

# High Inflation in BEA's Statistics

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*Meeting of the Group of Experts on National Accounts*

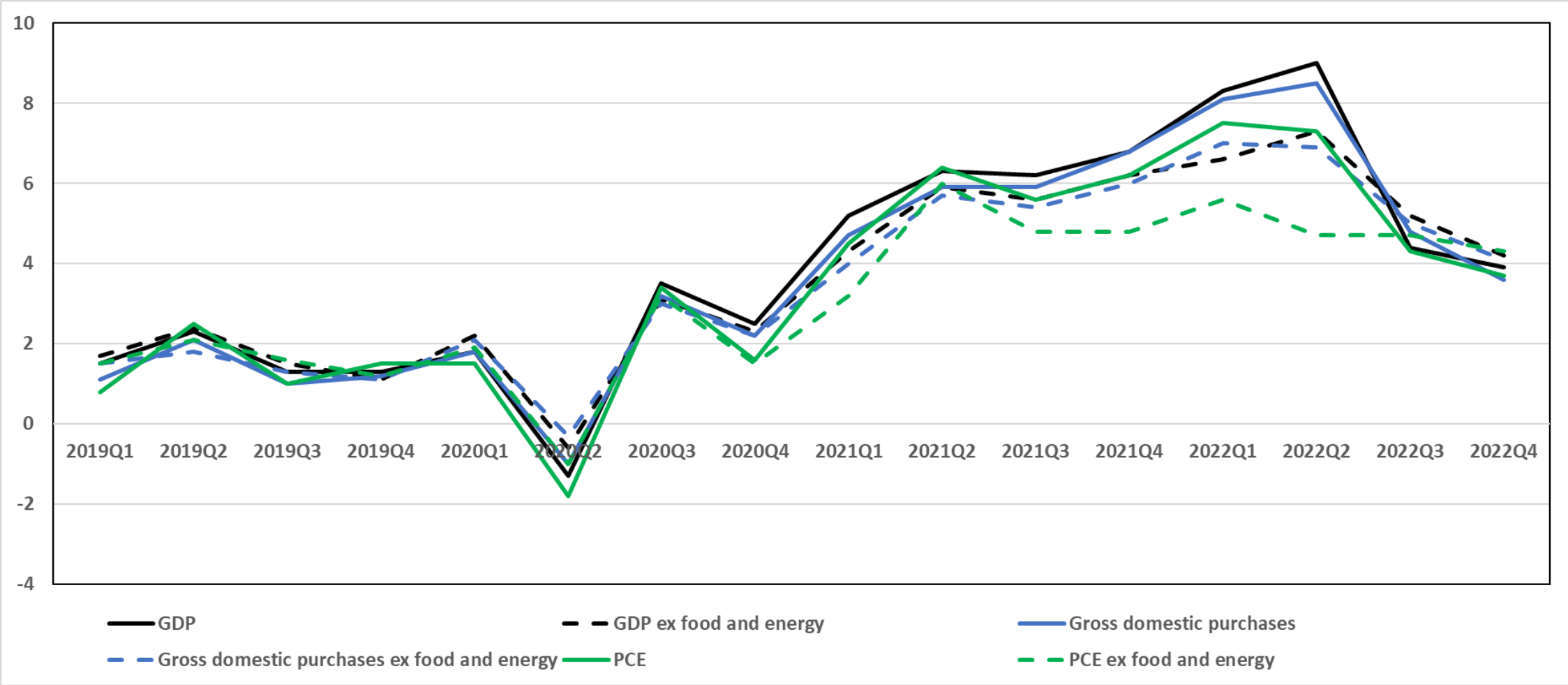
*Geneva, Switzerland, 25-27 April 2023*



- Prices for gross domestic product (GDP, expenditure approach)
  - final consumption (households, NPISH, government) + capital formation + exports – imports
- Prices for gross domestic purchases - equal to GDP minus net exports
  - goods and services purchased by U.S. residents, regardless of where produced
- Prices for personal consumption expenditures (PCE) –
  - actual final consumption of households and NPISH
  - includes purchases financed by both cash and in-kind government transfers (eg, health insurance)
  - often compared with CPI
  - monthly PCE prices (released 30 after month) are important for “real time” updates
- “Core” prices (less food and energy) and prices for detailed components
- Prices for gross value added, output, intermediate consumption by industry

