What Explains Global Inflation

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Rogoff's Work on Global Inflation

- First comprehensive analysis of **global inflation** by describing a "near-universal fall in inflation" and its underlying drivers

  –Rogoff (2003; 2007)

- Dangers of **reversing global disinflation** because of deglobalization, geopolitical tensions, deterioration in central bank independence, and debt accumulation. Roles of massive fiscal and monetary stimulus in fueling inflation.

  –Rogoff (2022a; 2022b)

- Many other papers by Rogoff covering monetary policy, central bank design, and some other issues related to inflation

Our Paper

Contributions

- First systematic study of the ***drivers of global inflation***

- Roles played by ***global demand, supply, interest rate, and oil price shocks***

- Theory-motivated empirical model; Novel shock identification scheme

Three Questions

- What have been the main drivers of global inflation over the past half-century?

- How have the roles of these drivers changed over time?

- How important have these drivers been for the global core and PPI inflation?

Empirical Methodology

- ***Dynamic factor models*** to estimate global (headline CPI) inflation, global output growth, and global interest rates.

- ***FAVAR models*** to identify the impact of global shocks on global inflation (with four variables)

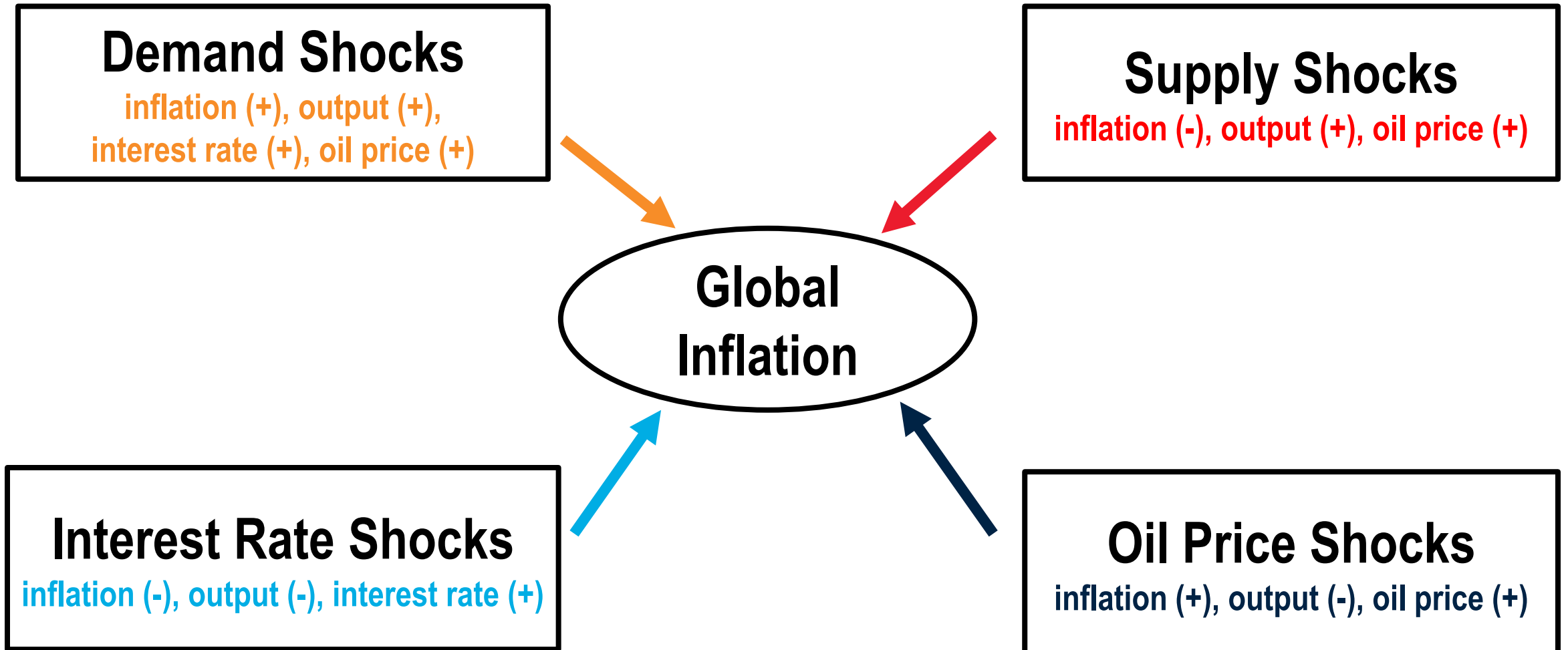$$B_0 Z_t = \alpha + \sum_{i=1} B_i Z_{t-i} + \varepsilon_t$$

Z_t: global inflation, global output growth, global interest rates, and oil price growth

- ***Database:*** G7 countries, 1970m1-2022m10 (extended to 2023m8). Inflation (CPI); output (industrial production); interest rate (3-month T Bill yields); oil price (average of Brent, Dubai, and WTI). All variables are month-on-month, seasonally adjusted, log-differenced, and demeaned.

Identification of Shocks

- *Shock identification motivated by a DSGE model.* Households / firms (consumers / producers of oil and non-oil products); Inflation (staggered pricing of varieties); Monetary policy (CPI-based inflation targeting); Model dynamics (bond accumulation).

- *Shocks in the model.* Demand (preference), supply (productivity in the non-oil sector), interest rate (monetary policy), and oil price (productivity in the oil sector).

- *Identification with sign restrictions.* Sign restrictions used to identify shocks in the FAVAR model are consistent with the impulse responses produced by the DSGE model

