

# Technical Note

## Gross Domestic Product, Fourth Quarter and Year 2022 (Advance Estimate)

January 26, 2023

This technical note provides background information about the source data and estimating methods used to produce the estimates presented in the GDP news release; a summary of "highlights" is available on BEA's website at [www.bea.gov](http://www.bea.gov).

### Economic Conditions and Fourth-Quarter 2022 GDP

Real GDP increased at an annual rate of 2.9 percent (0.7 percent at a quarterly rate<sup>1</sup>) in the fourth quarter of 2022, compared with an increase of 3.2 percent (0.8 percent at a quarterly rate) in the third quarter. The increase occurred amid moderating inflation, low unemployment, continued supply-chain uncertainties, and rising interest rates. The economic effects of these conditions cannot be quantified in the GDP estimate for the fourth quarter of 2022 because the impacts are generally embedded in source data and cannot be separately identified.

Real GDP decelerated in the fourth quarter, compared to the third quarter. The deceleration primarily reflected a downturn in exports and decelerations in nonresidential fixed investment, state and local government spending, and consumer spending. These movements were partly offset by an upturn in private inventory investment, an acceleration in federal government spending, and a smaller decrease in residential fixed investment. Imports decreased less in the fourth quarter than in the third quarter.

### Key Source Data and Assumptions for the Advance Estimate

The advance estimate of GDP for the fourth quarter is based on source data that are incomplete and subject to updates. Three months of source data were available for consumer spending on goods; shipments of capital equipment; motor vehicle sales and inventories; manufacturing, wholesale, and retail trade inventories; exports and imports of goods; federal government outlays; and consumer, producer, and international prices. For major source data series for which only two months of data were available, or for which data for the fourth quarter are not yet available, BEA's assumptions were based on a variety of sources, most notably: private high-frequency payment card transactions data; industry and trade association reports that include volume data, such as health care patient visits and traveler throughput, as well as recreation services revenues and event attendance. More information on the

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<sup>1</sup> Percent changes in quarterly seasonally adjusted series are displayed at annual rates, unless otherwise specified. For more information, refer to the FAQ [Why does BEA publish percent changes in quarterly series at annual rates?](#)

source data and BEA assumptions that underlie the fourth-quarter estimate is shown in the [Key Source Data and Assumptions](#) table.

## Real GDP and Related Aggregates

Real GDP increased 2.9 percent (annual rate) in the fourth quarter, following an increase of 3.2 percent in the third quarter. The increase in real GDP reflected increases in private inventory investment, consumer spending, federal government spending, state and local government spending, and nonresidential fixed investment that were partly offset by decreases in residential fixed investment and exports. Imports, which are a subtraction in the calculation of GDP, decreased.

- Within private inventory investment, increases in manufacturing as well as mining, utilities, and construction industries were partly offset by a decrease in retail trade industries. Within manufacturing, the leading contributors were petroleum and coal products and chemical manufacturing. The fourth quarter estimates were based primarily on Census Bureau inventory data and Bureau of Labor Statistics (BLS) producer price indexes for all three months of the quarter.
- The increase in consumer spending reflected increases in both services and goods. Within services, increases were widespread and led by health care, housing and utilities, and "other" services. Within goods, the leading contributor was motor vehicles and parts.
  - Within health care, the increase was led by outpatient services (notably, physician services) and hospitals (notably, nonprofit hospitals), based primarily on BLS Current Employment Statistics (CES) data as well as private trade data.
  - Within housing and utilities, both categories contributed to the increase. The increase in housing primarily reflected data on housing completions from the Census Bureau. Within utilities, the leading contribution was an increase in natural gas, based on Energy Information Administration (EIA) usage data for October and EIA Short-Term Energy Outlook projections for November and December.
  - The increase in spending on "other" services was led by personal care services, based on BLS CES data.
  - The increase in motor vehicles and parts was led by an increase in new motor vehicles, based primarily on unit sales data from Wards Intelligence.
- The increase in federal government spending was led by nondefense, and primarily reflected a decline in sales of crude oil from the Strategic Petroleum Reserve, based on data from the Department of Energy. Within the National Economic Accounts, these sales are deducted from government consumption expenditures; therefore, a decrease in sales results in a corresponding increase in consumption expenditures. Because the oil sold by the government enters private inventories, there is no direct net effect on GDP.

