Heaven or Earth?
The Evolving Role of Global Shocks for Domestic Monetary Policy

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Motivation

... if you know Heaven and know Earth, you may make your victory complete...

Sun Tzu (5th century BC)

Chinese military strategist, philosopher and author of The Art of War

In this era of hyperglobalisation, are central banks still masters of their domestic monetary destinies? Or have they become slaves to global factors?

Mark Carney (2015)

Prime Minister of Canada, former Governor of BoE and BoC

Motivation

- **Has the nature of the shocks driving monetary policy changed?**
  - Has the role of global vs. domestic shocks changed over time?
  - Do global shocks have different characteristics (and generate different monetary policy responses) than domestic shocks?

- **If the answer is "yes" to both questions, widespread implications for monetary policy**
  - Forecasting models usually do not differentiate between global/domestic sources of shocks, often focus on linear & symmetric demand shocks
  - Consider adjustments to monetary policy frameworks & communication strategies

Methodology

- **Focus on 13 advanced economies over 55 years (1970-2024)**
- **Main methodology: new factor-augmented vector autoregressive model (FAVAR) that identifies distinct roles played by 7 different shocks to explain fluctuations in interest rates**
  - 4 global shocks (oil prices, demand, supply, monetary policy)
  - 3 domestic shocks (demand, supply, monetary policy)
  - Also explain fluctuations in inflation and output growth
- **Richer decomposition and more granular analysis than in past work**

Key Results

1. **Has the role of global shocks changed over time? YES**
   - Role has roughly tripled over time for interest rates
   - To explain about half of variation in interest rates over 2020-24
2. **Are the characteristics of global shocks different than comparable domestic shocks? YES, across all 5 dimensions examined**
   - **Source** of shock
   - **Variance** of shock (even controlling for source)
   - **Country sensitivity** of rate adjustments to shock (even controlling for source)
   - **Asymmetry** for tightening/easing monetary policy
   - Central bank willingness to "**look through**" impact of supply shocks on inflation

- **Overall: Global shocks are different than domestic shocks on multiple dimensions, should better incorporate when setting monetary policy**

Related Literature

1. **Growing role of global factors to domestic macroeconomic variables**
   - Miranda-Agrippino & Rey (2020), Forbes (2019), Ha, Kose & Ohnsorge (2019), Ciccarelli & Mojon (2010), Obstfeld & Taylor (2004), many others…
2. **Identification & decomposition of sources of business cycles**
   - Harding & Pagan (2002), Madeira et al. (2023), Giannone & Primiceri (2024), many others….
   - Literature rarely differentiates between global & domestic shocks
3. **DSGE models of macro impact of different types of shocks**
   - Adolfoson et al. (2007), Monacelli (2004), Corsetti et al. (2010), many others…
   - Shocks often modelled as linear and symmetric, despite recent evidence…
4. **Debate on relative importance of demand and supply shocks to post-pandemic inflation**
   - Ball et al. (2022, 2025), Bernanke & Blanchard (2024), Coibion & Gorodnichenko (2024), Di Giovanni et al. (2023), Gagliardone & Gertler (2023), Ha et al. (2024)

Outline

I. **Methodology and data**

II. **Has the role of global shocks for monetary policy changed over time?**

III. **Do these global shocks differ from domestic shocks across five dimensions?**

1. Source of shock
2. Volatility
3. Country sensitivity
4. Asymmetries (direction for interest rates)
5. “Looking through”

IV. **Extensions (if time): individual economies & robustness tests**

V. **Conclusions and implications for monetary policy**

I. Methodology & Data

Factor-Augmented VAR (FAVAR) Model

$$B_0 Z_t = \alpha + \sum_{i=1}^{L} B_i Z_{t-i} + \varepsilon_t \qquad \varepsilon_t \sim N(0, \sum_t),$$

Z_t: 7 variables - global interest rates, global inflation, global output growth, oil price growth, **domestic interest rates, domestic inflation and domestic output growth**

ε_t is a vector of orthogonal structural innovations, with 7 shocks:

- 4 global shocks: (1) global monetary policy (2) the global demand ; (3) global supply; and (4) oil prices
- 3 domestic shocks (1) domestic monetary policy; (2) domestic demand; (3) domestic supply

Model assumptions and estimation:

- **Monthly data** with 4 lags; Gibbs sampling, **limited availability for some data in early years**
- Stochastic volatility of the structural shocks
- Shocks are independently (but not identically) distributed across time
- Identification using sign and zero restrictions, building on literature on drivers of inflation and monetary policy
- Related research: Smets & Wouters (2007) ; Del Negro et al. (2013, 2022); Uhlig (2005, 2017); Antolin-Diaz & Rubio-Ramirez (2018); Akinci et al. (2025)