- *Identification with narrative restrictions.* Impose restrictions on oil price shocks around key historical events.
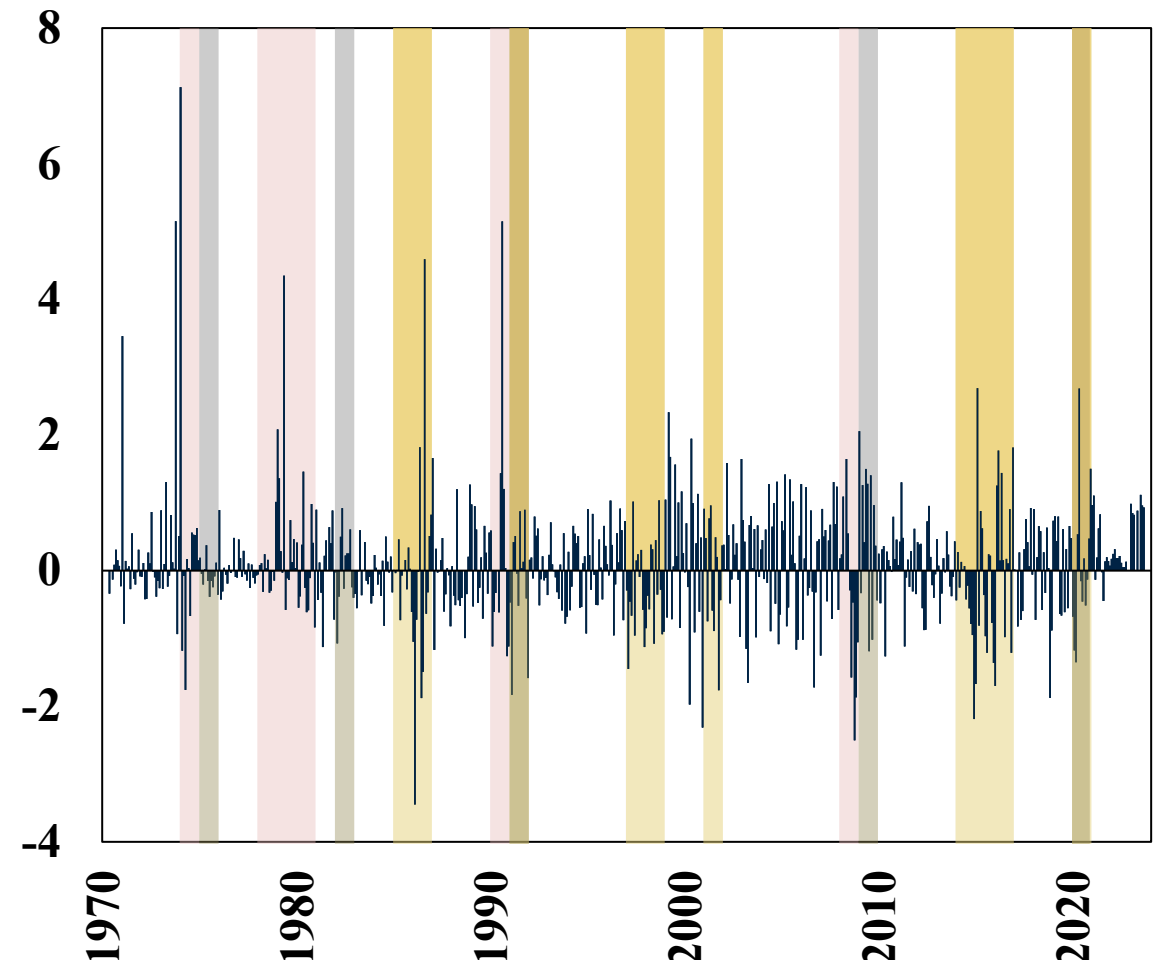
Drivers of Global Inflation

Demand Shocks
inflation (+), output (+),
interest rate (+), oil price (+)

Supply Shocks
inflation (-), output (+), oil price (+)

Global Inflation

Interest Rate Shocks
inflation (-), output (-), interest rate (+)

Oil Price Shocks
inflation (+), output (-), oil price (+)

