises and state and local government enterprises). See "Private business" and "Government enterprises."
Capital account	In economic accounting, an account that shows how saving is used to acquire nonfinancial assets, such as fixed assets and inventories. Also referred to as a "saving and investment account."
Capital consumption	See "Consumption of fixed capital."

Capital consumption adjustment (CCAdj)	The adjustment used to convert measures of depreciation that are based on historical-cost accounting—such as the capital consumption allowances reported on tax returns—to NIPA measures of private consumption of fixed capital that are based on current cost with consistent service lives and with empirically based depreciation schedules.
Capital consumption allowances (CCA)	Consists largely of tax-return-based depreciation charges for corporations and for nonfarm proprietorships and partnerships and of historical-cost depreciation charges (calculated by BEA) for farm proprietorships and partnerships, rental income of persons, and nonprofit institutions.
Capital formation	See "Gross domestic fixed investment" and "Gross fixed investment."
Capital gains or losses	Gains or losses that accrue during an accounting period to the owners of assets and liabilities as a result of changes in their prices. Also referred to as "holding gains or losses."
Capital services	The services derived from assets that are used in production. It can be measured either as the rental price charged for the use of the asset, or in the absence of a rental market, as the sum of consumption of fixed capital and the value of the return to capital (for government and for nonprofit institutions, the value of the return to capital is assumed to be zero).
Capital transfers	Cash or in-kind transactions in which the ownership of an asset is transferred from one economic unit to another, in which cash is transferred to enable the recipient to acquire another asset, or in which the funds realized by the disposal of another asset are transferred. Examples of capital transfers include capital grants made by the federal government to state and local government for construction of highways and estate or gift taxes.
Cash accounting	Method of accounting that records only cash payments and receipts and that records them at the time these payments or receipts occur.
Catastrophic losses	Unanticipated losses resulting from large scale, discrete, and recognizable events, such as hurricanes or earthquakes, that destroy assets. Such losses are not included in consumption of fixed capital but are instead classified as "other changes in the volume of assets" that are recorded as direct adjustments to the net capital stock and balance sheet.

Chained-dollar estimates	Inflation-adjusted estimates that are prepared to supplement the chain-type quantity indexes. In general, the chained-dollar estimates are calculated by multiplying the current-dollar value of an aggregate or component for the reference year by its corresponding chain-type quantity index and then dividing by 100. These estimates are denominated in units of the dollars of the reference year. The chained- dollar estimates may be used to calculate growth rates (which will be identical to those calculated using the quantity indexes), but because these estimates are not additive for periods other than the reference year, they should not be used to calculate component shares of an aggregate or to calculate component contributions to the growth of an aggregate.
Chain-type indexes	Quantity and price indexes that are based on the linking (chaining) of indexes for consecutive periods to form time series. In the NIPAs, annual changes in the quantities and prices calculated using a Fisher index formula that incorporates weights from 2 adjacent years are used to construct the chain-type indexes. These indexes eliminate the substitution bias found in indexes with unchanging (or "fixed") weights, and their movements are not affected by the choice of the reference period.
Change in private inventories (CIPI)	The component of gross private domestic investment that measures the change in the physical volume of inventories—additions less withdrawals—owned by private business, valued in average prices of the period. Inventories may be in the form of goods ready for sale (finished goods), of goods undergoing production (work in process), or of goods acquired for use in the production process (materials and supplies). CIPI differs from the change in the book value of inventories reported by most businesses, which are valued using a variety of accounting methods and thus may include holding gains or losses resulting from price changes.
Command-basis gross domestic product	An alternative measure of real GDP that provides information on the real purchasing power of the income generated by the production of goods and services. It reflects the impact of changes in the prices of traded goods and services as well as changes in production. Command- basis GDP is calculated by deflating both exports and imports by the price index for gross domestic purchases. Thus, it reflects the prices of *purchased* goods and services, while real GDP reflects the prices of *produced* goods and services. In the SNA, the term for this measure is "real gross domestic income."

Commodity-flow method	A method used by BEA to estimate various components of consumer spending, of investment in equipment and software, and of state and local government spending. The process begins with estimates of the domestic output or domestic sales or shipments of a commodity valued in producers' prices. Then, estimates of the domestic supply of that commodity—the amount that is available for domestic consumption— are prepared by adding imports and by subtracting exports and inventory change. Next, the domestic supply of the commodity is allocated among domestic purchasers—that is, persons, business, and government. Finally, the estimates are converted to purchasers' prices by adding transportation costs and trade margins.
Compensation of employees	The total remuneration, both monetary and in kind, payable by employers to employees in return for their work during the period. It consists of wages and salaries and of supplements to wages and salaries (employer contributions for employee pension and insurance funds and employer contributions for government social insurance). In the NIPAs, compensation is presented on an accrual basis—that is, it reflects compensation liabilities incurred by the employer in a given period regardless of when the compensation is actually received by the employee.
Comprehensive NIPA revisions	See Comprehensive NIPA updates.
Comprehensive NIPA updates	Extensive updates best available source data, including the benchmark input-output accounts; they provide the opportunity to make definitional, statistical, and presentational changes to the NIPAs; and they may affect estimates extending back for many years. Also referred to as "benchmark revisions" or "comprehensive revisions."
Constant prices	See "Laspeyres index" and "Chained-dollar estimates."
Consumer durable goods	Commodities, such as motor vehicles, that are purchased by consumers and are used repeatedly or continuously over a prolonged period. In the NIPAs, purchases of consumer durables are treated as personal consumption expenditures rather than as investment, but they are included in BEA's fixed assets and consumer durable goods accounts.
Consumption of fixed capital (CFC)	The NIPA measure of economic depreciation—that is, the decline in the value of the stock of fixed assets due to physical deterioration, normal obsolescence, and accidental damage except that caused by a catastrophic event. For nonprofit institutions serving households and for general government, CFC serves as a measure of the value of the capital services of the fixed assets owned and used by these entities.

Corporate business	In classification by legal form of organization in the NIPAs, corporate business comprises all entities required to file federal corporate tax returns, IRS Form 1120 series. It also includes mutual financial institutions and cooperatives subject to federal income tax, private noninsured pension funds, nonprofit organizations that primarily serve business, Federal Reserve banks, and federally sponsored credit agencies.
Command-basis gross national product (GNP)	An alternative measure of real GNP that provides information on the real purchasing power of the income generated by the production of goods and services. It reflects the impact of changes in the prices of traded goods and services as well as changes in production. Command- basis GNP is calculated by deflating both "exports plus income receipts" and "imports plus income payments" by the price index for gross domestic purchases. Thus, it reflects the prices of *purchased* goods and services, while real GNP reflects the prices of *produced* goods and services. In the SNA, the term for this measure is "real gross national income."
Corporate profits with inventory valuation and capital consumption adjustments	The net income, before taxes, from current production of entities that are treated as corporations in the NIPAs. For corporate businesses, it is defined as gross output less the following expenses: intermediate inputs, compensation of employees, taxes on production and imports (less subsidies), consumption of fixed capital, net interest and miscellaneous payments, and business current transfer payments. The estimates are based on receipts less expenses from corporate income tax returns, with adjustments to account for differences between federal tax law and NIPA concepts. Among these differences are the following: receipts exclude net capital gains and dividends received; expenses exclude bad debt, depletion, and state and local taxes on corporate income; inventory withdrawals are valued at current cost; and depreciation is on a consistent accounting basis and valued at current-replacement cost.
Coverage adjustments	Adjustments that are made to source data in order to account for NIPA definitions and concepts or for information that is not contained in the source data, either because the data were not collected or because the data were incomplete.
Current-cost	The valuing of an asset at the prices prevailing at the time the valuation is made. It incorporates the effects of both depreciation and the changes in the market prices of that type of asset. For example, the 2010 current-cost estimate for an asset is based on the price that would have been paid to acquire that asset in 2010, and the 2011 current-cost estimate for that asset is based on the price that would have been paid to acquire that asset in 2011.