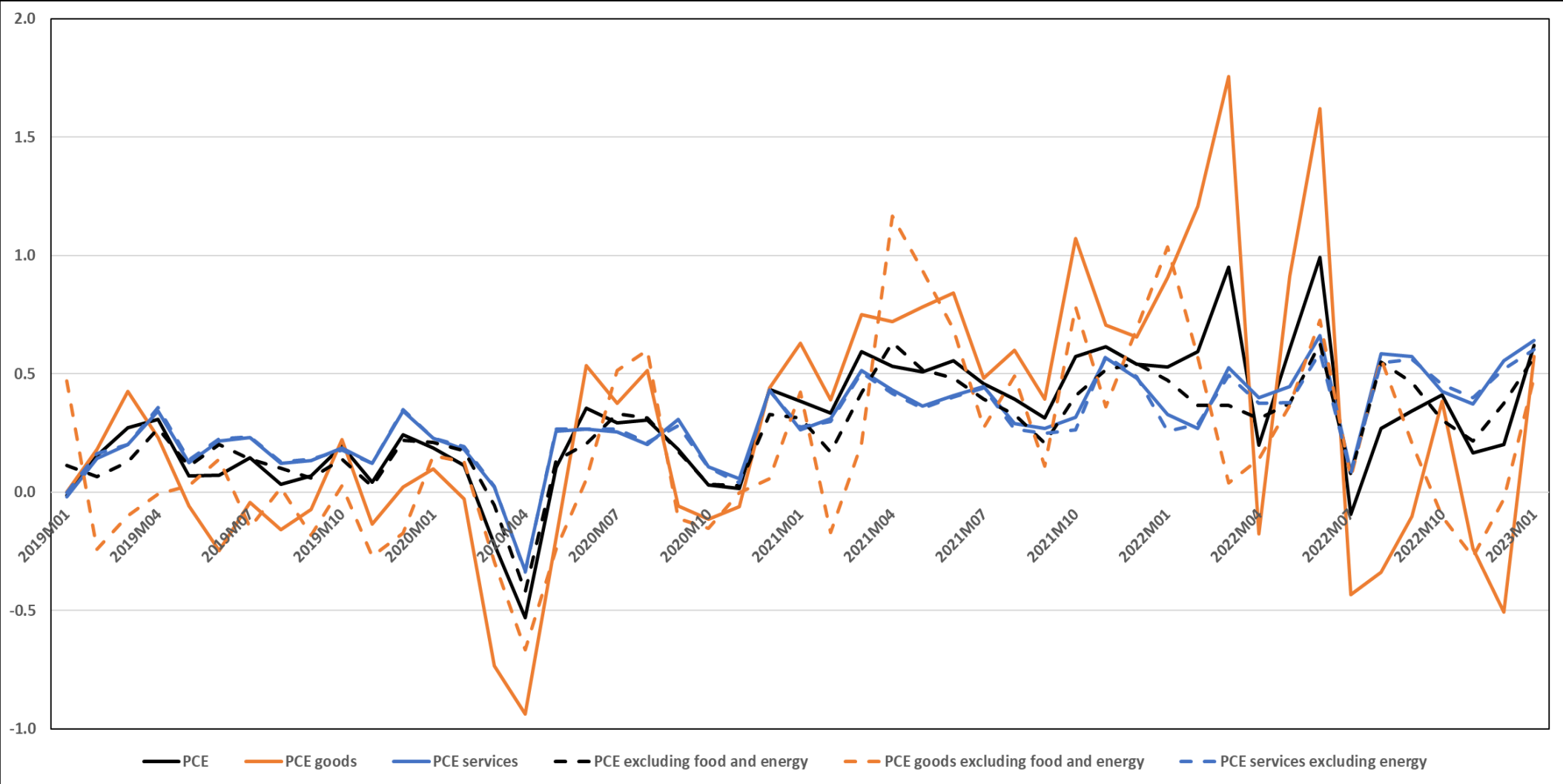
# Key quarterly price measures

Percent change from preceding quarter, SAAR



# Key monthly price measures

Percent change from preceding month in PCE prices, seasonally adjusted at monthly rates



