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
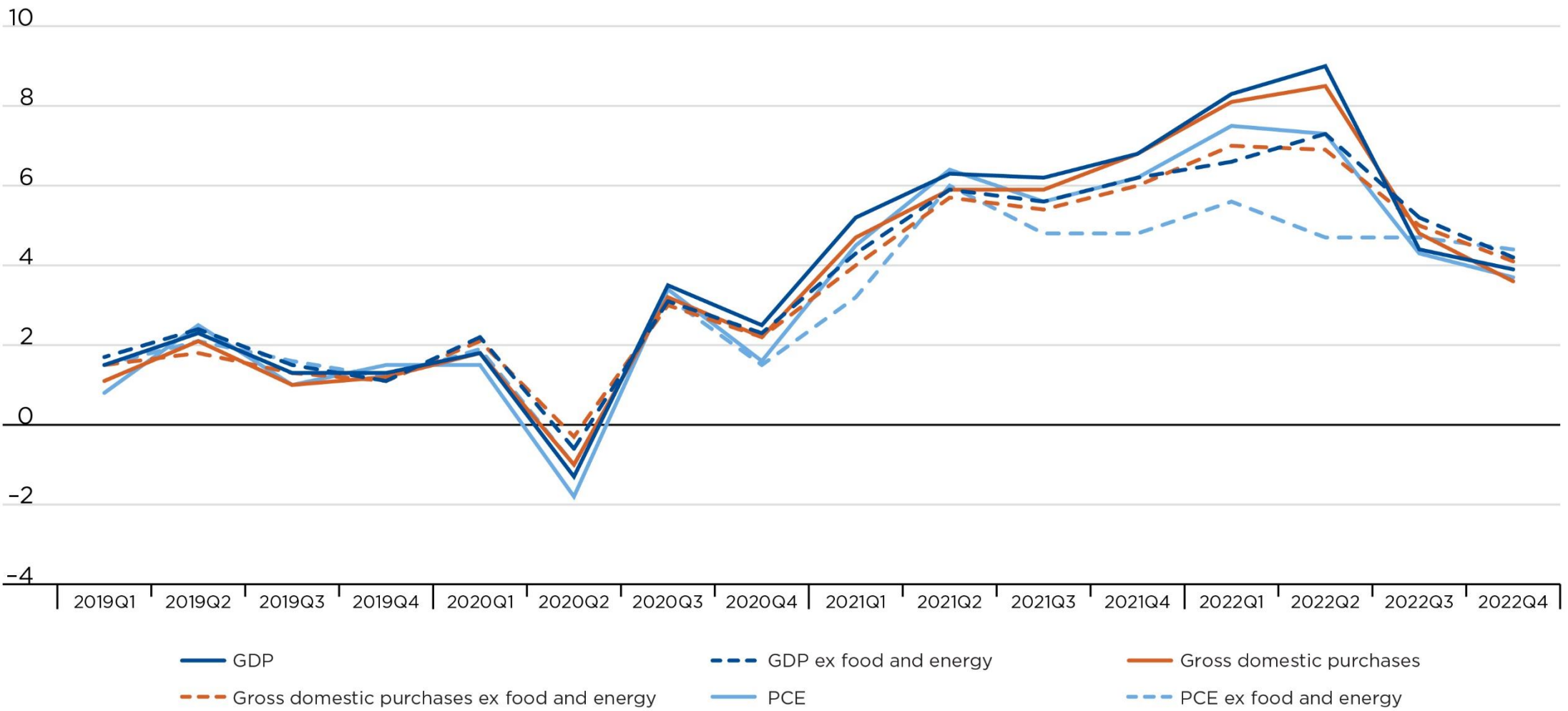
- Prices for gross domestic product (GDP, expenditure approach)
  - final consumption (households, NPISH, government) + capital formation + exports – imports

- 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, seasonally adjusted at annual rates

Legend:
- GDP
- GDP ex food and energy
- Gross domestic purchases
- Gross domestic purchases ex food and energy
- PCE
- PCE ex food and energy