Global Inflation and Oil Price Shocks

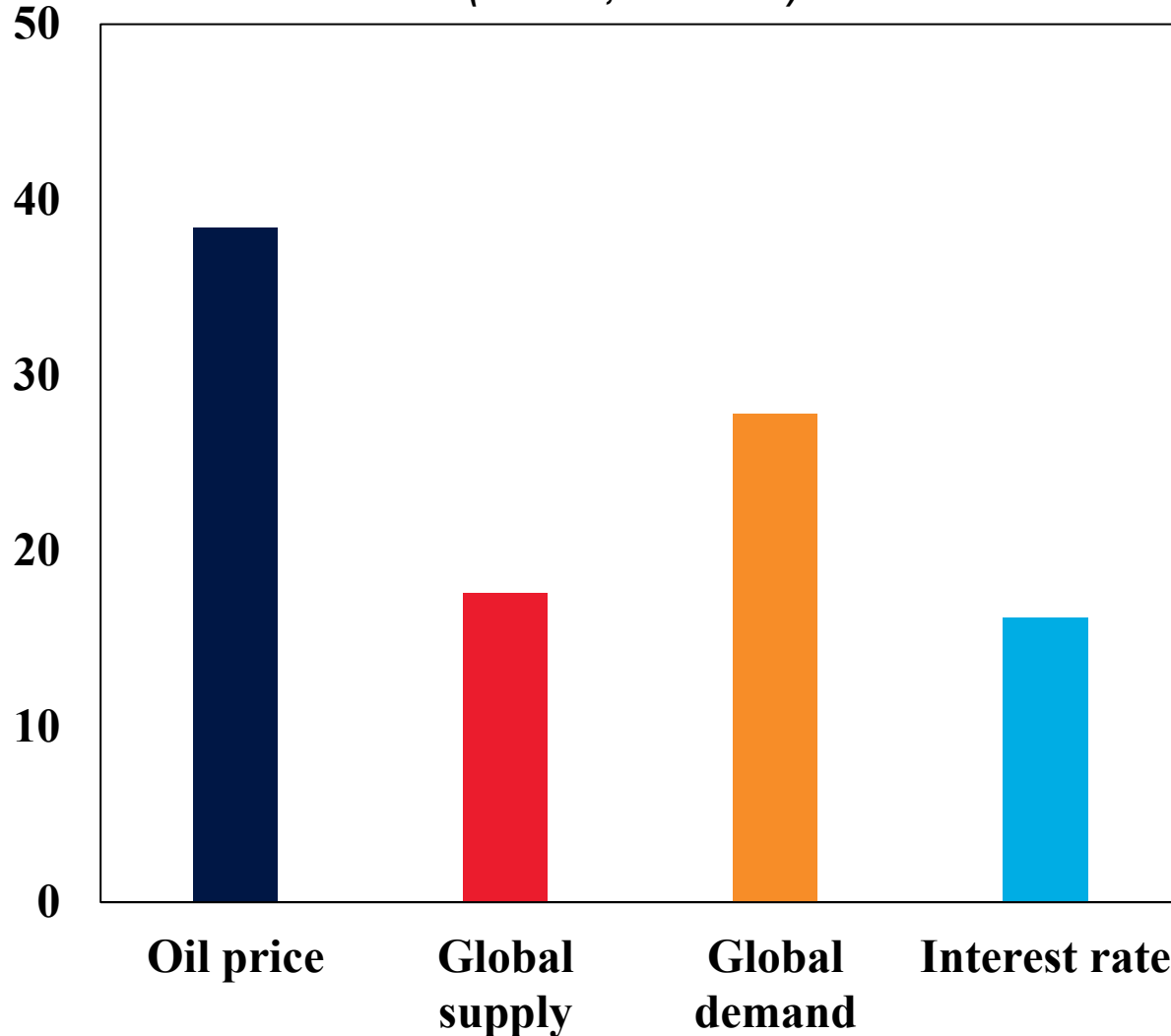**Global inflation factor**
*(Percent, month over month)*
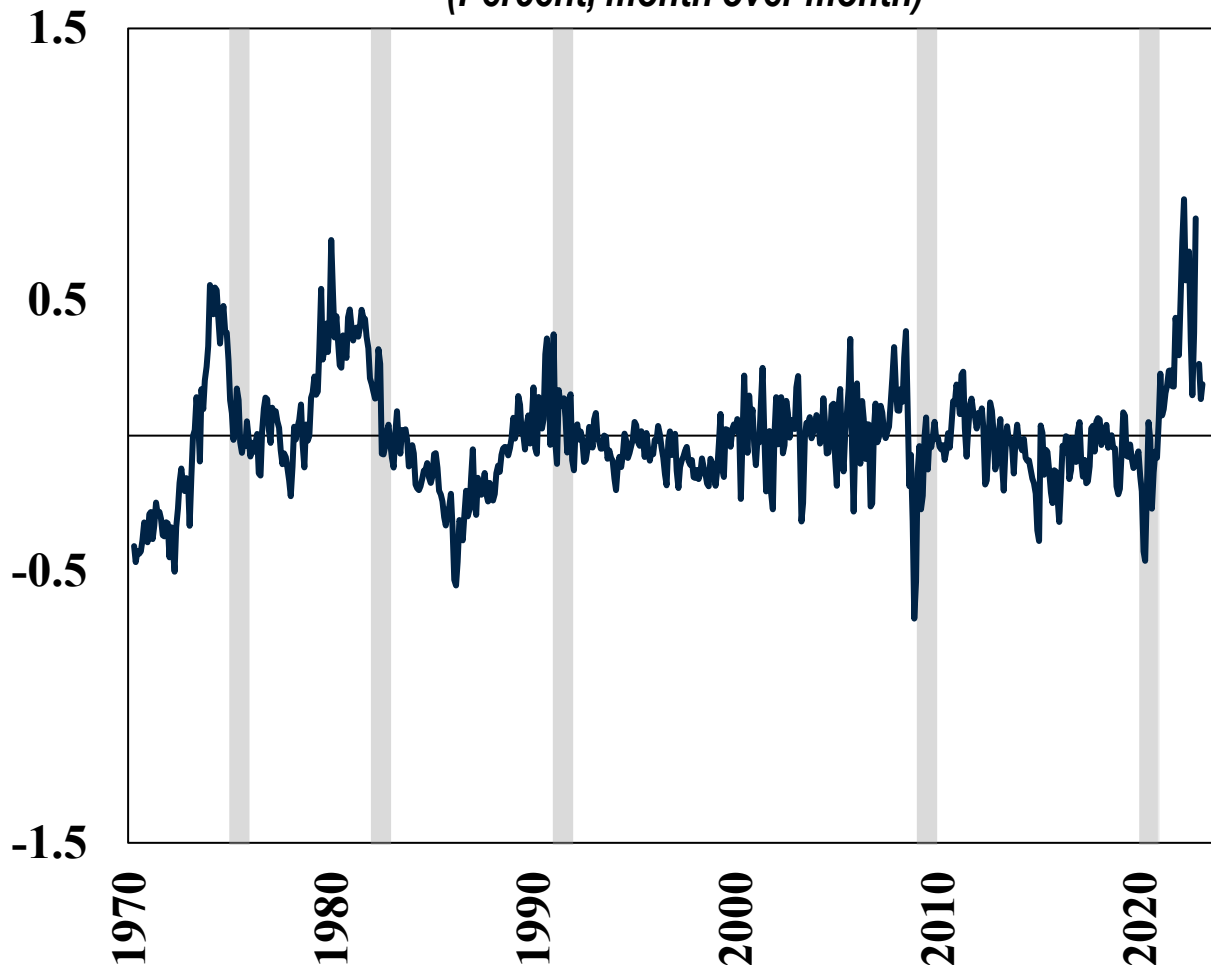
Oil price shocks
(Percent)

Notes: Left Panel. Global inflation factor is de-meaned and estimated using dynamic factor models based month-over-month headline CPI inflation, in G7 countries. Shaded areas indicate global recessions (1975, 1982, 1991, 2009, and 2020). Right Panel. The structural shocks are estimated with the global FAVAR model. Grey-shaded areas indicate global recessions (1975, 1982, 1991, 2009, and 2020) and red-shaded areas indicate periods of oil price spikes (1974, 1978-80, 1990, 2008). Orange-shaded areas indicate periods of oil price plunges (1985-86, 1990-91, 1997-98, 2001, 2007-09, 2014-16, and 2020). The first (last) observation in both panels is 1970m4 (2022m10)

Drivers of Global Inflation

Variance share of global inflation explained by global shocks
(Percent, 1970-2022)