# Prices: data sources and methods

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- BEA deflates at the detailed commodity level, using appropriate price measures from several sources
- PCE
  - Bureau of Labor Statistics (BLS) Consumer Price Indexes (CPIs)
  - BLS Producer Price Indexes (PPIs) for health care and financial services
  - Input costs indexes for NPISH, using CPIs, PPIs, BLS Employment Cost Index (ECI)
- Gross fixed capital formation
  - Equipment: Mostly BLS PPIs, also BLS import price indexes
  - Structures: Census Bureau price index for single-family houses under construction, Turner Construction Co. building-cost index
  - Software: PPIs and BEA composite input cost index with productivity adjustment
  - R&D: BEA composite input cost index with productivity adjustment
- Imports and Exports
  - Mostly BLS import and export price indexes
- Government
  - BEA composite input cost indexes, BLS employment cost indexes, PPIs and CPIs

# Prices: data sources and methods (cont'd)

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- Seasonal adjustment occurs at the detailed commodity level
  - Source data agencies often provide seasonally adjusted prices (for example, CPIs)
  - BEA seasonally adjusts selected PPIs and other price measures
- Quality adjusted prices for several commodities
  - Possibly less relevant for short-run price changes?
- Aggregation uses chain-type measures
  - Chain-weighted, versus fixed-weighted, captures substitution effects
- Some key issues and challenges
  - Seasonal adjustment (and associated revisions) can be challenging during and after the pandemic
  - Aligning mid-month price indexes with full-month expenditures
  - Survey response rates can be low
  - Matching current-price expenditures with definitionally appropriate prices is important
  - Contributions calculations are needed to remove the effects of select items (eg for core measures)

- Revisions to source data outside the current “open” quarter are not fully incorporated until the next annual update
  - More important with larger revisions and a need to get the latest picture ASAP.
- Example: revised seasonal factors for BLS CPIs:
  - In February 2023, BLS revised CPI seasonal factors for the last 5 years
  - BEA's open period of revision was limited to October-December
  - PCE prices do not fully reflect the latest CPI data until annual update

# Estimate review process, use of alternative indicators, and research

- During times of rapid changes and high inflation
  - We have paid close attention to the possible role of price changes in our current-price source data
  - Additional time to review relationship between changes in prices and current-price measures
    - Sales, shipments, receipts, expenses...
  - One issue is that monthly CPIs and PPIs are “mid-month” measures
    - They may not fully reflect rapid price changes within a month
    - For example, we augment the PPI for petroleum with Department of Energy’s Refiners Acquisition Cost Index
- BEA obtained more alternative indicators during and after the pandemic:
  - Fiserv: real-time estimates of credit card transactions for several industries
    - <https://www.bea.gov/recovery/estimates-from-payment-card-transactions>
  - Health care and mass transit: private volume measures of service utilization
  - Air travel: Transportation Safety Administration (TSA) passenger quantity data
  - Numerous other indicators that help us understand changes in quantities and prices
- BEA staff also investigated price measurement when products are unavailable.
  - <https://apps.bea.gov/fesac/>



