CHAPTER 5: PERSONAL CONSUMPTION EXPENDITURES
(Updated: December 2020)

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

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[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

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[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.

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[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"

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[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).

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[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.

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**	

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

Line in NIPA table group 2.4	Component	Benchmark year	Nonbenchmark years except the most recent year	Most recent year	Current quarterly estimates**	Quantity and price 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,

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

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.

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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

		Current-dollar estimates				Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
Line in NIPA table group 2.4	Component	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

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.

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.

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

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

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	

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

Line	Component	Benchmark year	Nonbenchmark years	Current quarterly estimates	Quantity and price
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:				

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.

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.

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		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.

		Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
Line in NIPA table group 2.4	Component	Benchmark year	Indicator series used to interpolate and extrapolate*		
			Nonbenchmark years	Current quarterly estimates	

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

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;

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

		Current-dollar estimates			Quantity and price estimates (Quantity estimate prepared by deflating with price index unless otherwise indicated)
Line in NIPA table group 2.4	Component	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.

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

		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.

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 title: **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	

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

Line in NIPA table group 2.4	Component	Benchmark year	Nonbenchmark years	Current quarterly estimates	Quantity and price 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	COG	Census of Governments, Census Bureau	IRS	Internal Revenue Service
BEA	Bureau of Economic Analysis	CPI	Consumer Price Index, BLS	ITA	International Transactions Accounts, BEA
BLS	Bureau of Labor Statistics	EC	Economic Census, Census Bureau	MRTS	Monthly Retail Trade Survey, Census Bureau
BTS	Bureau of Transportation Statistics	EIA	Energy Information Administration		
CES	Current Employment Statistics, BLS	GF	Annual Survey of Government Finances, 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

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[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.

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[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

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[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

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[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

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[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

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[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."

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[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.

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[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

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[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]

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[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*.

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[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

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[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

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[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

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[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:

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[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

- o Research
- Social services
  - o Child care
  - o Individual and family services
  - o Vocational rehabilitation services
  - o Community food and housing services
  - o Homes for the elderly
  - o Residential mental health and substance abuse
  - o 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.