Impact of global shocks on global inflation
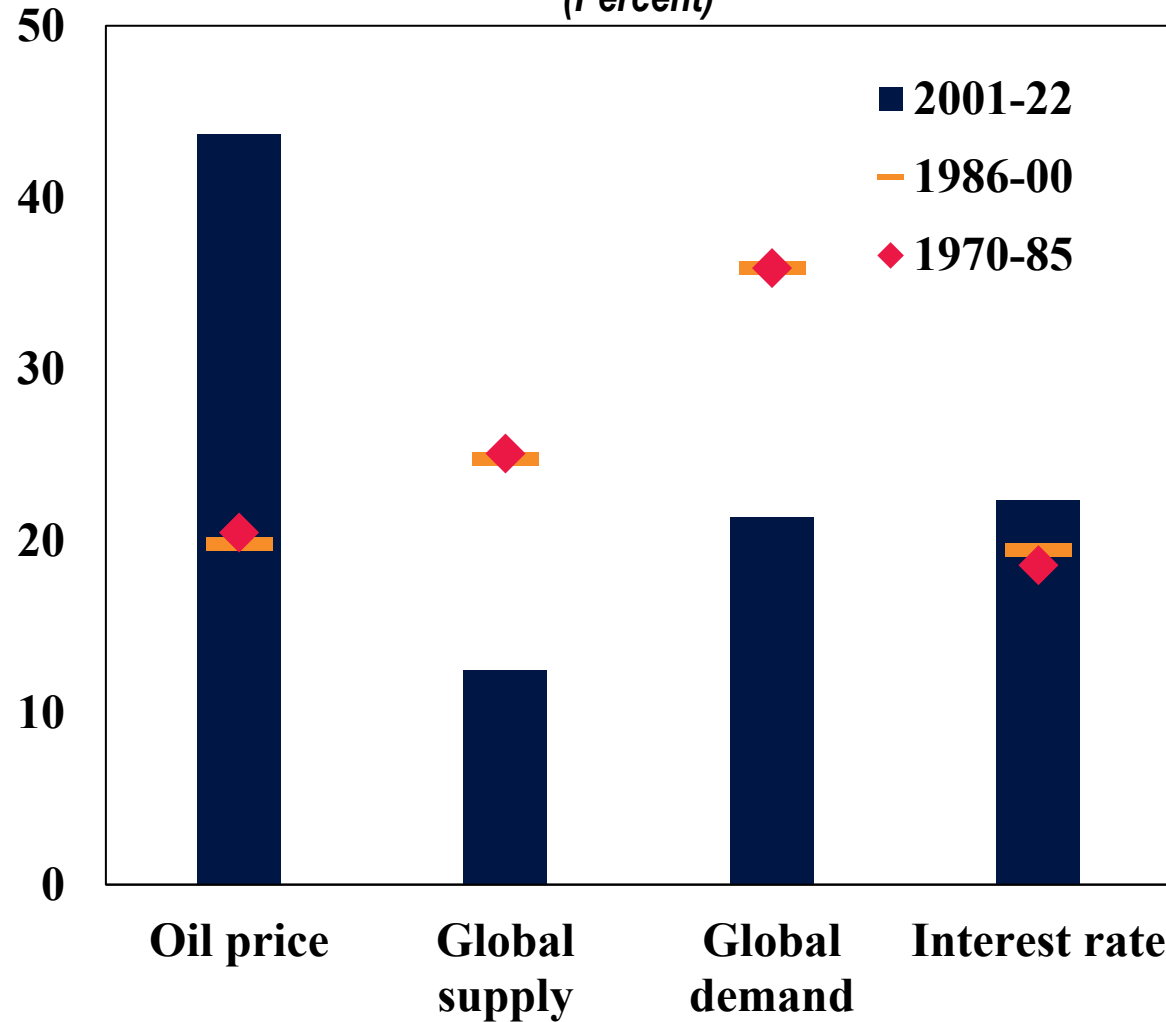*(Percentage point, 1970-2022)*
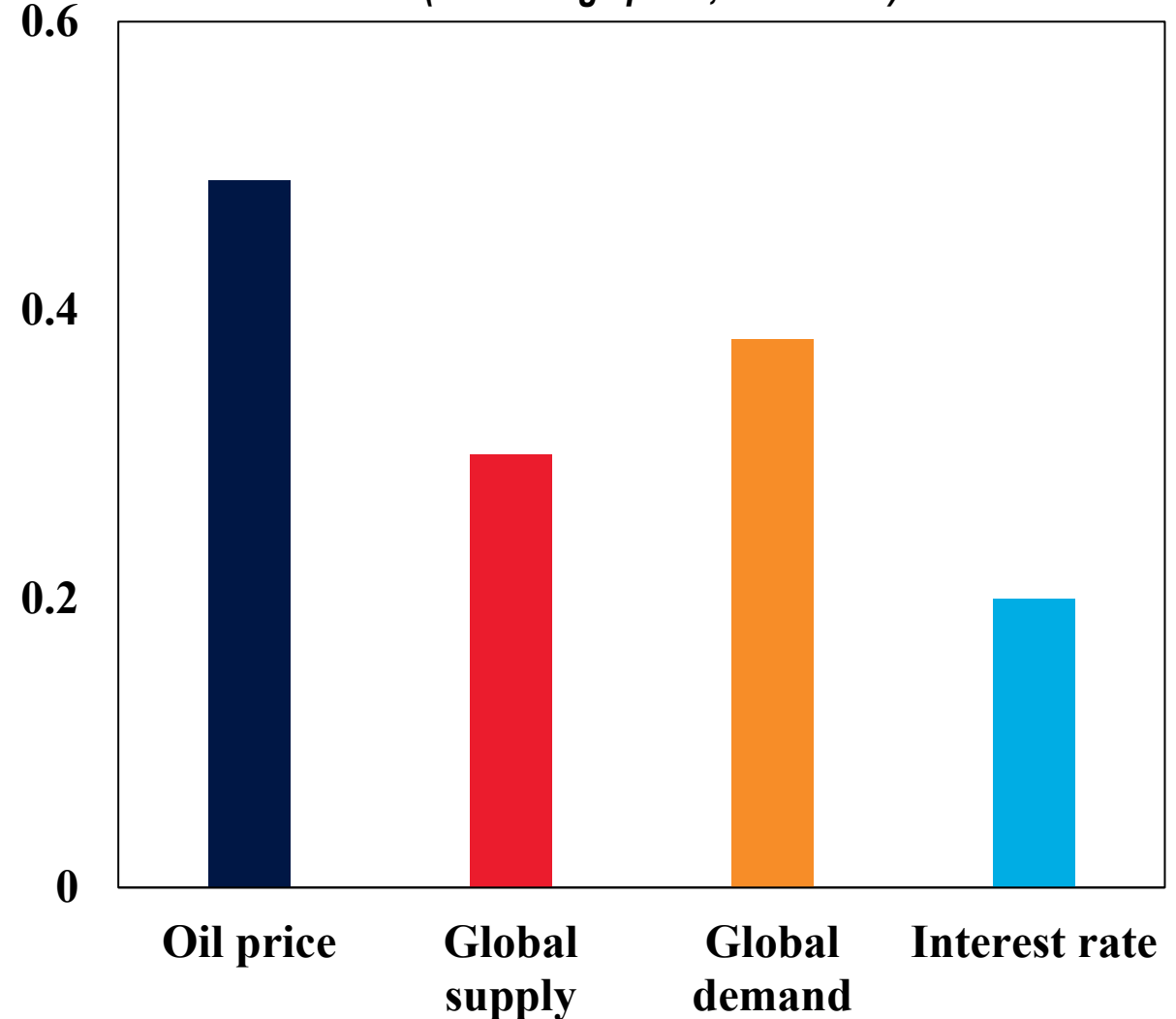
Note. Forecasts error variance share of global inflation explained by global shocks (left) and impulse response functions of global inflation following one-standard-deviation shocks (right) based on the global FAVAR model, estimated for G7 countries for 1970-2022. Both results are based on a two-year forecasting horizon.
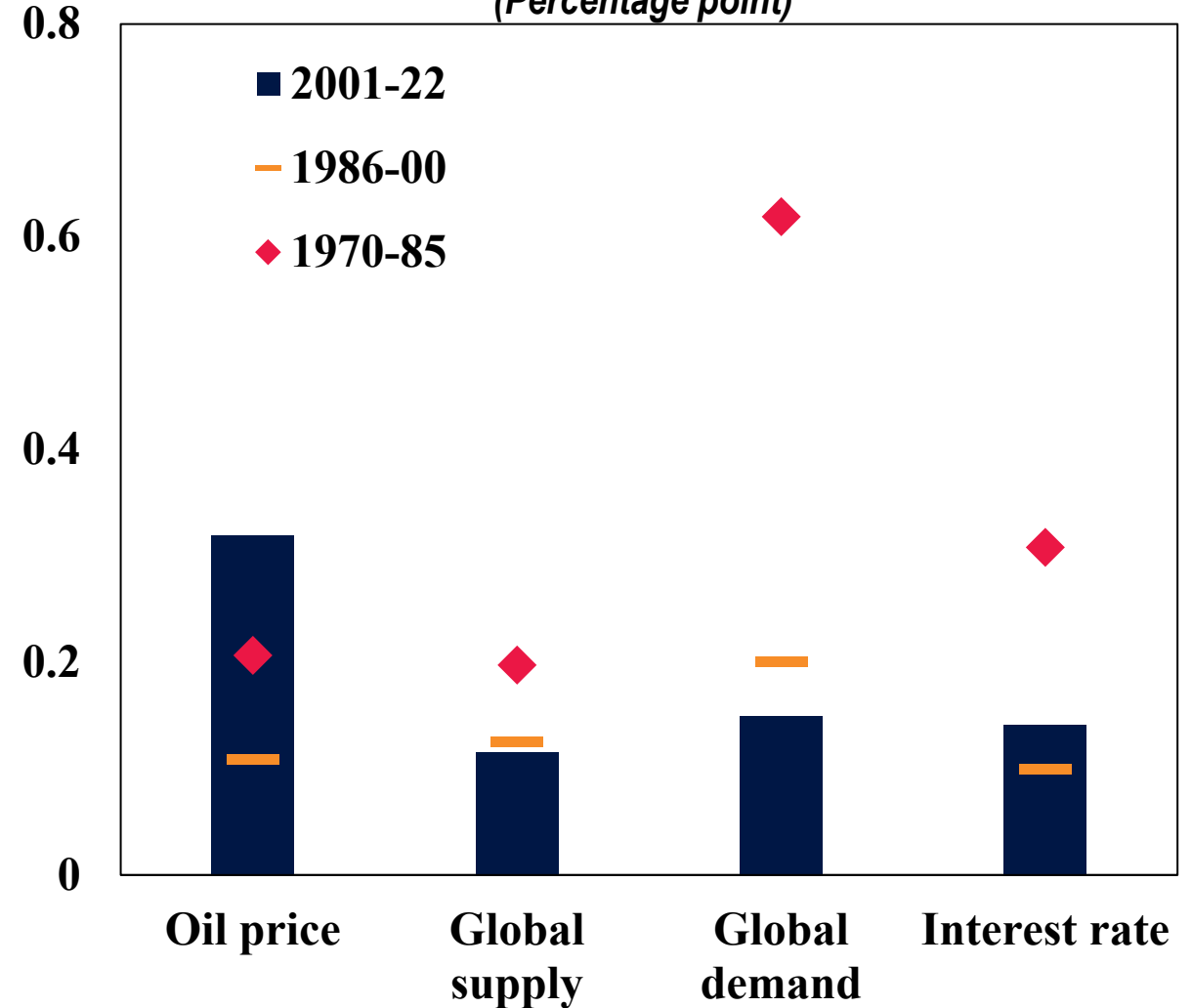
Drivers of Global Inflation over Time