# The inventory valuation adjustment is both important and challenging with high inflation (Billions of current dollars)

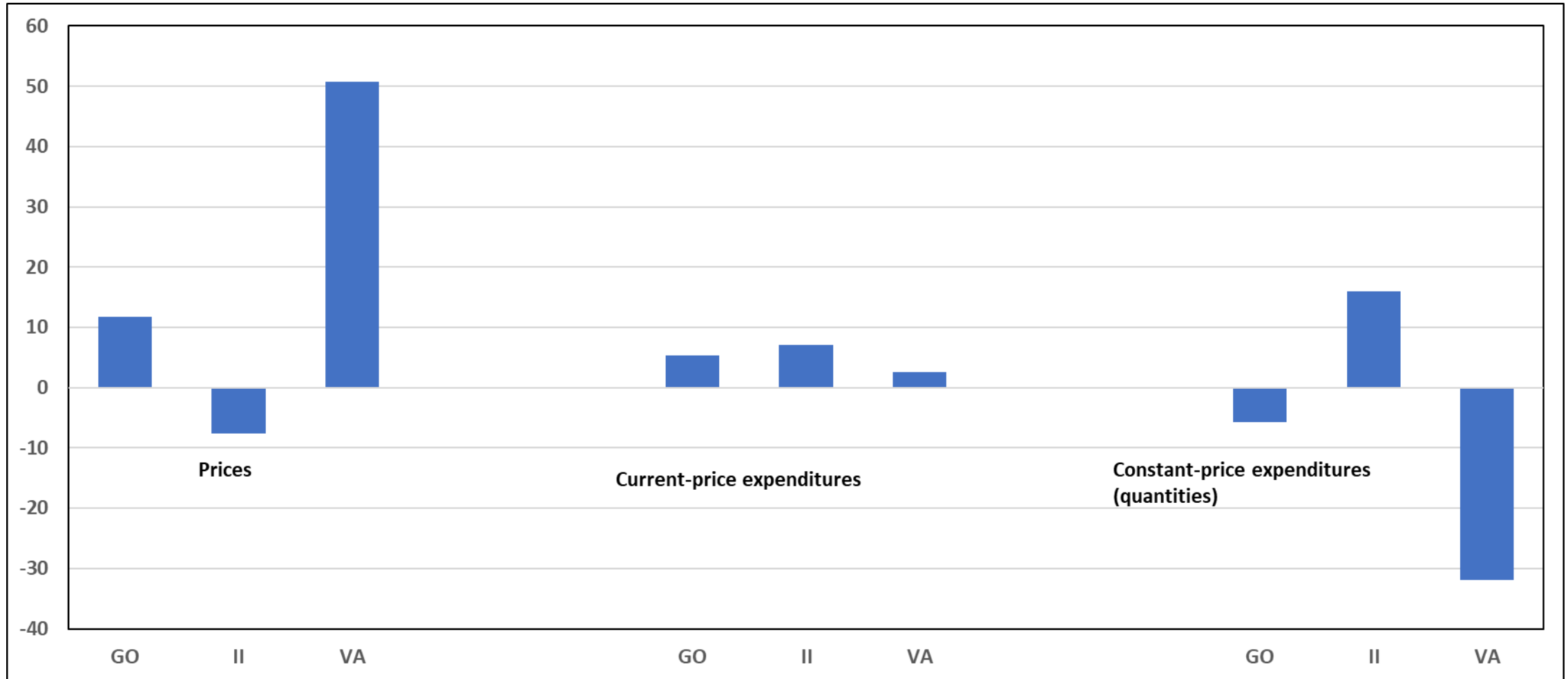


# Double deflation: Gross output, intermediate inputs, value added

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- With double deflation, GO and II have separate price measures
- Recently....
  - prices for GO and II can differ substantially
  - leads to notable differences in current-price vs constant-price changes in VA
  - A good example: petroleum refining