Current-dollar estimates	Estimates valued in the prices of the period when the transactions occurred—that is, at "market value." Also referred to as "nominal estimates" or as "current-price estimates."
Current production	Production that takes place during the current period—that is, during the period being measured. In measuring GDP, the final sales recorded for product-side components—such as personal consumption expenditures—in the current period may include goods that were produced in earlier periods, so the recording of changes in inventories provides a means to allocate production to the period in which it actually occurred.
Current quarterly estimates	Three sets of NIPA estimates that provide initial pictures of U.S. economic activity for a given quarter. These estimates are released successively in the 3 months following the end of the quarter: the "advance" estimates are released near the end of the first month, the "second" estimates are released near the end of the second month, and the "third" estimates are released near the end of the third month.
Current surplus of government enterprises	Current operating revenue and subsidies received from other levels of government less current expenses, such as intermediate purchases and employee compensation. In this calculation, no deduction is made for net interest paid, because the interest payments of government enterprises are not separately identified from other government interest in the government receipts and expenditures account.
Current transfer payments (net)	Cash or in-kind transactions in which one of the parties receives nothing directly in return, such as unemployment benefits paid by government to persons. Excludes payments that are associated with the acquisition or disposal of fixed assets, such as estate taxes or gift taxes (see "capital transfers").
Defense	Portion of federal government consumption expenditures and gross investment that covers the military activities of the U.S. Department of Defense and the defense-related activities of other government agencies, such as certain atomic energy activities of the U.S. Department of Energy.
Deflation method	The most common method for preparing inflation-adjusted, or "quantity," estimates for most detailed NIPA components. In this method, the quantity estimate for a NIPA component is derived by dividing its current-dollar value by the value of an appropriate price index—that is, one whose definition and coverage most closely match those of the series being deflated.
Depletion	The reduction in the value of deposits of subsoil assets (such as minerals and oil) as a result of the physical removal and using up of the assets, and the reduction in the value of uncultivated biological assets (such as natural forests and fish stocks in the open seas) beyond sustainable levels of extraction. In the NIPAs, natural resource discoveries are not considered to be capital formation, so reductions in these resources are not treated as charges against current production.

Depreciation	The decline in the value of fixed assets due to physical deterioration, normal obsolescence, or accidental damage. In business accounting, depreciation is generally measured at historical cost, whereas in the NIPAs, the economic measure of depreciation, "consumption of fixed capital," is measured at current cost.
Direct investment	Investment in which a resident (in the legal sense, including a person or a company) of one country obtains a lasting interest in, and a significant degree of influence over, the management of a business enterprise in another country. In the United States and in the international statistical guidelines, the criterion used to define direct investment is ownership of at least 10 percent of the voting securities of an incorporated business enterprise or the equivalent interest in an unincorporated business enterprise.
Direct valuation method	Method for preparing inflation-adjusted, or "quantity," estimates for some detailed NIPA components, such as military aircraft. In this method, the quantity estimate for a NIPA component is derived by multiplying actual quantity data for the period being measured by the price of the component in the reference year.
Disposable personal income	The income available to persons for spending or saving. It is equal to personal income less personal current taxes.
Dividend income	A form of property income received by shareholders in return for their investment in the equity of a corporation.
Domestic capital account	Account 6 of the summary NIPAs. This account shows the relationship between saving and investment for the U.S. economy.
Domestic income and product account	Account 1 of the summary NIPAs. This account shows the production of all sectors of the U.S. economy. The right (product) side of the account shows GDP as the sum of final expenditures, and the left (income) side of the account shows GDP as the sum of the incomes earned and the costs incurred in that production.
"Domestic" measures	NIPA measures of economic activities that take place in the United States. For example, gross *domestic* product measures the value of final goods and services produced by labor and property in the United States.
Domestic supply	The amount of a commodity, valued at producers' prices, that is available for domestic consumption or fixed investment. It is calculated as domestic production plus imports less exports and less change in inventories.
Durable goods	Consists primarily of tangible products that can be stored or inventoried and that can be used repeatedly or continuously over a prolonged period. Also includes certain intangible products, such as software. See also "Consumer durable goods" and "Equipment."

Economic asset	See "Asset."
Economic Census	Mandatory census of economic activity that is conducted every 5 years by the Census Bureau. The basic statistics cover nearly all of the U.S. economy except agriculture and government, and those sectors are covered by concurrent censuses.
Employer contributions for employee pension and insurance funds	Consists of employer payments (including payments in kind) to private pension and profit-sharing plans, government employee retirement plans, private group health and life insurance plans, privately administered workers' compensation plans, and supplemental unemployment benefit plans.
Employer contributions for government social insurance	Consists of employer payments under the following federal government and state and local government programs: old-age, survivors, and disability insurance; hospital insurance; unemployment insurance; railroad retirement; pension benefit guaranty; veterans life insurance; publicly administered workers' compensation; military medical insurance; and temporary disability insurance.
Enterprise	A business, service, or membership organization consisting of one or more establishments under common, direct or indirect, ownership or control in its capacity as a producer of goods and services. An enterprise may vary in composition from a single-establishment company to a complex family of parent and subsidiary companies (or firms).
Equipment	Tangible fixed assets (such as new machinery, furniture, and vehicles)—whether purchased or produced for own use—that are used repeatedly, or continuously, in the processes of production for at least a year.
Establishment	An economic unit—business or industrial—at a single physical location where business is conducted or where services or industrial operations are performed. Examples include a factory, store, hotel, mine, farm, bank, railroad depot, sales office, warehouse, and central administrative office. A single establishment may be comprised of subunits, departments, or divisions, and one or more establishments make up an enterprise or a company.
Expenditures approach	The measure of GDP as the sum of goods and services purchased by final users—that is, personal consumption expenditures plus gross private domestic investment plus government consumption expenditures and gross investment plus exports of goods and services less imports of goods and services.
Exports of goods and services	Goods and services that are sold, given away, or otherwise transferred by U.S. residents to foreign residents.
Extrapolation	A method of extending the estimate for a NIPA component series from a given period forward (or backward) in time to other periods by using the movements of an indicator series or by using other statistical techniques to approximate the movements of the component series.