Identification

$$\begin{bmatrix} u_t^{R,global} \\ u_t^{y,global} \\ u_t^{\pi,global} \\ u_t^{op,global} \\ u_t^{R,domestic} \\ u_t^{y,domestic} \\ u_t^{\pi,domestic} \end{bmatrix} = \begin{bmatrix} + & + & * & * & 0 & 0 & 0 \\ - & + & + & - & 0 & 0 & 0 \\ - & + & - & + & 0 & 0 & 0 \\ * & + & + & + & 0 & 0 & 0 \\ * & * & * & * & + & + & * \\ * & * & * & * & - & + & + \\ * & * & * & * & - & + & - \end{bmatrix} \begin{bmatrix} \varepsilon_t^{GMonPolicy} \\ \varepsilon_t^{GDemand} \\ \varepsilon_t^{GSupply} \\ \varepsilon_t^{GOilPrice} \\ \varepsilon_t^{DMonPolicy} \\ \varepsilon_t^{DDemand} \\ \varepsilon_t^{DSupply} \end{bmatrix}$$

- * = unrestricted initial response.
- Domestic shocks do not affect global variables contemporaneously.
- Global shocks can affect domestic variables without any sign or zero restrictions
- Based on: Uhlig (2005, 2017), Madeira, Madeira, & Monteiro (2023), Dees et al. (2010), Gerlach & Smets (1995); Ha et al. (2024); Melolinna (2015); Charnavoki & Dolado, (2014)

Data

- **Monthly data for 1970(Jan) through 2024 (Sept)**
- **13 advanced economies (including euro area as 1 entity)**
  - Focus on averages across sample (individual results at end)
  - Repeated analysis with 24 economies (including individual EA members)
- **Key data**
  - **Interest rates: shadow rate** (Krippner, 2013), backups: overnight rates, 3-month t-bills, policy rate
  - **Inflation**: based on CPI price index
  - **Output**: industrial production
  - **Oil prices**: average of Dubai, West Texas Intermediate and Brent benchmarks
  - **All variables month-on-month, demeaned and stationary**
  - Source of above: Haver, OECD, World Bank
- **Also calculate global factors for interest rates, inflation and output growth**

Global Factors

- **Dynamic factor model to estimate global common factors for each country *i* in month *t* for**

  Interest rates: $R_t^i = \beta_{global}^{R,i} f_t^{R,global} + e_t^{R,i}$

  Inflation: $\pi_t^i = \beta_{global}^{\pi,i} f_t^{\pi,global} + e_t^{\pi,i}$

  Output growth: $Y_t^i = \beta_{global}^{\pi,i} f_t^{Y,global} + e_t^{Y,i}$

- Using monthly data (previous slide)
- Used as inputs for baseline FAVAR model
- Also used to compare to results on role of global shocks

Windows for Analysis

- **Five long windows for baseline analysis**
  - ***1970-84:*** 2 global recessions; oil price shocks
  - ***1985-98:*** 1991 global recessions and series of debt defaults and EM crises
  - ***1999-07:*** ECB launches; tech bubble & 2001 global downturn, lead up to the 2008 GFC
  - ***2008-19:*** GFC & global recession, EA debt crisis, and oil price collapse
  - ***2020-24****:* COVID-19 pandemic and global recession, the Russian invasion of Ukraine and commodity price shock
- **Decades for some comparisons**