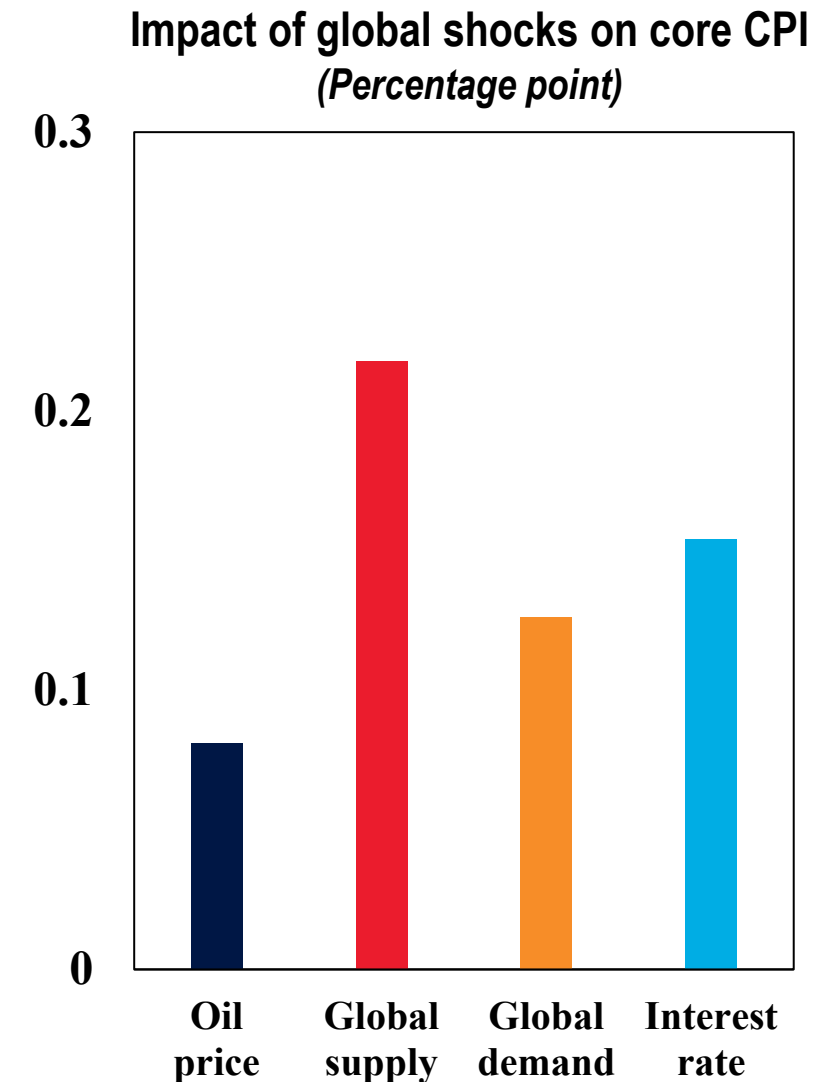**Variance share of global inflation explained by global shocks**
(Percent)