Final demand	The goods and services that are acquired by final users—persons, private businesses, governments, and foreigners.
Final expenditures components	The categories of expenditures by the final users of GDP: personal consumption expenditures, gross private domestic investment, government consumption expenditures and gross investment, and net exports (exports of goods and services less imports of goods and services).
Final product	The value of goods and services that are produced for final use. For the nation, total gross output less total intermediate product is equal to total final product (or GDP).
Final sales of domestic product	GDP less change in private inventories. It is also equal to the sum of personal consumption expenditures, gross private fixed investment, government consumption expenditures and gross investment, and net exports of goods and services.
Final sales to domestic purchasers	Gross domestic purchases less change in private inventories. It is also equal to the sum of personal consumption expenditures, gross private fixed investment, and government consumption expenditures and gross investment.
Final sales to private domestic purchasers	Final sales to domestic purchasers less government consumption expenditures and gross investment. It is also equal to the sum of personal consumption expenditures and gross private fixed investment.
Final users	The ultimate consumers of the final products (goods and services) that are produced by the economy. The final users consist of persons (personal consumption expenditures), private businesses (gross private domestic investment), governments (federal and state and local consumption expenditures and gross investment), and foreigners (net exports of goods and services).
Financial accounts of the United States	Part of the U.S. system of national economic accounts. The financial accounts of the United States, prepared by the U.S. Board of Governors of the Federal Reserve System, record the acquisition of assets throughout the U.S. economy, document the sources of the funds used to acquire those assets, and measure the value of total assets and liabilities. Formerly known as the "flow of funds accounts."
Financial assets	Consists of all financial claims, shares, and other equity in corporations plus gold bullion held by monetary authorities as a reserve asset.
Financial industries	NIPA industry classification that consists of the North American Industry Classification System (NAICS) industry "finance and insurance" and of bank and other holding companies in the NAICS industry "management of companies and enterprises."

Fisher index	Quantity or price index for an aggregate that is computed as the geometric mean of the corresponding Laspeyres and Paasche quantity or price indexes for that aggregate. One characteristic of these indexes is that the Fisher quantity index for an aggregate multiplied by the Fisher price index for that aggregate equals the relative change in current-dollar expenditures—that is, the ratio of the expenditures of the current period to the expenditures of the previous period. In the NIPAs, percent changes in quantities and prices are computed from chain-type indexes that are calculated using a Fisher formula.
Fixed assets	Produced assets that are used repeatedly, or continuously, in the process of production for more than 1 year. They consist of structures, equipment, and intellectual property products that are owned by private businesses, by nonprofit institutions, by households, and by governments.
Fixed assets and consumer durable goods accounts	Economic accounts prepared by BEA that present estimates (1) of the net stock of fixed assets owned by private businesses and by governments and of the net stock of consumer durable goods owned by households, (2) of the depreciation of those assets, and (3) of the investment flows associated with those assets.
Fixed-weighted index	An index in which the base-period weights are taken from a designated base period and do not change over time. See "Laspeyres index" and "Paasche index."
Flow of funds accounts	See "Financial accounts of the United States."
Foreign direct investment in the United States	Represents the ownership or control, directly or indirectly, by one foreign resident of at least 10 percent of a U.S. business enterprise (see also "Direct investment").

Foreign residents	Comprises (1) individuals residing permanently outside of the United States, (2) business enterprises and nonprofit organizations established under the laws of foreign nations; (3) foreign governments, together with their subdivisions, and (4) international organizations located in the United States. Includes individuals who reside or expect to reside abroad for 1 year or more. Exceptions are made for U.S. students who study abroad, for U.S. residents who travel abroad for medical treatment, and for foreign nationals working at international organizations in the United States, all of which are considered U.S. residents regardless of their length of stay. Similarly, foreign government employees (and their families) stationed in the United States—such as diplomats, consular officials, and members of the armed forces—are considered foreign residents regardless of their length of stay. Affiliates of multinational corporations are considered residents of the country in which they are located, not residents of the country of their parent; thus, foreign affiliates of U.S. corporations are considered foreign residents. In the NIPAs, the *"rest of the world"* sector consists of foreign residents who are transactors with U.S. residents. The NIPA definition is consistent with the definition of foreign residents in the international transactions accounts (ITAs), but in the NIPAs, residents of the U.S. territories, Puerto Rico, the Northern Mariana Islands are treated as foreign residents while in the ITAs, they are treated as U.S. residents (see "Territorial adjustment"). Also referred to as "Nonresidents."
Foreign transactions capital account	Account 7 of the summary NIPAs. This account presents information on transactions with foreigners involving the acquisition or disposition of nonproduced nonfinancial assets and on capital transfers.
Foreign transactions current account	Account 5 of the summary NIPAs. This account presents information on exports and imports associated with foreign trade, income receipts and payments, and current taxes and other transfer payments. This account does not include transactions involving the acquisition or disposition of nonproduced nonfinancial assets nor capital transfers, which are shown in the foreign transactions capital account, nor does it include transactions in financial assets and liabilities.
Frequency	The time unit covered by an economic statistic. For example, *monthly* surveys of retail trade, *quarterly* estimates of GDP, or *annual* input-output accounts.
General government sector	Comprises all federal government and state and local government agencies except government enterprises. Economic activities of general government agencies include the production of nonmarket services (such as public safety and national defense), the collection of revenues, and the provision or distribution of social benefits, as well as general legislation and regulation.

Goods	Consists primarily of tangible products that can be stored or inventoried. Also includes certain intangible assets (software, research and development, and entertainment, literary, and artistic originals), which are classified as intellectual property products.
Goods-producing industries	NIPA classification that consists of the following NAICS sectors: agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
Government consumption expenditures and gross investment	The government component of final demand in the NIPAs. It comprises two components: (1) government consumption expenditures, which consists of spending by general government to produce and provide services to the public; and (2) government gross investment, which consists of spending by both general government and government enterprises for fixed assets that benefit the public or that are used by government agencies in their production activities. It excludes government spending for social benefits, grants, and subsidies.
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. Examples are the U.S. Postal Service and public water and sewage agencies.
Government receipts and expenditures	Account 4 of the summary NIPAs. This account summarizes the combined transactions of federal, state, and local governments.
Gross capital formation	See "Gross domestic investment."
Gross domestic income (GDI)	The value of the incomes earned and costs incurred in the production of goods, services, and structures in the nation's economy. GDI is equal to the sum of compensation of employees, taxes on production and imports less subsidies, net operating surplus, and consumption of fixed capital. In theory GDI should equal GDP, 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."
Gross domestic fixed investment	Gross private fixed investment plus gross government fixed investment.
Gross domestic investment	Gross private domestic investment plus gross government fixed investment. Also equal to gross domestic fixed investment plus change in private inventories.
Gross domestic product (GDP)	BEA's featured measure of U.S. production. GDP is the market value of the goods, services, and structures produced by the nation's economy in a particular period less the value of the goods and services used up in production. GDP is calculated as the sum of personal consumption expenditures, gross private domestic investment, net exports of goods and services, and government consumption expenditures and gross investment. GDP is also equal to the sum of value added by industry across all industries.

Gross domestic product (GDP) by industry	GDP by industry measures the contribution of each private industry and of government to the nation's output, or GDP. An industry's GDP, or its "value added," is equal to its gross output minus its intermediate inputs.
Gross domestic product (GDP) by industry accounts	Part of BEA's annual industry accounts. The GDP-by-industry accounts, prepared by BEA, provide estimates of value added—gross output minus intermediate inputs—and the composition of value added for private industry and for government.
Gross domestic product (GDP) by metropolitan area	Part of BEA's regional economic accounts, these estimates are the local area counterpart of the nation's GDP. The estimates are computed by applying the state ratio of GDP to earnings by place of work to local estimates of earnings by place of work.
Gross domestic product (GDP) by state	Part of BEA's regional economic accounts, these estimates are the state counterpart of the nation's GDP. For each state, an estimate of value added is calculated for each industry as the sum of the incomes earned by labor and capital and the costs incurred in the production of goods and services.
Gross domestic product (GDP) price index	NIPA index that measures the prices of final goods and services produced by the U.S. economy. It is derived from the prices of personal consumption expenditures, gross private domestic investment, net exports, and government consumption expenditures and gross investment. It differs from the gross domestic purchases price index in that it excludes the prices of goods and services that were produced abroad and sold in the United States (imports), and it includes the prices of goods and services that were produced in the United States and sold abroad (exports).
Gross domestic purchases	The market value of final goods and services purchased by U.S. residents, regardless of where those goods and services were produced. Gross domestic purchases is equal to GDP less net exports of goods and services. It is also equal to the sum of personal consumption expenditures, gross private domestic investment, and government consumption expenditures and gross investment.
Gross domestic purchases price index	BEA's featured measure of price change in the U.S. economy is the percent change in this index. This index measures the prices of final goods and services purchased by U.S. residents. It is derived from the prices of personal consumption expenditures, gross private domestic investment, and government consumption expenditures and gross investment. It differs from the GDP price index in that it excludes the prices of exports of goods and services, and it includes the prices of imports of goods and services.
Gross fixed capital	See "Gross domestic fixed investment."