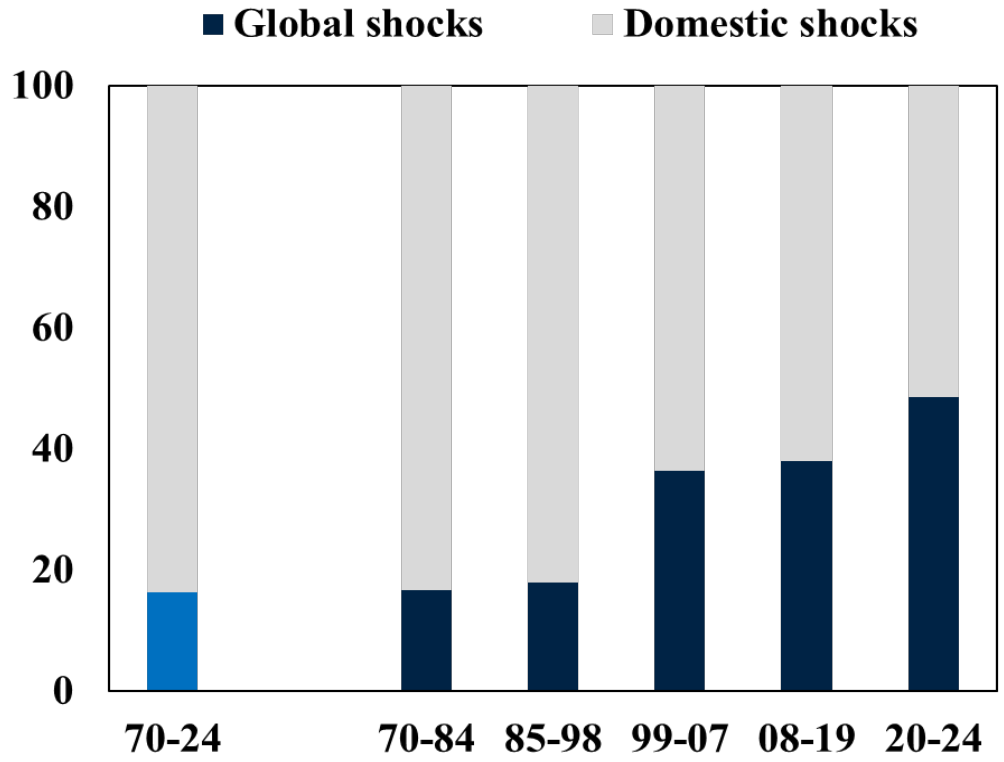
II. Has the Role of Global Shocks for Monetary Policy Changed Over Time?

Has the Role of Global Shocks Changed over Time?

Results from FAVAR model

Contributions of Shocks to Interest Rate Variation

(% of variation, mean across 13 AEs)



YES

Role of global shocks has increased over time

- Roughly tripled over sample

Over 2020-24:

- Role of global ≅ domestic shocks
- Role of global shocks >50% in many large AEs (Canada, EA, Japan, UK, US)

Does this Matter?

- **Maybe not….**
- **Unless global shocks have different characteristics and/or different implications for monetary policy….**

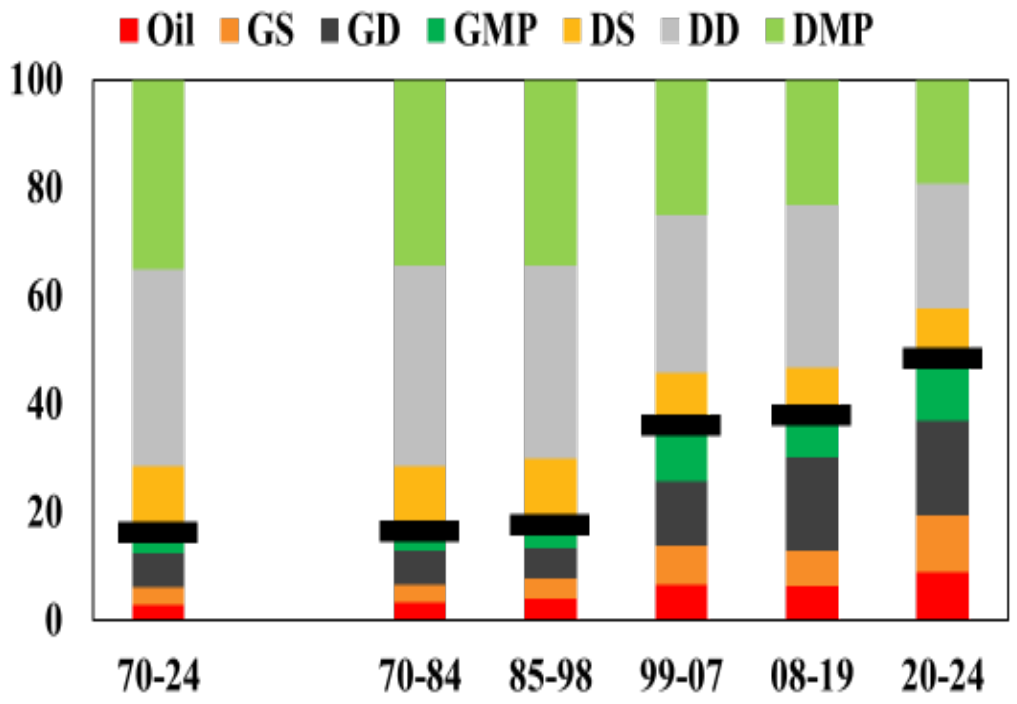
III. Do the Global Shocks Differ from Domestic Shocks along 5 Dimensions?