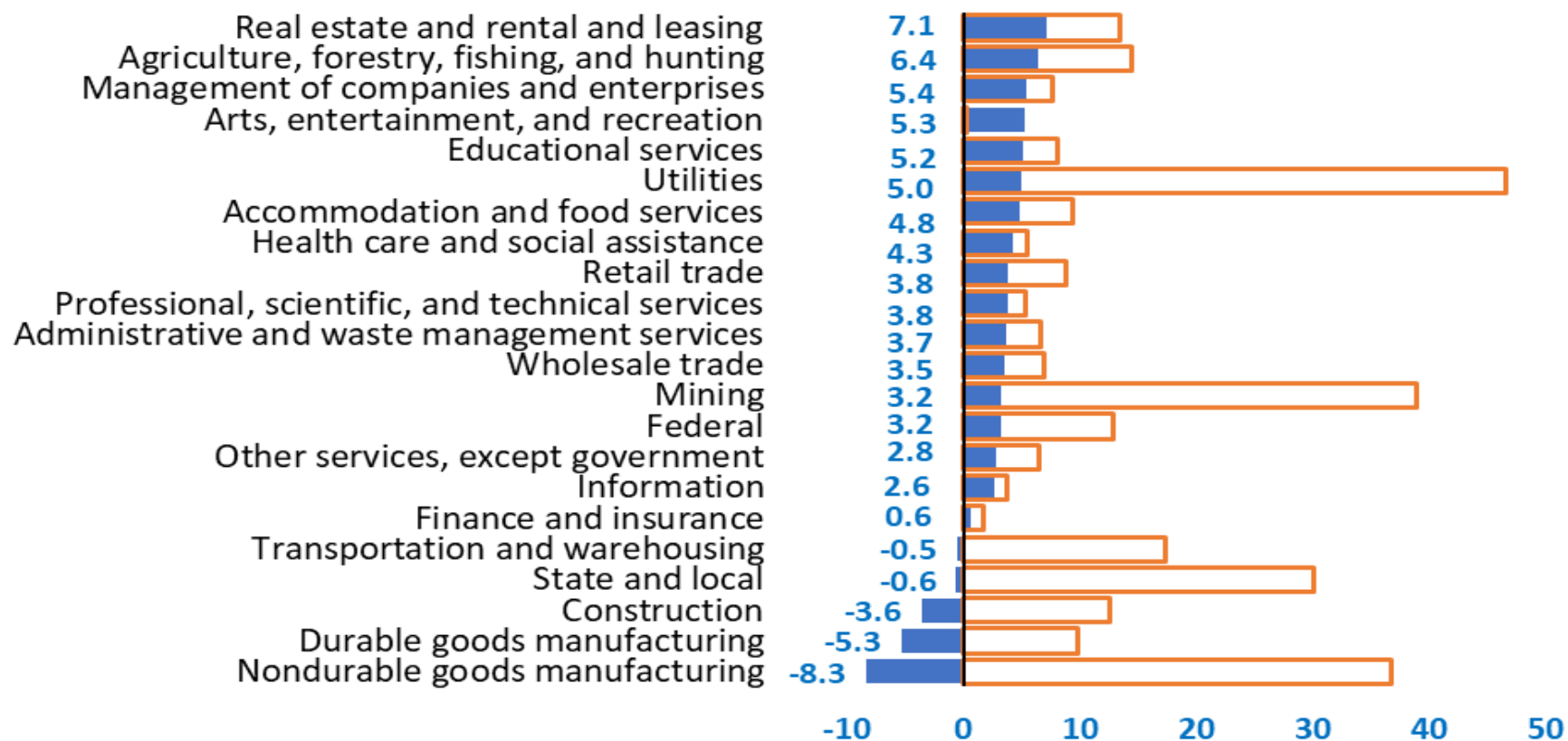
# Manufacturing, petroleum and coal products: Percent changes in prices, current-price values, and constant-price values, for GO, II, VA, 2022Q3, (SAAR)