Gross national income (GNI)	The sum of incomes earned and costs incurred in production by labor and property supplied by U.S. residents. It is equal to gross domestic income plus income receipts from the rest of the world less income payments to the rest of the world. It is also equal to gross national product less the statistical discrepancy.
Gross national product (GNP)	The market value of the goods, services, and structures produced by labor and property supplied by U.S. residents. GNP is equal to GDP plus income receipts from the rest of the world less income payments to the rest of the world, and it is conceptually equivalent to gross national income (though it is estimated using different source data).
Gross operating surplus	A profits-like measure that shows gross private and government enterprise income after subtracting compensation of employees and "taxes on production and imports less subsidies" from gross value added, but before subtracting consumption of fixed capital, financing costs (such as net interest), and other payments (such as business current transfer payments). It is equal to net operating surplus plus consumption of fixed capital.
Gross output	The value of goods and services produced by the nation's economy, principally measured using industry sales or receipts, including sales to final users (GDP) and sales to other industries (intermediate inputs).
Gross private domestic investment	The private-investment component of final demand in the NIPAs. It comprises gross private fixed investment and change in private inventories.
Gross private fixed investment	Component of gross private domestic investment that measures additions and replacements to the stock of private fixed assets without deducting depreciation. It consists of two components: nonresidential fixed investment and residential fixed investment.
Gross saving	A measure of the saving that is available to support the nation's stock of fixed assets. It is equal to the sum of personal saving, undistributed corporate profits with inventory valuation and capital consumption adjustments, net government saving, and consumption of fixed capital. It is also equal to gross national income less the sum of personal consumption expenditures, government consumption expenditures, and current taxes and transfer payments to the rest of the world.
Historical cost	The valuing of an asset at the prices prevailing at the time when it was acquired.
Holding gains or losses	See "Capital gains or losses."

Households and institutions sector	Consists of households (families and unrelated individuals) and of nonprofit institutions that primarily serve households. The economic activities of households that are included in this sector are the services of owner-occupied housing and the compensation of domestic workers. Other market-oriented household activities, such as sole proprietorships and rental of tenant-occupied housing, are treated in the NIPAs as noncorporate business in the business sector.
Implicit price deflator (IPD)	A NIPA price measure that is derived by dividing the current-dollar value of an aggregate or component by its corresponding chained-dollar value, and then multiplying by 100. For all periods, the values of the IPD are very close to the values of the corresponding chain-type price index.
Imports of goods and services	Goods and services that are sold, given away, or otherwise transferred by foreign residents to U.S. residents.
Imputation	An estimation of the dollar value of certain economic transactions where market prices do not fully reflect the value of the transaction or where the service is provided without a monetary exchange. In the NIPAs, the largest imputations are for the rental value of owner-occupied housing, where the provision for housing services to the occupant does not involve an exchange between transactors, and for services provided by banks and other financial institutions without an explicit charge.
Income and outlay account	An economic account that records the sources of income for an economy, sector, or other economic entity, its current outlays, and its saving.
Income approach	The measurement of GDP as the sum of income payments and other costs incurred in the production of final goods and services—that is, compensation of employees plus "taxes on production and imports less subsidies" plus net operating surplus plus consumption of fixed capital.
Income payments on assets	In the private enterprise income account, payments to the owners of assets for their use by others—that is, interest and miscellaneous payments, dividend payments to the rest of the world, and reinvested earnings on foreign direct investment in the United States.
Income payments to the rest of the world	In the foreign transactions current account, consists of wage and salary payments and of income payments on assets (the sum of interest and miscellaneous payments, dividend payments, and reinvested earnings on foreign direct investment in the United States).
Income receipts from the rest of the world	In the foreign transactions current account, consists of wage and salary receipts and of income receipts on assets (the sum of interest and miscellaneous receipts, dividend receipts, and reinvested earnings on U.S. direct investment abroad).

Income receipts on assets	In the private enterprise income account, receipts by the owners of assets for their use by others—that is, interest and miscellaneous receipts, dividend receipts from the rest of the world, and reinvested earnings on U.S. direct investment abroad.
Indicator series	A series whose movements are used to approximate the movements of a given NIPA component series. In general, an indicator series is available sooner or more frequently than the component series but is based on less comprehensive source data.
Industry	A group of establishments or companies that are engaged in the same or similar types of economic activity. In the U.S. statistical system, establishments are classified into industries based on the North American Industry Classification System.
Industry economic accounts	Part of the U.S. system of national economic accounts. The industry accounts, prepared by BEA, include the annual industry accounts, the benchmark input-output accounts, and the travel and tourism satellite accounts for the United States.
Input-output (I-O) tables	A set of make, use, and supplementary tables that trace the flow of goods and services among industries in the production process, show the value added by each industry, and provide the detailed commodity composition of national output. See also "Annual I-O accounts" and "Benchmark I-O accounts."
Institutional unit	An economic entity (such as a business, household, or local government) that is capable, in its own right, of owning assets, incurring liabilities, and in engaging in economic activities and in transactions with other entities.
Intellectual property products	Intangible fixed assets—whether purchased or produced for own use—that are used repeatedly, or continuously, in the processes of production for at least a year. In the NIPAs, these products consist of software, of research and development, and of entertainment, literary, and artistic originals. (For practical reasons, the NIPAs include mineral exploration within its estimates of nonresidential structures, even though the output of mineral exploration can be considered to be an intellectual property product.)
Interest income	A form of property income received by the owners of certain kinds of financial assets (such as deposits, debt securities, and loans) in return for their investment in those assets.

Intermediate inputs	Goods and services—such as energy, materials, and purchased services—that are used for the production of other goods and services rather than for final consumption. Intermediate inputs do not include the inputs from the primary factors of production (capital and labor) that are components of value added. Also referred to as "Intermediate products."
Intermediate products	See "Intermediate inputs."
International economic accounts	Prepared by BEA, these accounts include the international transactions accounts and the international investment position accounts.
International investment position accounts (IIPs)	Part of BEA's international economic accounts, the IIP accounts summarize the value of accumulated stocks of U.S.-owned assets abroad and of foreign-owned assets in the United States. The difference between the assets and liabilities is the net IIP of the United States. Separate statistics are available for the value of accumulated stocks of official assets, of U.S. government assets other than official reserve assets, of direct, portfolio, and other investment, and of financial derivatives.
International transactions accounts (ITAs)	Part of BEA's international economic accounts, the ITAs summarize transactions between U.S. residents and foreign residents. The ITAs consist of three accounts: the current account records trade in goods and services, receipts and payments of income, and current transfers; the capital account records capital transfers, such as debt forgiveness and the acquisition or disposition of nonproduced nonfinancial assets; and the financial account records transactions for official assets, for U.S. government assets other than official reserve assets, for direct, portfolio, and other investment, and on a net basis, transactions for financial derivatives. Also referred to as "Balance of payments accounts."
Interpolation	A method of filling in estimates for a NIPA component series between two time periods by using the movements of an indicator series or by using other statistical techniques to approximate the movements of the component series. For example, an annual survey, (such as the Census Bureau annual retail trade survey) may be used to derive the annual estimate for a component series, and a monthly survey (such as the Census Bureau monthly retail trade survey) is used to derive the intervening monthly and quarterly estimates while maintaining consistency with the more accurate annual source data.
Inventories	Stocks of goods held by a firm. Inventories consist of (1) materials and supplies held for use in the production of goods for sale or in the provision of a service, (2) "work-in-progress" products that are partly processed and that require further processing prior to sale, (3) finished goods held for sale, and (4) products purchased for resale, generally held by wholesalers and retailers.