Key monthly price measures

Percent change from preceding month in PCE prices, seasonally adjusted at monthly rates
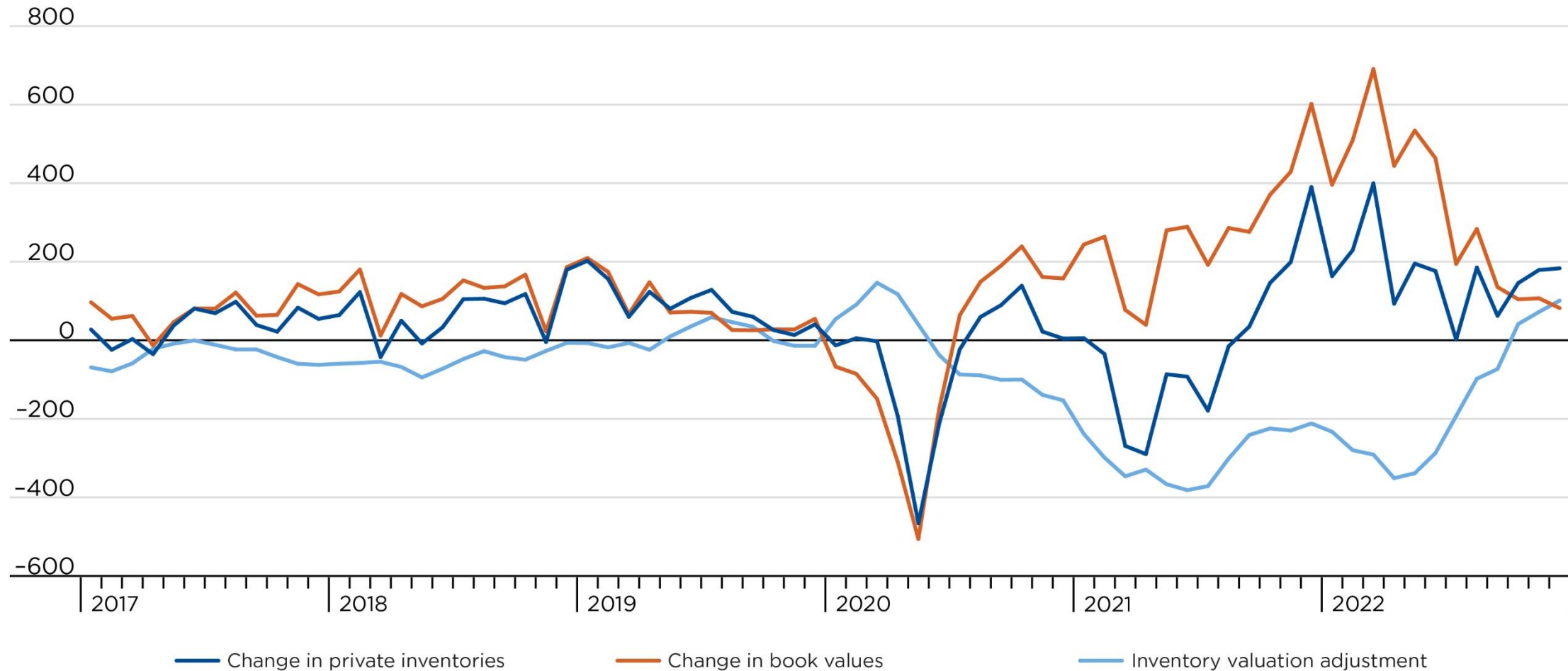