- The increase in state and local government spending primarily reflected an increase in compensation of state and local government employees, based primarily on BLS employment data.
- Within nonresidential fixed investment, an increase in intellectual property products was partly offset by a decrease in equipment.
  - The increase in intellectual property products mainly reflected an increase in software (mainly prepackaged software), based primarily on BLS employment and wage data.
  - Within equipment, a decrease in information processing equipment (notably, computers and peripherals as well as communications) was partly offset by an increase in transportation (notably, aircraft). The estimates primarily reflected manufacturers' shipments data from the Census Bureau as well as Census-BEA U.S. International Trade in Goods and Services data for October and November and the Census Bureau's Advance Economic Indicators Report for December.
- Within residential fixed investment, the leading contributors to the decrease were new single-family construction, primarily reflecting Census Bureau Value-Put-In-Place construction spending data for October and November, and brokers' commissions and other ownership transfer costs, primarily reflecting existing home sales data from the National Association of Realtors for all three months of the quarter.
- The decreases in both exports and imports primarily reflected Census Bureau-BEA U.S. International Trade in Goods and Services data for October and November and the Census Bureau's Advance Economic Indicators Report for December.
  - For exports, a decrease in goods was partly offset by an increase in services. The decrease in goods primarily reflected widespread decreases in nondurable goods. Within services, travel and transport services were the leading contributors to the increase.
  - For imports, the decrease primarily reflected a decrease in goods, led by durable consumer goods.

Real final sales to private domestic purchasers, which measures private demand in the domestic economy and is derived as the sum of consumer spending and private fixed investment, increased 0.2 percent in the fourth quarter after increasing 1.1 percent in the third quarter.

## Prices

BEA's featured measure of inflation in the U.S. economy, the price index for gross domestic purchases, increased 3.2 percent in the fourth quarter, following a 4.8 percent increase in the third. Excluding food and energy, gross domestic purchases prices increased 3.8 percent, after increasing 5.0 percent.

The price index for personal consumption expenditures (PCE) increased 3.2 percent in the fourth quarter, after increasing 4.3 percent in the third. In the fourth quarter, PCE food prices increased 5.9 percent, while energy prices decreased 14.3 percent. Excluding food and energy, the "core" PCE price index increased 3.9 percent, after increasing 4.7 percent. The fourth-quarter increase in core PCE prices reflected widespread increases for services (led by housing and food services) that were partly offset by a decrease in goods (led by used motor vehicles). Prices were based primarily on BLS consumer and producer price indexes. For a comparison of PCE prices to BLS consumer price indexes, refer to [NIPA Table 9.1U. Reconciliation of Percent Change in the CPI with Percent Change in the PCE Price Index](#).

## Disposable Personal Income

Real disposable personal income (DPI) increased 3.3 percent (annual rate) in the fourth quarter, compared with an increase of 1.0 percent in the third quarter. Current-dollar DPI increased 6.5 percent, after increasing 5.4 percent.

The increase in fourth quarter current-dollar DPI primarily reflected an increase in compensation (led by private wages and salaries), government social benefits, and personal income receipts on assets.

- Within compensation, the leading contributor to the increase was private wages and salaries, based primarily on BLS CES data.
- Within government social benefits, the leading contributor to the increase was "other" benefits, primarily reflecting an increase in [one-time state refundable tax credits](#), based on a combination of media reports and state-level administrative data.
- Within personal income receipts on assets, the increase reflected increases in both interest and dividend income.

The personal saving rate was 2.9 percent in the fourth quarter, compared with 2.7 percent in the third quarter.

## GDP for 2022

Real GDP increased 2.1 percent in 2022 (from the 2021 annual level to the 2022 annual level), compared with an increase of 5.9 percent in 2021. The increase in real GDP in 2022 primarily reflected increases in consumer spending, exports, private inventory investment, and nonresidential fixed investment that were partly offset by decreases in residential fixed investment and federal government spending. Imports increased.

Measured from the fourth quarter of 2021 to the fourth quarter of 2022, real GDP increased 1.0 percent during the period, compared with an increase of 5.7 percent from the fourth quarter of 2020 to the fourth quarter of 2021.

### **Updated GDP and Personal Income Per Capita Statistics**

BEA's per capita income and product statistics, featured in [NIPA table 7.1](#), have been updated beginning with the first quarter of 2020. The revised historical time series reflects the latest Census Bureau [population statistics](#), released in December 2022.

### **More Information**

The complete set of statistics is available on [BEA's website](#). In a few weeks, the *Survey of Current Business*, BEA's online journal, will present a more detailed analysis of the estimates ("GDP and the Economy").

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