Inventory valuation adjustment (IVA)	An adjustment that is made to the NIPA estimates of change in private inventories and of corporate profits and proprietors' income so that they are valued consistently in current prices. The IVA accounts for the difference between the acquisition and the withdrawal value of inventories in certain methods of business accounting, which may arise when the price of a good changes while the good is held in inventory. A negative (positive) IVA represents gains (losses) to the business that are attributable to holding inventories rather than to current production. A corresponding adjustment is made to the estimates of corporate profits and of proprietors' income so that these incomes are associated with current production.
Kind of business (KB)	Term used by the Census Bureau to describe the industry classification of an establishment on the basis of its major activity.
Laspeyres index	A quantity or price index for an aggregate in which the formula weights are taken from a designated base period and do not change over time. For example, in computing a Laspeyres quantity index, the quantities in each time period are multiplied by the base-period prices. Laspeyres indexes are relatively easy to compute and analyze, but they do not capture substitutions between items over time, and their movements are highly dependent on the choice of the base period.
Legal form of organization	System that is used to classify the NIPA measures of national income and its components by the type of income recipient. This system is largely based on the criteria used by the Internal Revenue Service to determine the tax-filing requirements for corporate business and for noncorporate business. (See also "corporate business" and "noncorporate business.")
Local area personal income	Part of BEA's regional economic accounts, these estimates measure the income received by, or on the behalf of, the residents of a county, metropolitan statistical area, micropolitan statistical area, combined statistical area, metropolitan division, or BEA economic area. Estimates are prepared by place of work and by place of residence.
Manufacturers' sales branches (MSBs)	One of several types of wholesalers, MSBs hold inventories and primarily sell products manufactured or mined in the United States by their parent companies.
Manufacturers' sales offices (MSOs)	One of several types of wholesalers, MSOs do not hold inventories and primarily act as agents to sell products manufactured or mined in the United States by their parent companies.

Margin	The value added by wholesalers and retailers in the chain of distribution of a commodity from the producer to the final purchaser. Sometimes referred to as "markup" or "trade markup."
Market-based personal consumption expenditures (PCE) price index	A supplemental PCE price measure that is based on household expenditures for which there are observable price measures (primarily consumer price indexes and producer price indexes). It excludes most implicit prices (for example, financial services furnished without payment) and the final consumption expenditures of nonprofit institutions serving households.
Market production	Production of goods and services that are produced for sale at prices that are "economically significant"—that is, at prices that have a significant influence on the amounts that producers are willing to supply and that purchasers are willing to buy.
Merchant wholesalers	Wholesalers that sell goods on their own account—that is, they buy the goods, usually maintain them in warehouses, and then resell them. Under the North American Industry Classification System, merchant wholesalers include sales offices and sales branches that are maintained by manufacturing, refining, or mining enterprises apart from their factories or mines for the purpose of marketing their products.
Misreporting adjustment	See "Tax misreporting adjustment."
National economic accounts	A system of accounts that organizes economic information in a way that describes the economic activities of a nation. The U.S. national economic accounts consist of the NIPAs and the industry economic accounts, both of which are prepared by BEA, and the financial accounts of the United States, which are prepared by the Federal Reserve Board. The accounting concepts and principles are generally based on international guidelines set forth in the SNA. Related accounts include BEA's international economic accounts and regional economic accounts.
National income	The sum of all net incomes (net of consumption of fixed capital) earned in current production. It is equal to gross national income less consumption of fixed capital, to net national product less the statistical discrepancy, and to net domestic income plus income receipts from the rest of the world less income payments to the rest of the world. National income comprises 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, net interest and miscellaneous payments on assets, taxes on production and imports less subsidies, business current transfer payments (net), and current surplus of government enterprises. National income may also be referred to as "net national income."

National income and product accounts (NIPAs)	Part of the U.S. system of national economic accounts. The NIPAs, prepared by BEA, display the value and composition of U.S. production, the distribution of incomes generated in producing it, and the sources of saving, which provides for investment in future production.
"National" measures	NIPA measures of economic income earned and activities that are attributable to labor and capital supplied by U.S. residents, wherever the activity is located. For example, gross *national* product measures the value of final goods and services produced by labor and property supplied by U.S. residents and gross *national* income measures the income earned by U.S. residents from those activities.
Net domestic income (NDI)	The sum of net incomes earned and costs incurred in the production of net domestic product. It is equal to gross domestic income less consumption of fixed capital, and it is also equal to net domestic product less the statistical discrepancy. NDI comprises compensation of employees, taxes on production and imports less subsidies, and net operating surplus.
Net domestic product (NDP)	The market value of the final goods and services produced by labor and capital in the United States, less consumption of fixed capital. NDP is equal to GDP less consumption of fixed capital. It 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 exports of goods and services	The net foreign component of final demand in the NIPAs. It is calculated as exports of goods and services less imports of goods and services.
Net interest	Interest paid by private enterprises less interest received by private enterprises, plus interest paid by the rest of the world less interest received by the rest of the world.
Net lending or net borrowing, NIPAs	The NIPA balance on current account less net capital transfers to the rest of the world. It may be viewed as an indirect measure of the net acquisition of foreign assets by U.S. residents less the net acquisition of U.S. assets by foreign residents.Net lending or net borrowing is also calculated for each of the major sectors (private domestic business, households and institutions, federal government, and state and local government), where it represents the funds available for the acquisition of financial assets or the borrowing needs of that sector.
Net national income (NNI)	See "National income."
Net national product (NNP)	The market value of final goods and services produced by labor and property supplied by U.S. residents, less consumption of fixed capital. NNP is equal to gross national product less consumption of fixed capital. It is also equal to net domestic product plus income receipts from the rest of the world less income payments to the rest of the world.