Prices: data sources and methods
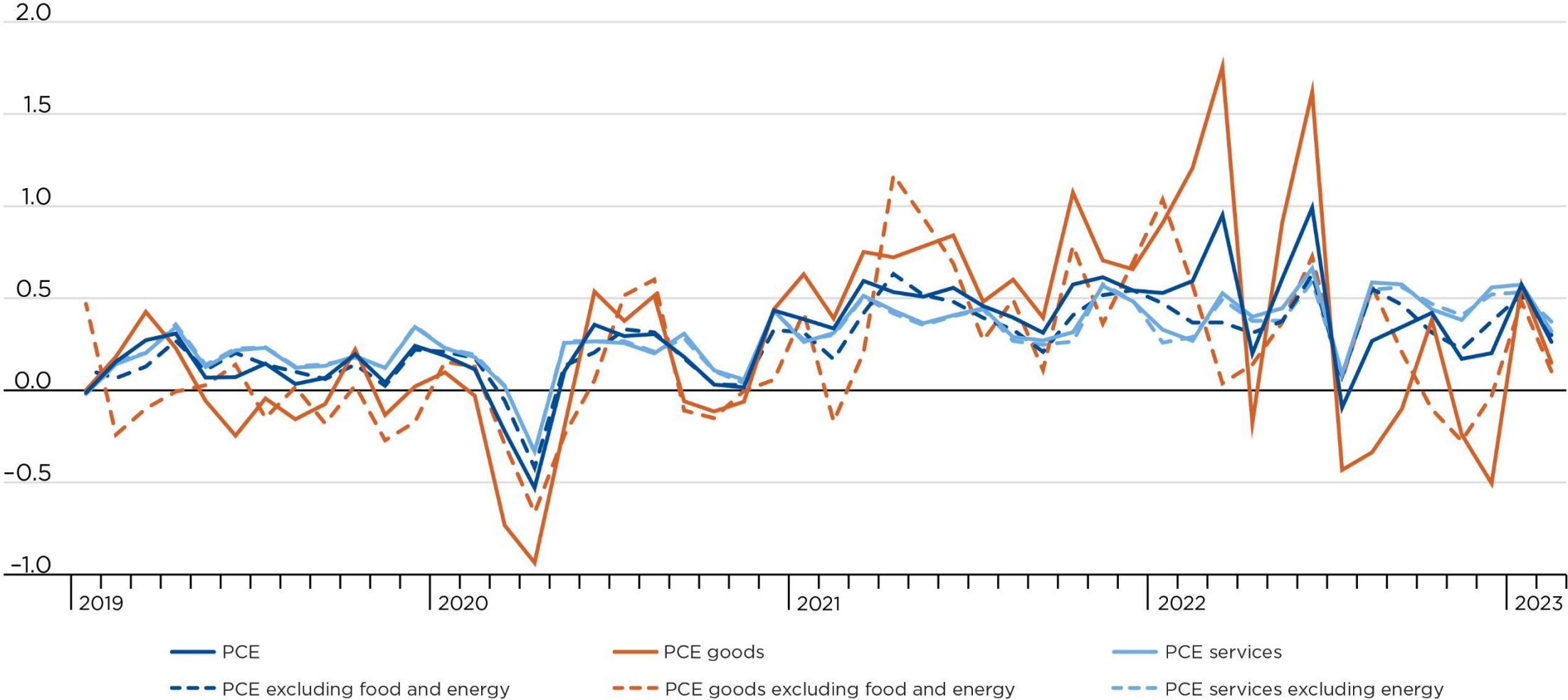
- BEA deflates at the detailed commodity level, using appropriate price measures from several sources