1 Different Sources?

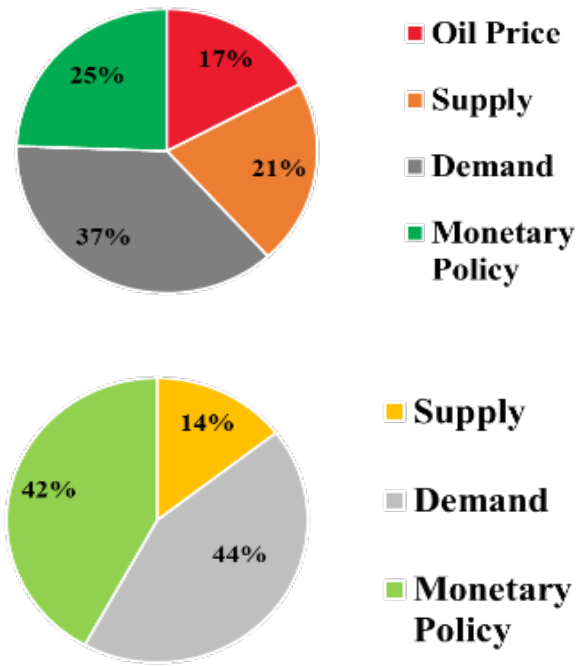
for Global vs. Domestic Shocks to Interest Rates

Contribution of 7 Shocks to Variation in Interest Rates

(% of variation, mean across 13 AEs)



1970-24



YES

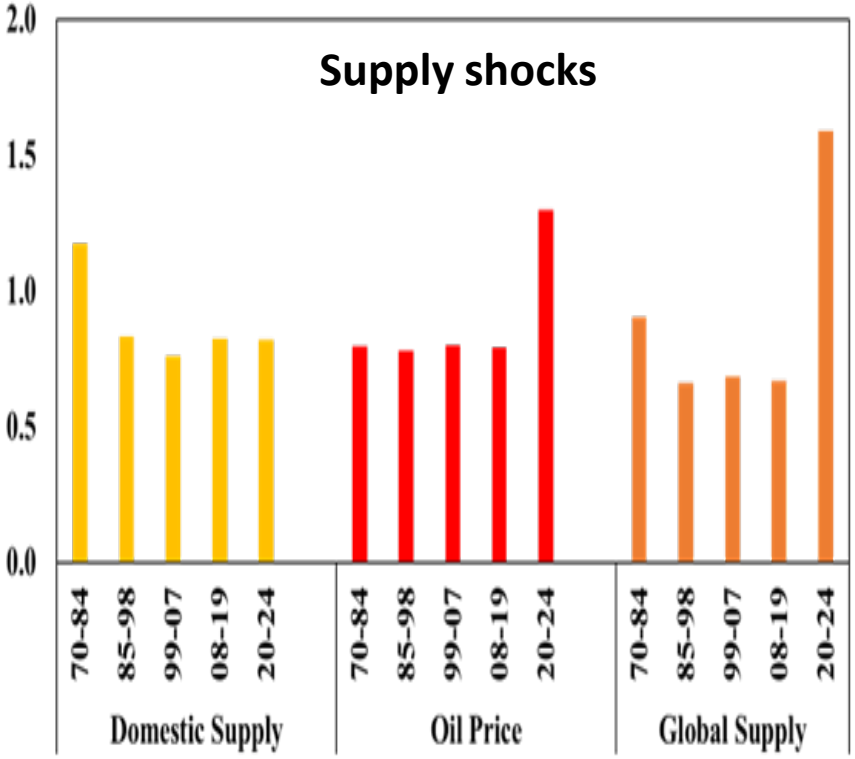
- Larger role of **supply in global shocks**
- Larger role for **monetary policy in domestic shocks**

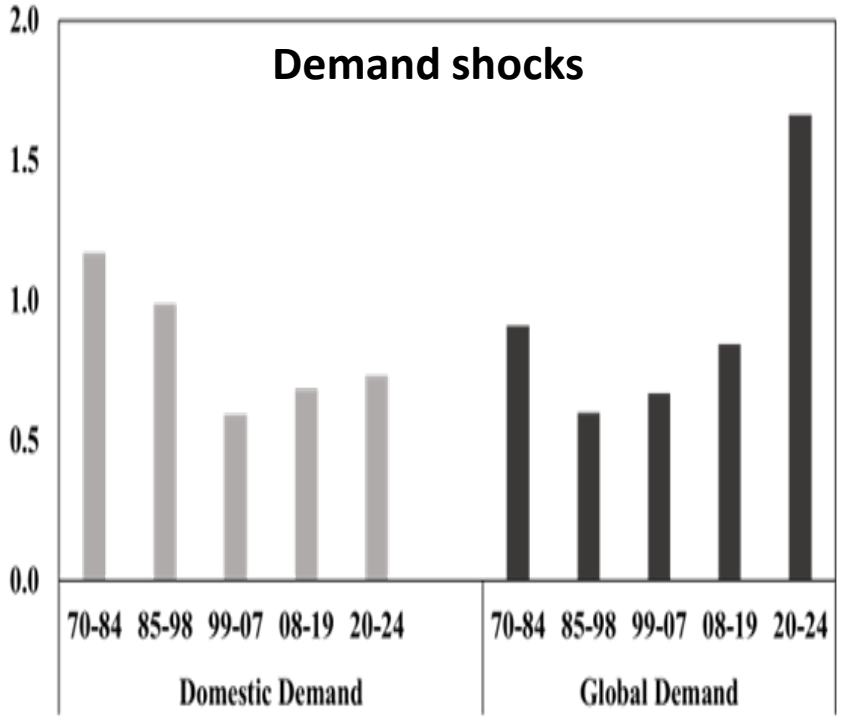
2 Different Volatilities?