Legend:
- 2001-22
- 1986-00
- 1970-85

Categories: Oil price, Global supply, Global demand, Interest rate

Impact of global shocks on global inflation
(Percentage point)

Legend:
- 2001-22
- 1986-00
- 1970-85

Categories: Oil price, Global supply, Global demand, Interest rate

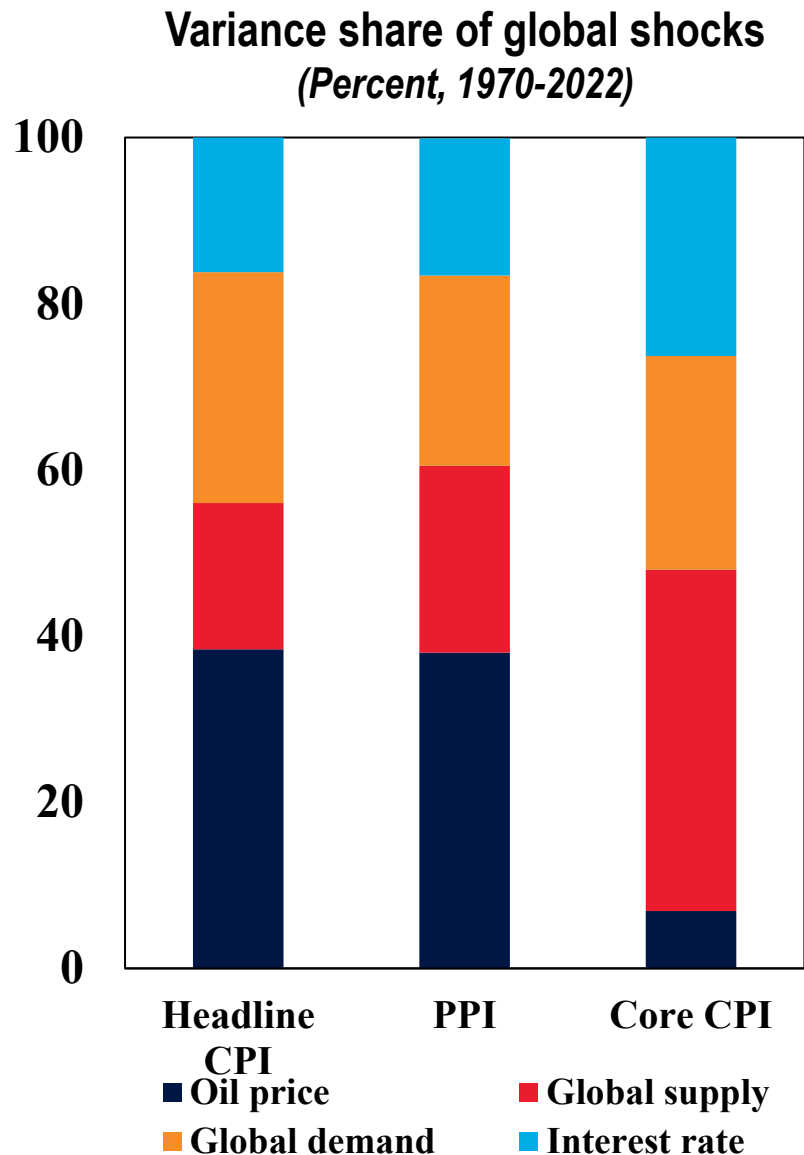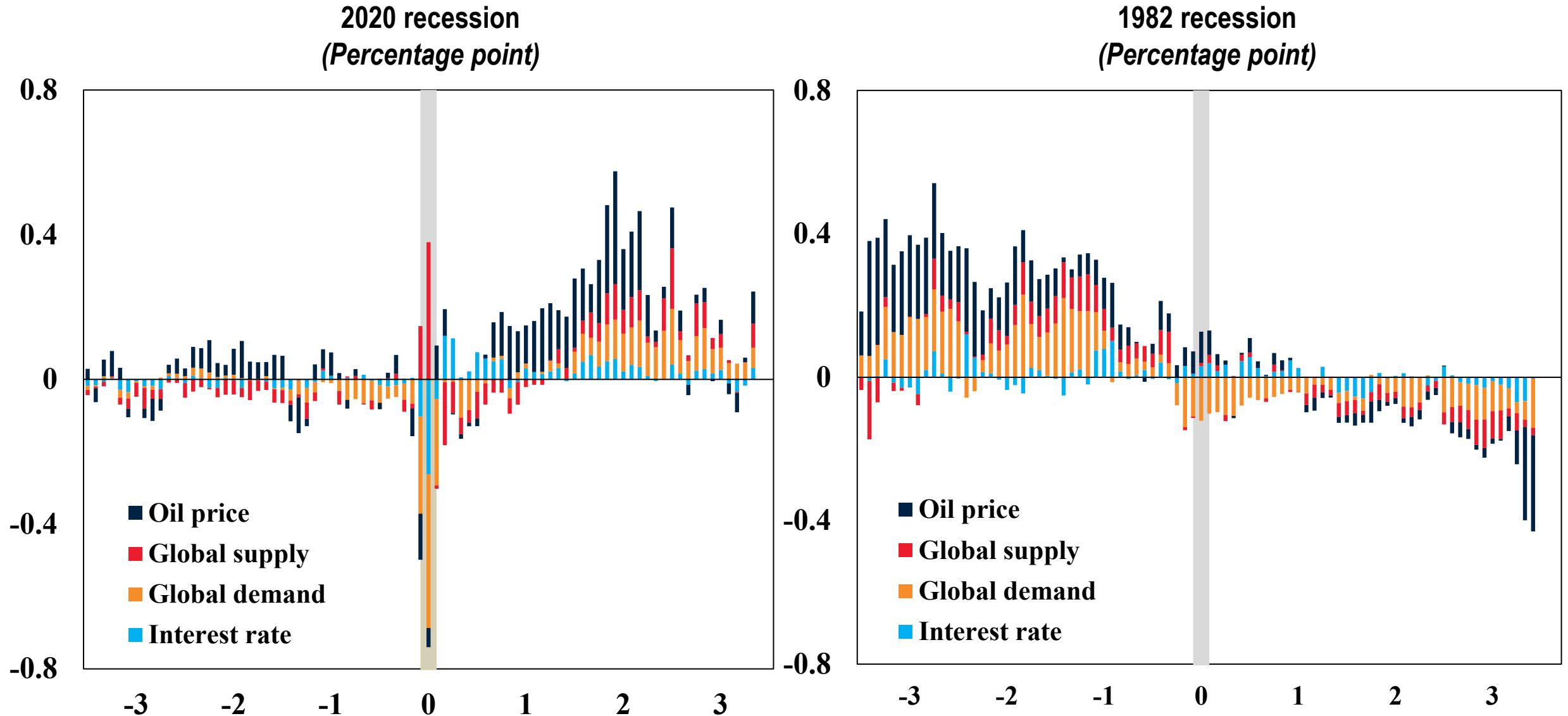Note. Forecasts error variance share of global inflation explained by global shocks (left) and impulse response functions of global inflation following one-standard-deviation shocks (right) based on the global FAVAR model, estimated for G7 countries for the corresponding three sub-samples. Both are based on a two-year forecasting horizon.