- 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-weighed, 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)

- 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/

Billions of current dollars

Change in private inventories — Change in book values — Inventory valuation adjustment

- 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
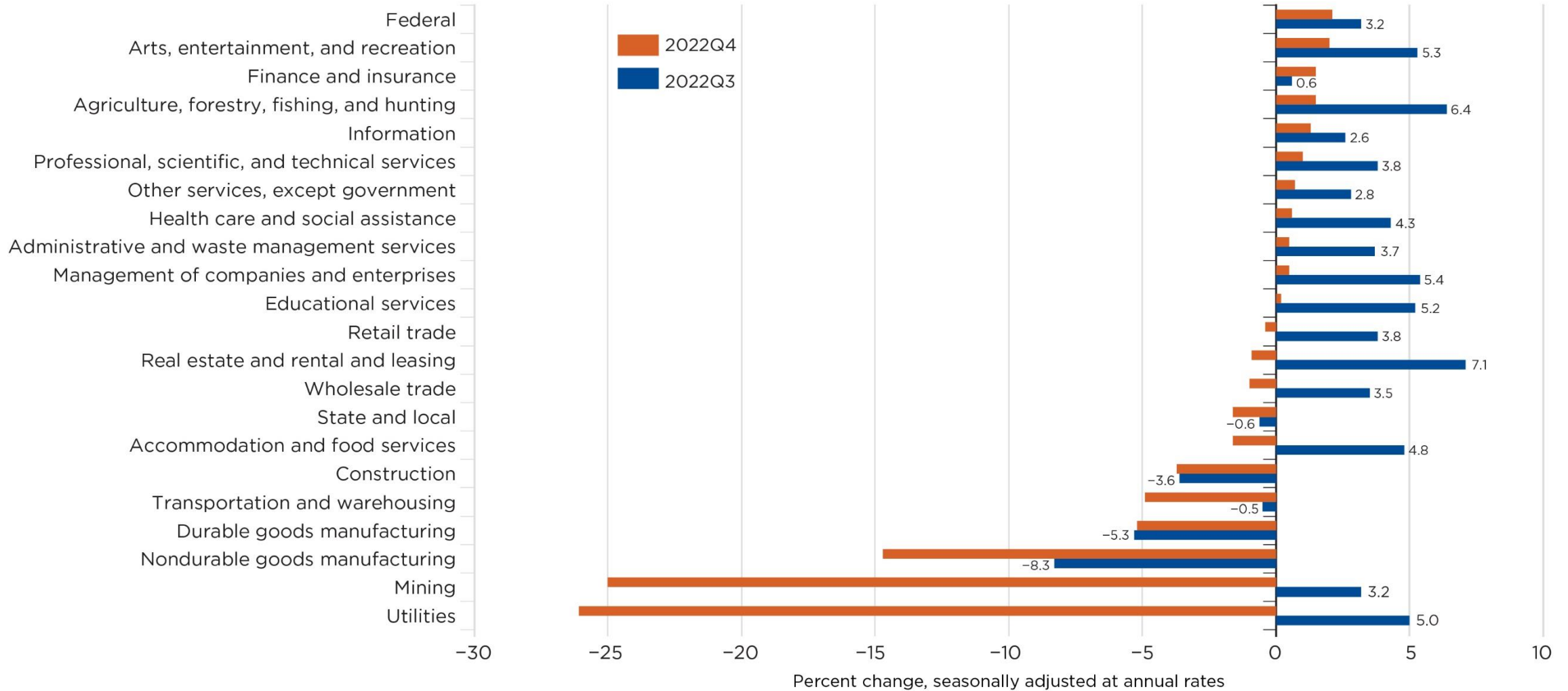
  - A good example: petroleum refining