# Intermediate Input Prices By Industry

## Intermediate Input Prices By Industry

Percent Change, 2022Q2 and 2022Q3

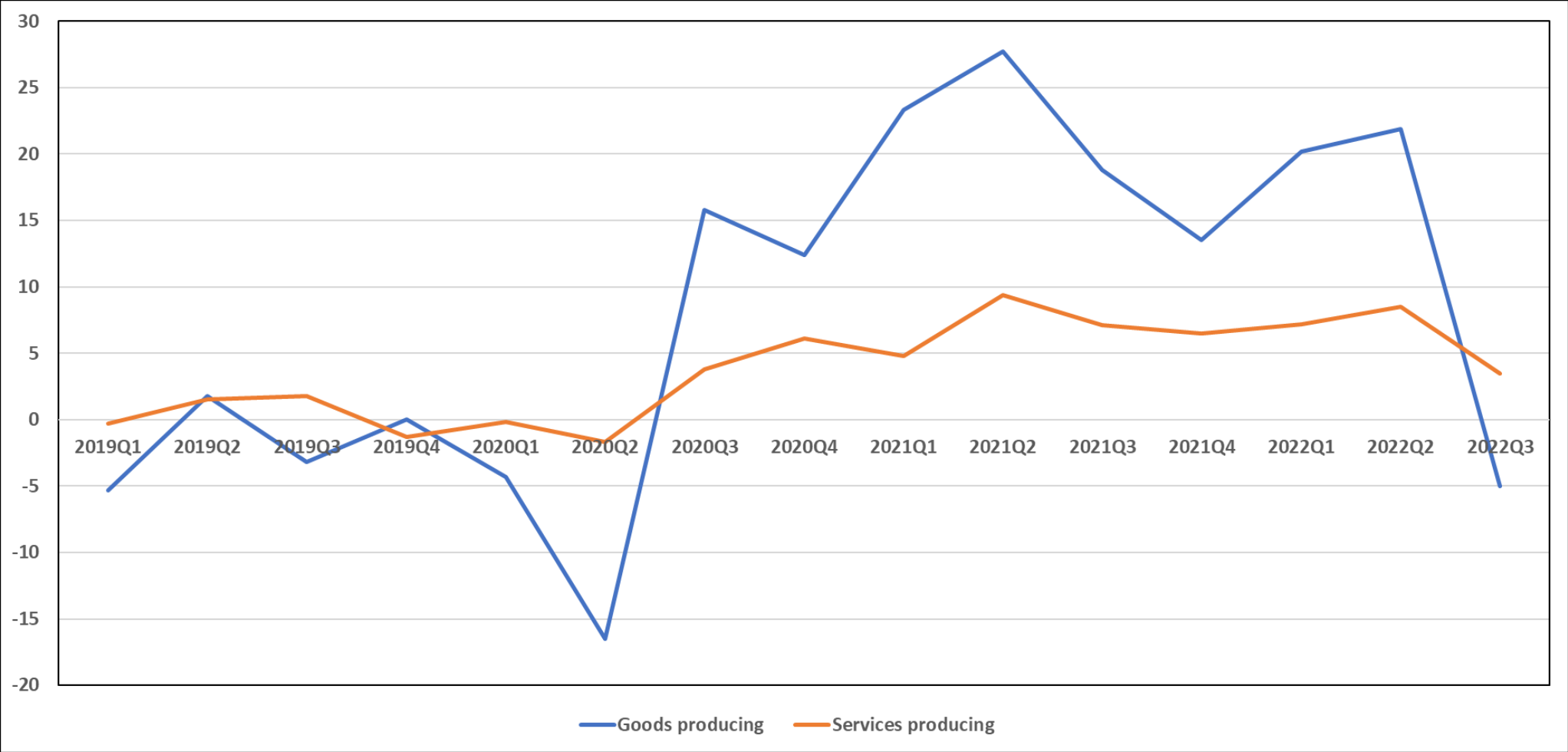


Seasonally adjusted at annual rates.