of Global vs. Domestic Shocks to Interest Rates

Shock volatility

(mean across 13 AEs, long-term volatility = 1)





YES

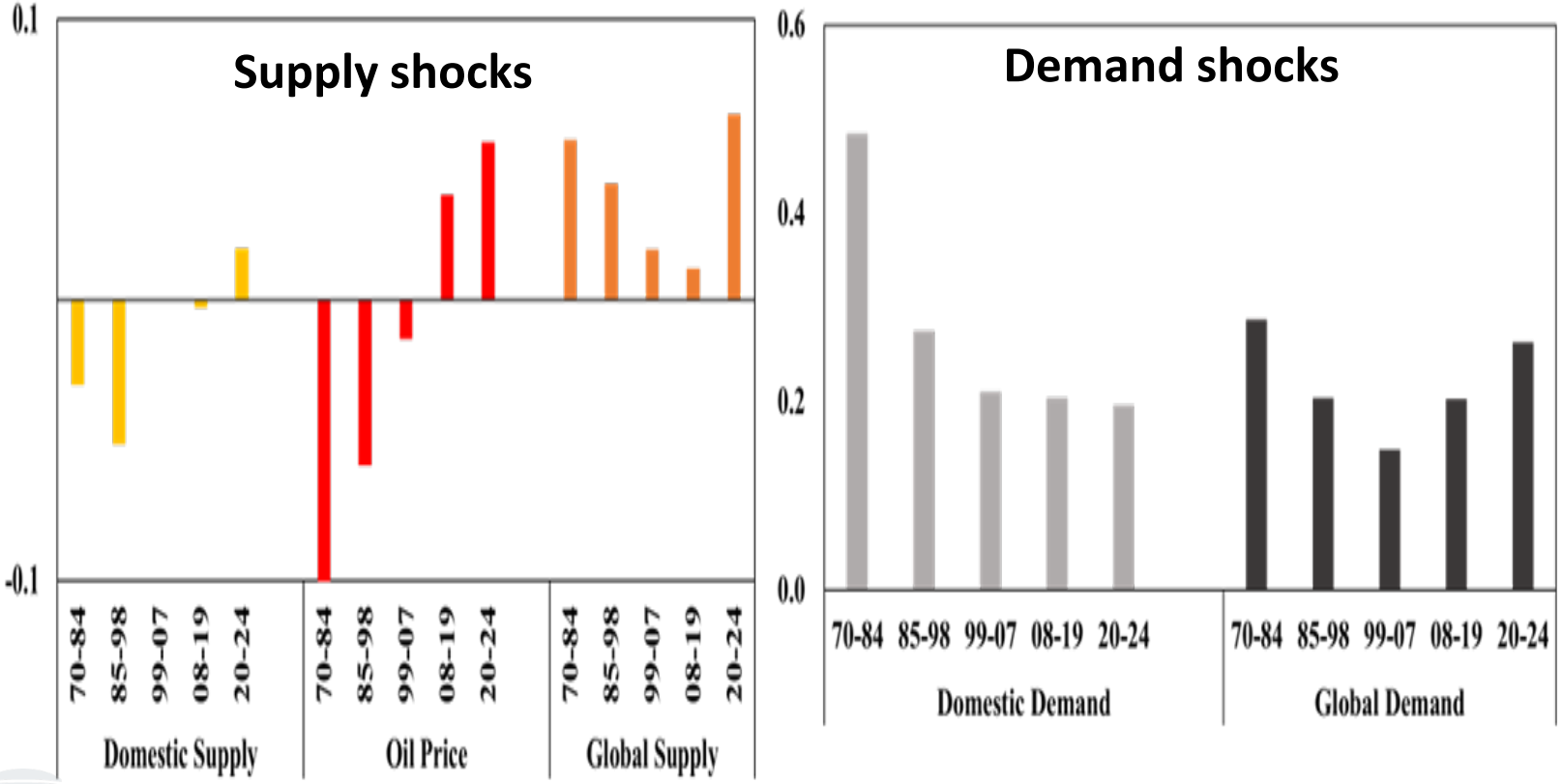
- **Global shock volatility ↑ over time**
- Recently higher than domestic shocks
- Note: may reflect idiosyncratic 2020-24 period