Net operating surplus	A profits-like measure of the surplus accruing to private and government enterprises from the processes of production before deduction any explicit or implicit interest charges, rent, or other property incomes payable on financial assets, land, or other natural resources required to carry out production. It is equal to gross operating surplus less consumption of fixed capital.
Net saving	A measure of the saving that is available for adding to the nation's net stock of fixed assets or for lending to the rest of the world. It is equal to the sum of personal saving, undistributed corporate profits with inventory valuation and capital consumption adjustments, and net government saving.
Nominal estimates	See "Current-dollar estimates."
Noncorporate business	In classification by legal form of organization in the NIPAs, noncorporate business comprises sole proprietorships and partnerships, "other" private business, and government enterprises.
Nondefense	Portion of federal government consumption expenditures and gross investment that covers activities other than the military activities of the U.S. Department of Defense and the defense-related activities of other government agencies.
Nondurable goods	Tangible products that can be stored or inventoried and that are usable over a relatively short period.
Nonfinancial industries	NIPA industry classification that consists of all private industries except those that are classified in the North American Industry Classification System (NAICS) as "financial industries," which consists of the NAICS industry "finance and insurance" and of bank and other holding companies in the NAICS industry "management of companies and enterprises."
Nonmarket production	In national economic accounting, production of goods and services that are provided free of charge or for prices that do not significantly influence the amounts that producers supply or that purchasers demand. In the NIPAs, most of the production of nonprofit institutions and of government agencies is nonmarket production. In addition, the term "nonmarket production" is sometimes used to refer to production activities that are outside the scope of the national economic accounts, such as unpaid household work and volunteer labor (see "Production boundary").
Nonproduced assets	Nonfinancial assets that are used for production but were not themselves produced. They include naturally occurring assets, such as land and mineral deposits.

Nonprofit institutions serving households (NPISHs)	Private organizations with tax-exempt status that primarily provide services to households in one of the following categories: religious and welfare (including social services, grant-making foundations, political organizations, museums and libraries, and some civic and fraternal organizations); medical care; education and research; recreation (including cultural, athletic, and some civic and fraternal organizations); and personal business (including labor unions, legal aid, and professional associations). Does not include nonprofit institutions that primarily serve business.
Nonresidential equipment	Component of nonresidential fixed investment that consists of tangible products other than structures—such as new machinery, furniture, and vehicles—whether purchased or produced for own use. Also includes dealers' margins on sales of used equipment and net purchases of used equipment between sectors of the economy.
Nonresidential fixed investment	Component of gross private fixed investment that measures investment by businesses and nonprofit institutions in nonresidential structures, equipment, and intellectual property products.
Nonresidential intellectual property products	Component of nonresidential fixed investment that consists of intangible products—whether purchased or produced for own use. In the NIPAs, these products consist of software, of research and development, and of entertainment, literary, and artistic originals.
Nonresidential structures	Component of nonresidential fixed investment that measures new construction (including own-account investment), improvements to existing structures, expenditures on new nonresidential mobile structures, brokers' commissions on sale of structures, mineral exploration, and net purchases of used structures by private business and by nonprofit institutions from government agencies. Also includes equipment that is considered to be an integral part of a structure, such as plumbing, HVAC, and electrical systems.
Nonresidents	See "Foreign residents."
North American Industry Classification System (NAICS)	A comprehensive, industrial classification system—developed and used by the United States, Canada, and Mexico—that groups establishments according to the similarity of their production processes. NAICS is the primary industrial classification used for the NIPA estimates of private inventories beginning in 1998 and for the NIPA estimates of income by industry beginning in 2001. Estimates for the earlier periods are based on the Standard Industrial Classification (SIC) system (see "Standard Industrial Classification System").
North American Product Classification System (NAPCS)	A comprehensive, demand-oriented product classification system that is being developed by the United States, Canada, and Mexico as a complement to NAICS.

Not seasonally adjusted	Time series that have not been adjusted to remove the effects of seasonality. The NIPAs provide estimates of GDP, GDI, and their major components that are not seasonally adjusted. See "residual seasonality," and "seasonal adjustment," and "seasonality."
"Other" private business	In classification by legal form of organization in the NIPAs, "other" private business comprises tax-exempt cooperatives and all entities that are (or would be) required to report rental and royalty income on IRS Schedule E (Supplemental Income and Loss) of the individual income tax return.
Own-account investment	A form of production in which establishments produce fixed assets for themselves rather than purchasing them from another establishment. For example, a business engages in own-account investment if it develops or improves its own software rather than purchasing custom-made software from a software-development company. Formerly termed "force- account" investment.
Owner-occupied housing	A NIPA imputation that approximates the value of housing services provided to occupants who own their homes. This imputation is made so that the treatment of owner-occupied housing is comparable to that for tenant-occupied housing (which is valued by rent paid).
Paasche index	A quantity or price index for an aggregate in which the formula weights are taken from the current or more recent time period. Thus, in computing a Paasche quantity index, the quantities in each time period are multiplied by the current-period prices.
Partnerships	In classification by legal form of organization in the NIPAs, partnerships comprises all entities that are required to file federal partnership income tax returns, IRS Form 1065 (U.S. Return of Partnership Income).
Perpetual-inventory method	A method used by BEA to prepare estimates of the net stock of fixed assets, which, in turn, are used in deriving the NIPA estimates of consumption of fixed capital. For each type of asset, the net stock in each year is calculated as the cumulative value of gross investment through that year less the cumulative value of depreciation through that year. A variation of this method that omits depreciation is used to derive the stocks of private inventories.
Personal consumption expenditures (PCE)	Primary measure of consumer spending in the U.S. economy. It is the NIPA final-demand component that measures the value of the goods and services purchased by, or on the behalf of, "persons" who reside in the United States.
Personal consumption expenditures (PCE) price index	NIPA index that measures the prices paid for the goods and services purchased by, or on the behalf of, "persons."

Personal current taxes	Tax payments (net of refunds) by persons that are not chargeable to business expense and certain other payments that are made by persons to government agencies other than government enterprises. These taxes primarily consist of taxes on income, including realized capital gains, and on personal property. They do not include personal contributions for government social insurance.
Personal current transfer receipts	Payments by business and government to persons for which no current services are performed. Business current transfer payments include liability payments for personal injury and corporate gifts to nonprofit institutions. Government current transfer payments include social security benefits, medical benefits, veterans' benefits, and unemployment insurance benefits.
Personal income	The income that persons receive in return for their provision of labor, land, and capital used in current production, plus current transfer receipts less contributions for government social insurance (domestic). Personal income arising from current production consists of compensation of employees, proprietors' income with inventory valuation adjustment and capital consumption adjustment (CCAdj), rental income of persons with CCAdj, and personal income receipts on assets (personal interest income and personal dividend income).
Personal income and outlay	Account 3 of the summary NIPAs. This account shows the sources and uses of income received by persons.
Personal outlays	The sum of personal consumption expenditures, personal interest payments (excluding mortgage interest payments), and personal current transfer payments to government (including donations, fees, and fines) and to the rest of the world (net remittances in cash and in kind).
Personal saving	Personal income less personal outlays and personal current taxes.
Principal economic indicators	Certain major federal statistical series that are so designated by the U.S. Office of Management and Budget (OMB) and that are subject to the procedures established in OMB Statistical Policy Directive No. 3, which establishes rules governing the release of data, pre-release access to the data, public announcement of changes in methodology, and periodic evaluation of data accuracy. BEA's estimates of GDP, personal income and outlays, corporate profits, international transactions, and international trade in goods and services (jointly with the Census Bureau) are among the principal economic indicators.