Source: U.S. Bureau of Economic Analysis

# Intermediate input prices, private industries

Percent change from preceding quarter, SAAR

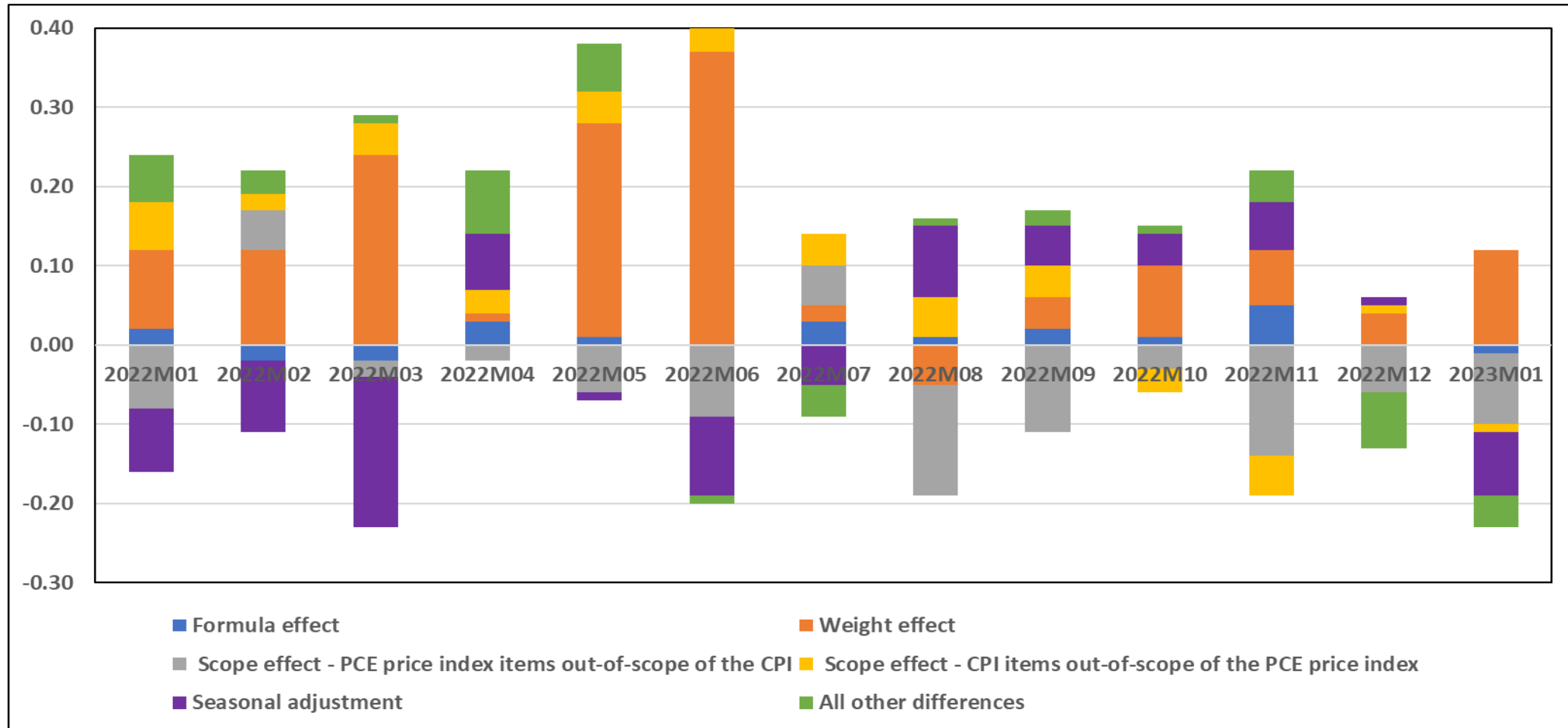


# PCE price index (PCE PI) vs CPI: Key differences

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- **Formula effect**
  - CPI uses a modified Laspeyres formula; PCE PI uses a Fisher Ideal formula
- **Scope effects**
  - CPI: out-of-pocket expenditures of all urban households
  - The PCE PI: purchases by households and NPISHs financed by cash, third party payors (eg insurance) and in-kind government transfers (eg, health insurance)
- **Weight effect**
  - CPI: relative weights based primarily on household surveys
  - PCE PI: relative weights based primarily on business surveys
    - higher weights to health care and financial services
    - lower weights to housing and transportation
- **Other effects**
  - Seasonal adjustment, price differences, all other differences

# Moving from the PCE price index to CPI: Recent history (percentage points from each effect)



Positive numbers indicate that CPI is higher than the PCE PI due to the effect.

Weight effect frequently results from higher weight for housing in the CPI.

Scope effect (in PCE not in CPI) frequently results from additional weight for health care services in PCE PI.

# “Artisinal” inflation measures and other research

- Olivier Blanchard: “When shocks to relative prices come largely from other sectors than energy or food, core inflation can be a very bad measure of underlying inflation.”
- Economists would like to subtract chosen commodities from aggregate prices
  - PCE prices less food, energy, housing, used cars, financial services, portfolio management...
- Alternative inflation measures
  - “Supercore” inflation -- excludes food, energy, used cars, and housing
  - [Cleveland Federal Reserve’s trimmed means CPI](#)
  - [Atlanta Federal Reserve- sticky price CPI](#)
  - New York Federal Reserve - [Multivariate Core Trend \(MCT\)](#) and [Underlying Inflation Gauge](#)
  - Average hourly wages, BLS Employment Cost Index
- [National Academies Panel on Improving Cost of Living Indexes and Consumer Inflation Statistics in the Digital Age](#)
  - Several suggestions for improving the CPI (also relevant for BEA)
  - Some research suggests that inflation varies for lower- and higher- income households



# Contributions tables for chain weighted aggregates

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- Contributions tables are helpful
  - These tables show the contributions (in percentage points) to aggregate percent changes
  - Analysts can easily subtract contributions to estimate “PCE prices excluding...”
  - Without these tables, analysts need to estimate contributions
    - Contributions = share of current-price levels in previous period X price change
- BEA currently publishes a limited set of price contributions tables
  - For GDP and gross domestic purchases
  - BEA produces current expenditures and prices for detailed PCE categories, but not PCE contributions tables
  - Some want contributions tables for year over year price changes in addition to m/m or q/q

- [BEA Web Page: COVID-19 and Recovery](#)
  - Estimates of the expenditures of several government programs included in GDP and personal income
  - Research on estimates from payment card transactions
  - Technical notes and press releases from recent estimates
    - GDP, personal income, International Transactions Accounts
  - Frequently asked questions (FAQs) on several topics
  - [Paper summarizing the treatment of government programs](#)
- NIPA Handbook: Concepts and Methods of the U.S. National Income and Product Accounts
- FAQs, press releases
- Subject matter experts, media and customer service representatives, contact information available on website