3 Different Rate Sensitivities?

of Interest Rates to Global vs. Domestic Shocks

Sensitivity of Interest Rates to Different Shocks

(mean across 13 AEs, sensitivity to 1 std shocks)



YES

Sensitivity of interest rates to main global shocks (supply & demand)

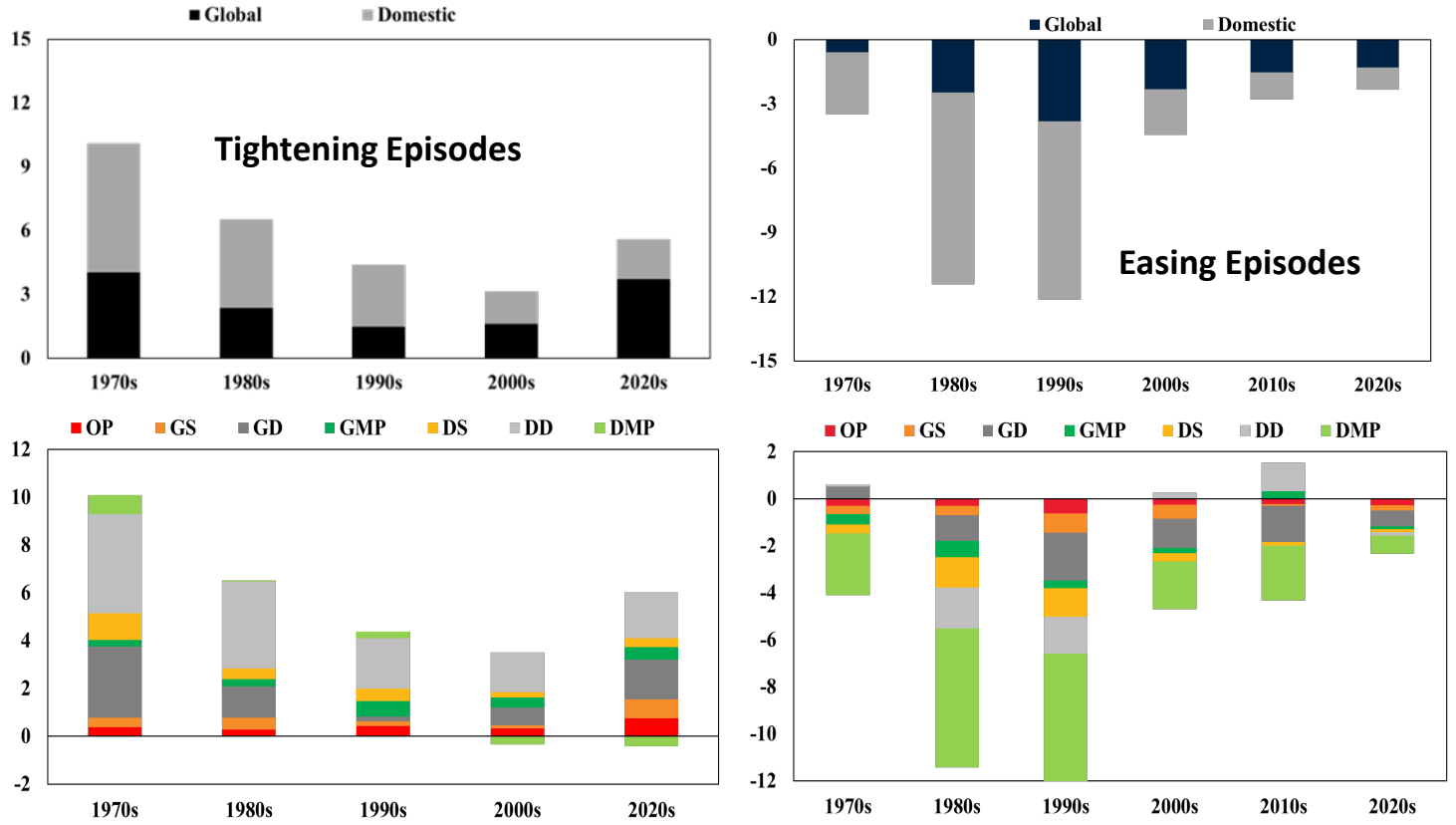
- **higher over 2020-24**
- **increased over time**