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

Percent change, seasonally adjusted at annual rates
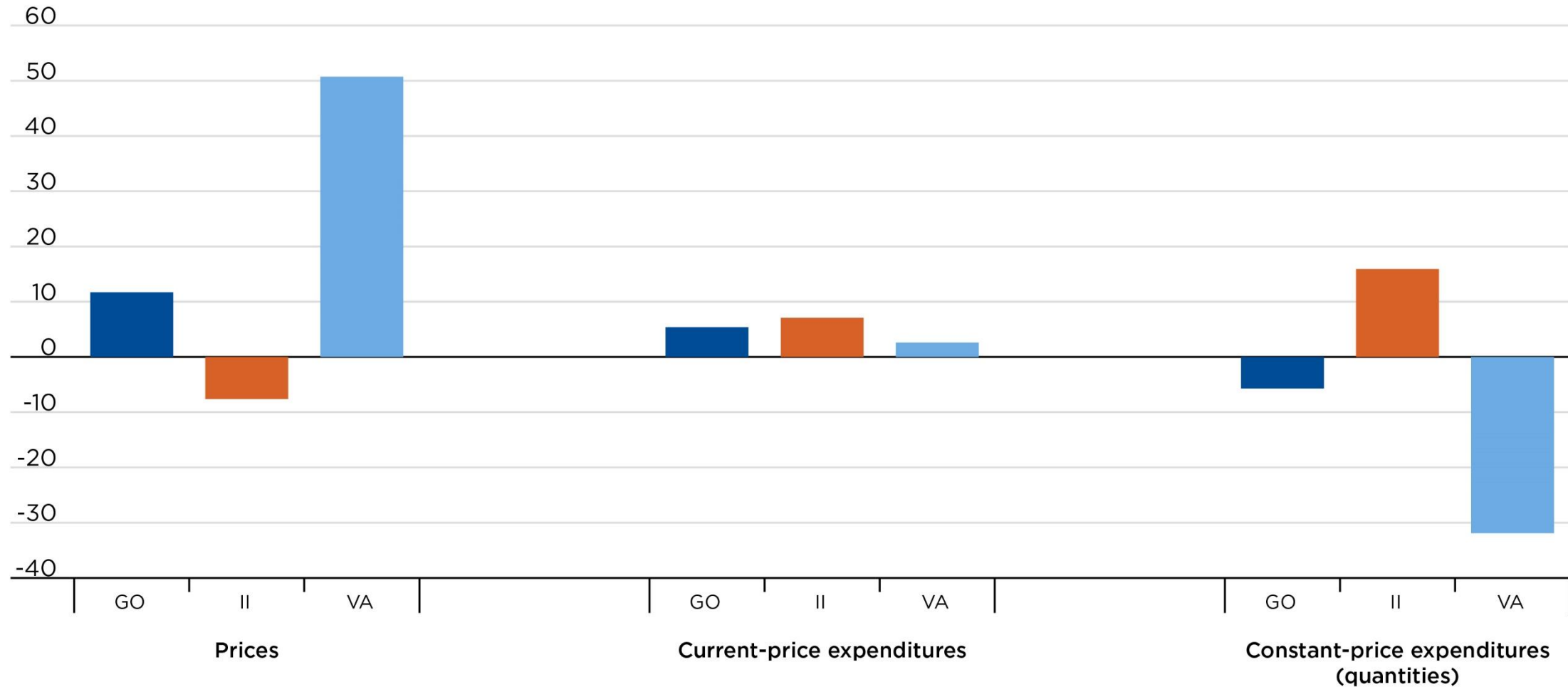
Intermediate Input Prices By Industry

Percent change, seasonally adjusted at annual rates

Legend:
- 2022Q4 (orange)
- 2022Q3 (blue)

Industry	2022Q4	2022Q3
Federal		3.2
Arts, entertainment, and recreation		5.3
Finance and insurance		0.6
Agriculture, forestry, fishing, and hunting		6.4
Information		2.6
Professional, scientific, and technical services		3.8
Other services, except government		2.8
Health care and social assistance		4.3
Administrative and waste management services		3.7
Management of companies and enterprises		5.4
Educational services		5.2
Retail trade		3.8
Real estate and rental and leasing		7.1
Wholesale trade		3.5
State and local	−0.6	
Accommodation and food services		4.8
Construction	−3.6	
Transportation and warehousing	−0.5	
Durable goods manufacturing	−5.3	
Nondurable goods manufacturing	−8.3	
Mining		3.2
Utilities		5.0