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Drivers of Global PPI and Core CPI Inflation

Variance share of global shocks *(Percent, 1970-2022)*

Impact of global shocks on PPI *(Percentage point)*

Impact of global shocks on core CPI *(Percentage point)*

Oil price · Global supply · Global demand · Interest rate
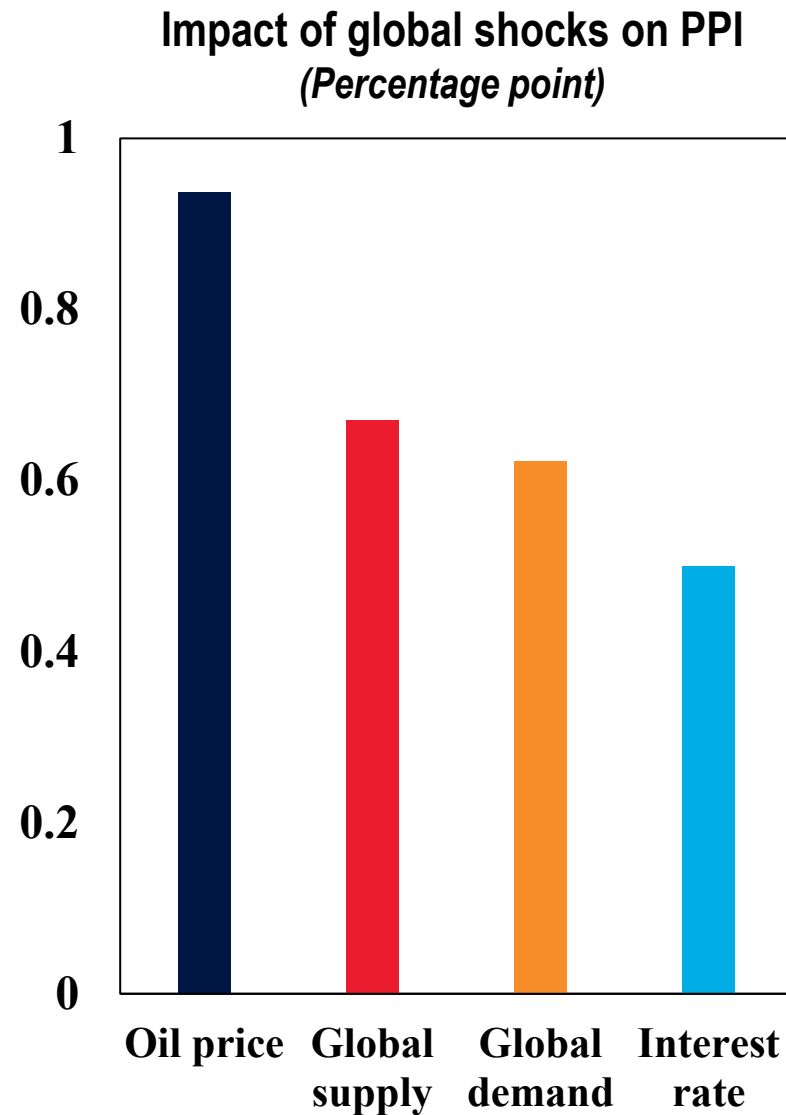
Note. Forecasts error variance share of global shocks for global inflation (left) and impulse response functions of global inflation following one-standard-deviation shock (middle and right) based on the global FAVAR model with different measures of global inflation, estimated for G7 countries for 1970-2022. Both types of results are based on a two-year forecasting horizons.