Private business	Comprises all corporate and noncorporate private entities organized for profit, other entities that produce goods and services for sale at a price that is based on the costs of production, and certain other entities that are treated as businesses in the NIPAs. Other entities include mutual financial institutions, private noninsured pension plans, cooperatives, nonprofit organizations that primarily serve business, federal reserve banks, and federally sponsored credit agencies.
Private enterprise	Consists of private business, the activities of households and institutions that are included within the production boundary of the NIPAs (primarily the services of owner-occupied housing), and, for the purpose of estimating monetary and imputed interest payments and receipts, nonprofit institutions serving households.
Private enterprise income account	Account 2 of the summary NIPAs. This account provides information on the sources and uses of the income of private businesses and other private enterprises.
Produced assets	Nonfinancial assets that have come into existence as a result of a production process that is included in the production boundary. The NIPAs recognize two types of produced assets: fixed assets and inventories. The SNA includes a third type, valuables that are held as stores of value (such as precious metals), which are not treated as assets in the NIPAs.
Producers' prices	The prices received by producers for the goods and services that they sell. These prices include sales and excise taxes but exclude domestic transportation costs and trade margins.
Production account	Economic account that records the value of production, or value added, by the economy, sector, or other economic entity and the uses of the income arising from that production.
Production boundary	Boundary that defines what is considered to be production in an accounting system. In the NIPAs, the boundary includes the production of most goods and services for the market, the production of goods or fixed assets by producers for their own final use as consumption or as fixed investment, and certain nonmarket activities, such as the provision of most goods and services by government agencies and by nonprofit institutions, and the production of housing services by owner-occupied housing. It excludes other nonmarket activities such as unpaid household work, volunteer work, and the natural growth of forests.
Product line	Term used by the Census Bureau to identify the types of products that are produced or sold. Beginning with the 2002 Economic Census, this term replaced "merchandise line" for retail sales, "commodity line" for wholesale sales, and "revenue line" for services.
Property income	See "Income receipts on assets" and "Income payments on assets."

Proprietors' income with IVA and CCAdj	The current-production income (including income in kind) of sole proprietorships and partnerships and of tax-exempt cooperatives. It excludes dividends and monetary interest received by nonfinancial proprietorships and partnerships (which is considered received by persons) and rental income of persons not primarily engaged in the real estate business. In the NIPAs, estimates are prepared separately for farm and nonfarm proprietors.
Public corporations	See "Government enterprises."
Purchasers' prices	The prices paid by intermediate and final purchasers for the goods and services that they buy. These prices are equal to producers' prices plus domestic transportation costs and trade margins.
Quantity estimates	Inflation-adjusted estimates—that is, estimates that exclude the effects of price changes. For individual goods and services, quantity estimates are derived using the deflation method, the quantity extrapolation method, or the direct valuation method. For aggregate series, quantity estimates are based on chain-type quantity indexes, which are also be presented as chained-dollar estimates (see "Chain-type indexes" and "Chained-dollar estimates"). Also referred to as "real" estimates.
Quantity extrapolation method	Method for preparing inflation-adjusted, or "quantity," estimates for some detailed NIPA components, such as, for example, compensation of state and local government employees. In this method, the quantity estimate for a NIPA component is derived by multiplying the base-year value of the component by a quantity indicator series that is set equal to 1 in the reference year.
Quantity index	A weighted average of the proportionate changes in the quantities of a set of goods or services between two periods of time. Quantity indexes for adjacent pairs of periods can be "chained" (multiplied) together to form chain-type quantity indexes (see "Chain-type indexes).
Real disposable personal income	Inflation-adjusted measure of disposable personal income that is calculated by deflation using the personal consumption expenditure price index as the deflator.
Real estimates	See "Quantity estimates."
Real gross domestic income (Real GDI)	A NIPA alternative measure of changes in U.S. production relative to the reference year, adjusted for inflation. It is calculated by deflating gross domestic income (the sum of incomes earned and costs incurred in the production of GDP) using the GDP price index as the deflator, and thus it is conceptually equivalent to real GDP. In contrast, in the SNA, real GDI is a measure of the purchasing power of the total incomes generated by domestic production, adjusting for changes in the terms of trade; in the NIPAs, this measure is termed "command-basis GDP."

Real gross domestic product (Real GDP)	BEA's featured measure of domestic production. It measures U.S. production relative to the reference year, adjusted for inflation. It is calculated as a chain-type quantity index and is also presented in chained dollars.
Reference period	In the derivation of quantity or price estimates, the period (usually a year) for which an index is set equal to 100, and a real value is set equal to the current-dollar value.
Regional economic accounts	Prepared by BEA, these accounts consist of the estimates of GDP by state and by metropolitan area and of personal income by state and by local area.
Rental income of persons with capital consumption adjustment	The net 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 dwellings, and the royalties received by persons from patents, copyrights, and rights to natural resources.
Residential equipment	Component of residential fixed investment that consists of equipment (such as furniture and household appliances) that is purchased by landlords and included in the rental to tenants.
Residential fixed	Component of gross private fixed investment that covers all private residential structures and residential equipment.
Residential structures	Component of residential fixed investment that consists of new construction of permanent-site single-family and multifamily units (excluding land), improvements (additions, alterations, and major structural replacements) to housing units, expenditures on manufactured homes, ownership transfer costs (including brokers' commissions on the sale of residential property), and net purchases of used structures from government agencies. Residential structures also includes some types of equipment that are built into the structure (such as heating and air conditioning equipment).
Residual seasonality	Seasonality in a time series that exists even after the series has been adjusted to remove seasonal effects. See "seasonality" and "seasonal adjustment." Residual seasonality can be caused by inconsistencies arising from (1) the way monthly source data are utilized in the compilation of quarterly estimates, (2) revision policies and practices that prevent the most recent seasonal adjustments from being applied to historical time series, and (3) transformations of the adjusted series—such as aggregation, interpolation, or deflation—that are necessary to derive the NIPA estimates.
Rest-of-the-world sector	Consists of foreign residents who conduct transactions with U.S. residents.

Retail control method	A method used by BEA to prepare nonbenchmark-year and quarterly estimates for most components of personal consumption expenditures (PCE) for goods. The retail control method provides the indicator series that are used in interpolating and extrapolating the estimates for most PCE goods components, and it provides the aggregate indicator of the period-to-period change for this group of components. In this method, data on sales by kind of business from annual and monthly retail trade surveys are allocated among these PCE categories (known as the PCE control group) based on product-line data from the economic census. The detailed component estimates are then scaled so that they aggregate to the PCE control group's period-to-period change.
Retail margin	The value added by retailers in the chain of distribution of a commodity from the producer to the final purchaser. Sometimes referred to as "retail markup."
Satellite accounts	Supplemental accounts that expand the analytical capacity of the main system of accounts by focusing on a particular aspect of economic activity. Satellite accounts are linked to the main accounts but have greater flexibility in providing more detailed information or in using alternative definitions, concepts, and accounting conventions. For example, BEA's travel and tourism satellite account provides detailed information on output, supply, demand, and employment for those industries.
Saving and investment account	See "Capital account."
Seasonality	Variation in a time series that occurs at about the same time and in about the same magnitude within each year as a result of recurring circumstances, such as weather or holidays. See "residual seasonality" and "seasonal adjustment."
Seasonal adjustment	Statistical adjustment of a time series that removes the average effect of variations that normally occur at about the same time and in about the same magnitude within each year—for example, the effects of weather or of holidays. After seasonal adjustment, trends, business cycles, and other movements in the time series stand out more clearly. See "seasonality" and "residual seasonality."
"Second" quarterly estimates	This vintage of the current quarterly NIPA estimates is released near the end of the second month that follows the end of the reference quarter. For most GDP components, the second estimate is based on source data for all 3 months of the quarter, some of which may have been revised since the "advance" estimate and some of which may still be subject to further revision.