4 Asymmetric Effects on Rate Levels?

in Contribution of Global vs. Domestic Shocks

Impact on Level of Interest Rates

(in percentage points, average across 13 AEs)



YES

- **Global shocks relatively more important for tightening monetary policy**
- **Asymmetry by shock source:**
  - Global supply shocks more important for i↑
  - Domestic monetary policy shocks for i↓

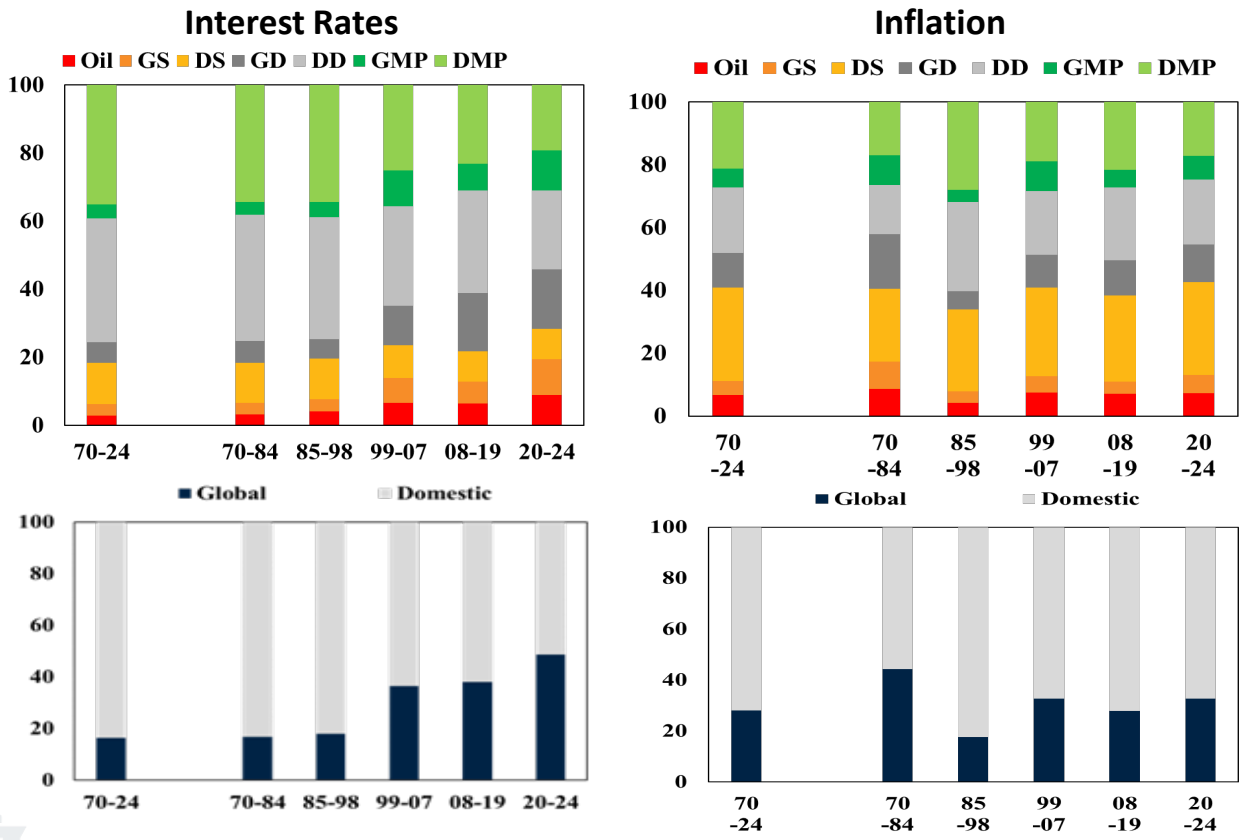
Note: based on Forbes, Ha and Kose (2025), "Tradeoffs over Rate Cycles: Activity, Inflation and the Price Level", NBER Macroannual

5 CB Willingness to "Look Through"?

Impact on Inflation from Global vs. Domestic Shocks

Contribution of 7 Shocks to Variation in Rates & Inflation

(% of variation, mean across 13 AEs)



YES

- Supply shocks (domestic & global) to inflation "looked through"
  - Holds for domestic supply shocks
- Since 1999:
  - **Global shocks <u>not</u> looked through**
  - **Global shocks more important for rates than inflation (or output growth)**