Decomposition of Global Inflation (*Level*)

2020 recession
(Percentage point)

1982 recession
(Percentage point)

Legend:
- ■ Oil price
- ■ Global supply
- ■ Global demand
- ■ Interest rate

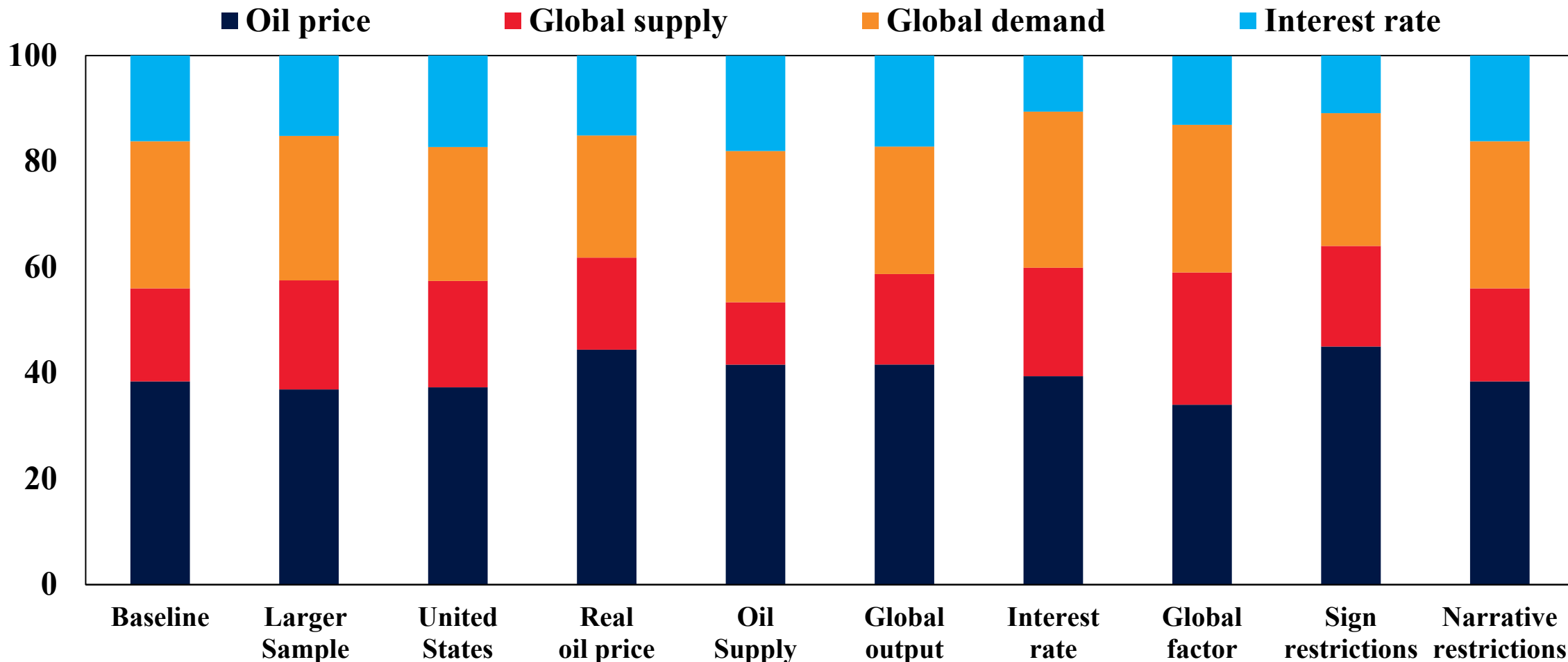Note. Historical decompositions of global shocks to inflation based on the global FAVAR model. The horizontal axis indicates years and the shaded areas indicate global recessions (1982 and 2020). All variables are seasonally adjusted and de-meaned. In the left panel, the last (first) observation is August 2023 (April 2017). In the right panel, the last (first) observation is October 1985 (October 1979).

Robustness Exercises - 1

- ***Country groups and weighting schemes.*** 30 countries; the United States; and a weighted average and a simple average (of inflation, output, and interest rates) of G7 countries.

- ***Narrative restrictions.*** Additional restrictions to capture recent developments.

- ***Measures of global indicators.*** Real oil prices; nominal energy prices; global economic conditions index; and world industrial production index.

- ***Decomposition of oil price shocks.*** Oil-supply and oil-demand shocks

- ***Sub-sample periods.*** Sub-samples with equal size (1970-87, 1988-2005, and 2006-2023) and 5-year rolling estimation

Robustness Exercises - 2

Variance share of global inflation explained by global shocks
(Percent, 1970-2022)

■ Oil price　■ Global supply　■ Global demand　■ Interest rate

Categories (x-axis): Baseline, Larger Sample, United States, Real oil price, Oil Supply, Global output, Interest rate, Global factor, Sign restrictions, Narrative restrictions

Notes: Forecasts error variance share of global shocks for global inflation using alternative types of models for 1970-2022."Larger sample" and "U.S." indicate the database is based on 30 countries and the United States, respectively. "Real oil price" indicates that the nominal oil prices are replaced by real oil prices (deflated by US CPI). "Oil supply" indicates that the model identifies both oil production and demand shocks instead of oil price shocks. "Global output" and "Interest rate" indicate that the global output and interest rate measures are replaced by alternative measures of the global variables. "Global factor" indicates that global inflation, output, and interest rest rate measures are estimated using a simple average of G7, instead of global factors. "Sign restrictions" and Narrative restrictions" indicate the model that considers additional sign and narrative restrictions, respectively.

Conclusion

- **What have been the main drivers of global inflation over the past half-century?**

  Oil price shocks were the main drivers of variation in global inflation, followed by demand shocks during 1970-2022.

- **How have the roles of these drivers changed over time?**

  Oil price shocks have become more prominent in explaining global inflation over time whereas the importance of demand and supply shocks has declined.

- **How important have these drivers been for the global core and PPI inflation?**

  Global core inflation was mainly driven by supply shocks while global PPI inflation was mostly driven by oil price shocks.

Looking Forward…

- **Near-term global inflation prospects.** All drivers of global inflation in our model are nowadays moving in the direction of lowering global price pressures implying that global inflation will likely continue to come down in the coming months…

- **Medium-term global inflation prospects.** Good reasons to worry about the global economy will experience higher inflation over the medium term than the level prior to the pandemic *"One must acknowledge that any pronounced or widespread relapses in the relatively favorable backdrop of globalization, deregulation, productivity increase and relatively benign fiscal policies could begin to rollback the extraordinary achievement of recent years."* Kenneth Rogoff (2003)

- **Global inflation.** Fertile area of research…

Thanks