Sector	Refers to a major subdivision of units in the economy. In the NIPAs, the term is used both (1) in the classification of institutional units and (2) in the classification of economic activities. (1) A group of institutional units that are similar in function, behavior, and objectives and whose accounts are consolidated to facilitate analysis. In the NIPAs, the three principal sectors for domestic production are business, households and institutions, and general government. (2) In the North American Industry Classification System (NAICS), one of 20 major areas of economic activity; the sectors are generally at the two-digit NAICS level (though manufacturing, retail, and transportation and warehousing span several two-digit codes).
Services	Products, such as medical care and transportation, that cannot be stored and that generally are consumed at the place and time of their purchase.
Services-producing industries	BEA classification that consists of the following North American Industry Classification System sectors: utilities; wholesale trade; retail trade; transportation and warehousing; information; finance and insurance; real estate and rental and leasing; professional, scientific, and technical services; management of companies and enterprises; administrative and waste management services; educational services; health care and social assistance; arts, entertainment, and recreation; accommodation and food services; and other services (except government).
Sole proprietorships	In classification by legal form of organization in the NIPAs, sole proprietorships comprises all entities that are required to file IRS Schedule C (Profit or Loss from Business) or Schedule F (Profit or Loss From Farming) or would be if the proprietor met the filing requirements.
Standard Industrial Classification (SIC)	Former U.S. system of industrial classification that groups establishments according to the similarity of their primary activity—that is, the principal product or group of products produced or distributed, or the principal services rendered. The SIC is the primary industrial classification used for the NIPA estimates of private inventories before 1998 and of income by industry before 2001. The North American Industry Classification System replaced the SIC as the primary industry classification system for the more recent period estimates (see "North American Industry Classification System").
State personal income	Part of BEA's regional economic accounts, these estimates measure the income received by, or on the behalf of, the residents of a state. Estimates are prepared by place of work and by place of residence.

Statistical discrepancy	The difference between the NIPA measure of production that is derived as the sum of final expenditures (GDP) and its counterpart measure that is derived as the sum of the costs incurred and the incomes earned in production (gross domestic income). The statistical discrepancy arises from the independent estimation of the two measures using different source data and methods. It is recorded in the NIPAs as an "income" component that reconciles the income side with the product side of the accounts.
Structures	Fixed assets, such as commercial buildings and highways, that are usually constructed at the location where they will be used and that typically have long economic lives.
Subsidies	Payments from government agencies to private business (for example, federal subsidies to farmers) and to government enterprises (for example, federal subsidies to state and local public housing authorities) to support their current operations. In contrast, payments associated with the acquisition or disposal of assets are classified as capital transfers.
Supplements to wages and salaries	Consists of employer contributions for employee pension and insurance funds and of employer contributions for government social insurance.
Survey of Current Business	BEA's monthly journal of record. Articles in the *Survey* present the latest national, international, regional, and industry estimates; describe the methodologies used to prepare the estimates; provide information about revisions; and discuss on-going research.
System of National Accounts (SNA)	An international set of guidelines for a system of economic accounts, published by the Commission for the European Communities, the International Monetary Fund, the Organisation for Economic Co- operation and Development, the United Nations, and the World Bank. The SNA organizes information about the flows and stocks that describe an economy within a comprehensive, integrated framework. The SNA provides the general accounting framework for the national economic accounts for the United States and other countries. The most recent edition of the SNA was published in 2008.
Taxes on production and imports	Taxes payable on products when they are produced, delivered, sold, transferred, or otherwise disposed of by their producers (such as federal excise taxes, custom duties, and state and local sales taxes). Also includes other taxes on production, such as taxes on ownership of assets used in production (for example, local real estate taxes, motor vehicle licenses, severance taxes, and special assessments). Does not include personal and corporate income taxes and personal property taxes.
Tax-exempt cooperative	A nonprofit business organization that is collectively owned by its members. In the NIPAs, these organizations are classified in the "other" private business sector, and their income is classified as proprietors' income.

Tax misreporting	An adjustment made by BEA to IRS tax-return data in order to account for underreported income or for illegal nonfiling of tax returns.
Terms of trade	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 calculated as the ratio of the price index for exports of goods and services to the price index for imports of goods and services. Ratios for the terms of trade in goods and in nonpetroleum goods are also prepared.
"Third" quarterly estimates	This vintage of the current quarterly NIPA estimates is released near the end of the third month that follows the end of the reference quarter. These estimates incorporate any revisions to the monthly source data since the "second" quarterly estimate and newly available quarterly source data. With the exception of wages and salaries and income aggregates related to it, these estimates will not be revised again until the next annual or comprehensive update of the NIPAs.
Territorial adjustment	An adjustment that is made to the international transactions accounts (ITAs) to make the geographical coverage consistent with that of the NIPAs. The adjustments are made to transactions between the United States and its territories, Puerto Rico, and the Northern Mariana Islands, which are treated as part of the United States in the ITAs but are included in the rest of the world in the NIPAs.
Transfer	A transaction in which one party provides a good, service, or asset to another party without receiving anything directly in return.
U.S. direct investment abroad	Represents the ownership or control, directly or indirectly, by one U.S. resident of at least 10 percent of a foreign business enterprise (see also "Direct investment").

U.S. residents	Comprises (1) individuals residing permanently in the United States, (2) business enterprises and nonprofit organizations established under U.S. laws, including corporations, partnerships, and proprietorships; and (3) U.S. federal, state, and local governments, together with their subdivisions. Includes individuals who reside or expect to reside in the United States for 1 year or more. Exceptions are made for foreign students who study in the United States and for foreigners who travel to the United States for medical treatment, both of which are considered foreign residents regardless of their length of stay. Similarly, U.S. government employees stationed abroad (and their families)—such as diplomats, consular officials, and members of the armed forces—are also considered U.S. residents regardless of their length of stay. Affiliates of multinational corporations are considered residents of the country in which they are located, not residents of the country of the parent; thus, U.S. affiliates of foreign corporations are considered U.S. residents. The NIPA definition is consistent with the definition of U.S. residents in the international transactions accounts (ITAs), but in the NIPAs, residents of the U.S. territories, Puerto Rico, and the Northern Mariana Islands are treated as foreign residents while in the ITAs, they are treated as U.S. residents (see "Territorial adjustment").
U.S. Travel and Tourism Satellite Accounts (TTSAs)	Annual accounts that provide a detailed picture of travel and tourism activity and its role in the U.S. economy. The TTSAs present estimates of expenditures by tourists or other visitors on 24 types of goods and services. The accounts also present estimates of the income generated by travel and tourism and estimates of the output and the employment generated by industries associated with travel and tourism.
Value added	For the nation, total value added (or GDP) is the value of all the goods and services produced by the economy (gross output) less the value of those goods and services that are used in the production process (total intermediate inputs). Value added consists of compensation of employees, taxes on production and imports less subsidies, and gross operating surplus. For an individual industry, value added is equal to gross output (sales or receipts plus other operating income and inventory change) less intermediate inputs (consumption of goods and services purchased from other industries or imported).
Value-added approach	The measurement of GDP as the sum of the value added by each industry at each stage of production.

Wages and salaries	The total remuneration, in cash and in kind, of employees, including the compensation of corporate officers; commissions, tips, and bonuses; voluntary employee contributions to certain deferred compensation 401(k) plans; employee gains from nonqualified stock options; receipts- in-kind; and miscellaneous compensation of employees, such as judicial fees to jurors and to witnesses.
Wholesale margin	The value added by wholesalers in the chain of distribution of a commodity from the producer to the final purchaser. Sometimes referred to as "wholesale markup."

GDP Gross domestic product
NIPAs National income and product accounts
SNA *System of National Accounts*