Intermediate input prices, private industries

Percent change from preceding quarter, SAAR

Goods producing — — Services producing

4/13/2023
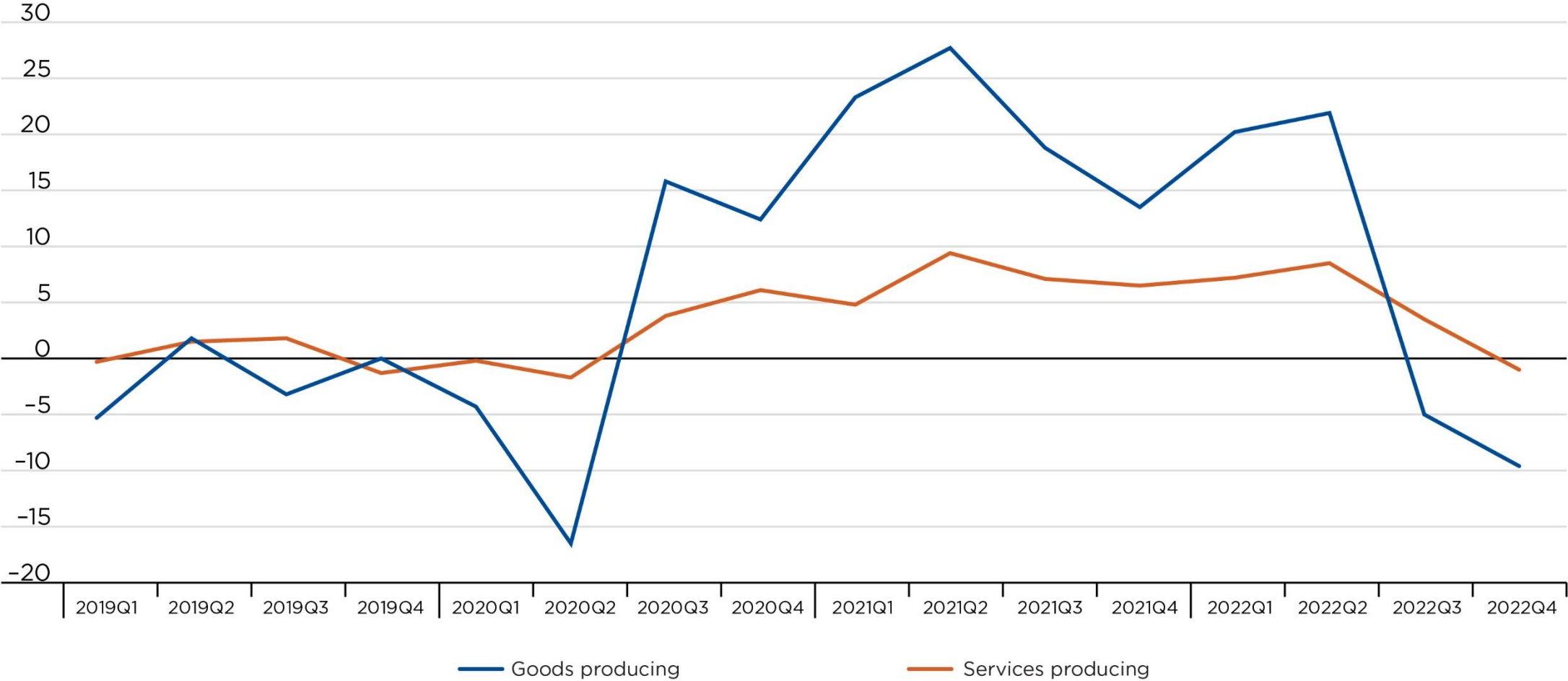
PCE price index vs CPI: Key differences

Line		2020Q4	2021Q1	2021Q2	2021Q3	2021Q4	2022Q1	2022Q2	2022Q3	2022Q4
1	PCE Chain-type price index (percent change)	1.6	4.5	6.4	5.6	6.2	7.5	7.3	4.3	3.7
2	Less: Formula effect (percentage points)	-0.23	-0.13	-0.25	-0.11	-0.16	0.06	-0.07	-0.21	-0.23
12	Equals: PCE fixed-weight price index (percent change)	1.88	4.63	6.69	5.70	6.35	7.41	7.36	4.53	3.97
13	Less: Weight effect (percentage points)	-1.22	-0.91	-2.51	-2.37	-2.28	-1.94	-2.11	-1.39	-0.58
21	Less: Scope effect - PCE price index items out-of-scope of the CPI (ppts)	0.87	2.02	1.66	1.12	1.10	0.76	0.29	0.64	1.06
28	Plus: Scope effect - CPI items out-of-scope of the PCE price index (ppts)	-0.07	0.32	0.09	0.14	0.32	0.42	0.43	0.51	-0.07
32	Less: Other effects (percentage points)	-0.65	-0.35	0.11	0.49	-0.95	-0.16	-0.04	0.24	-0.74
39	Equals: CPI (percent change)	2.8	4.2	7.5	6.6	8.8	9.2	9.7	5.5	4.2
CPI: Consumer Price Index										
PCE: Personal Consumption Expenditures										

"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 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