IV. Extensions

Results for Individual Economies
Robustness Exercises

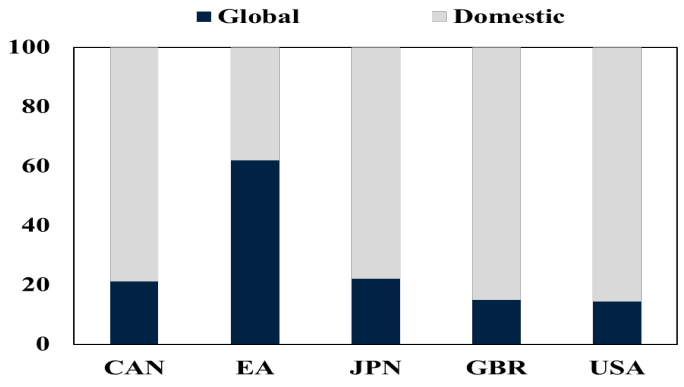
Results for Individual G-5

Contribution of Shocks to Interest Rate Variation

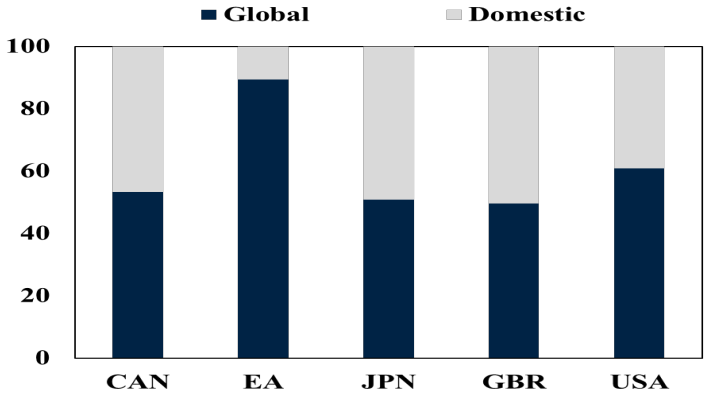
Contribution of 7 Shocks to Variation in Rates & Inflation

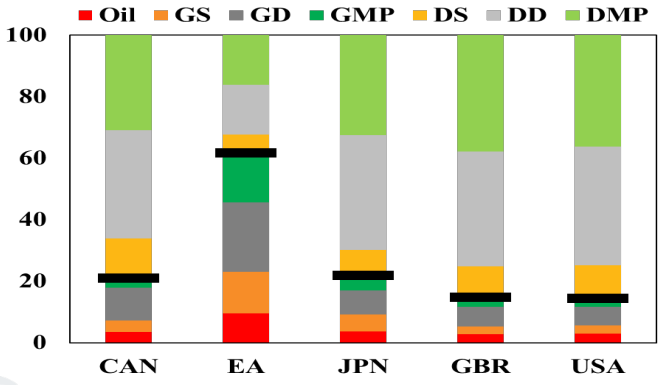
(% of variation)

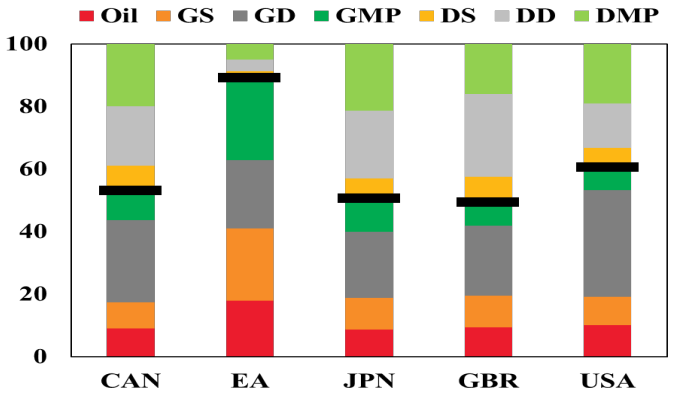
Full Sample Period



Post-Pandemic Period







Meaningful differences across countries

- Euro Area: greater role of global shocks
- Euro area, greater role of global <u>supply</u> shocks

Robustness Exercises

- **Alternative definitions of key global and domestic variables**
  - Alternate measures for interest rates
- **Excluding largest economies**
- **Excluding periods of heightened volatility**
- **Alternative modelling specifications**
  - Time-varying coefficients
  - Alternate identification assumptions
- **Key results robust**
  - Increased role of global shocks over time
  - Five dimensions by which global shocks differ from domestic shocks

V. Conclusions

Summarizing the Answers

1. **Has the role of global shocks changed over time?** **YES**
   - Role has roughly tripled over time for interest rates
   - To explain about half of variation in interest rates over 2020-24
2. **Are the characteristics of global shocks different than comparable domestic shocks?** **YES, across all 5 dimensions examined**
   - Larger supply component
   - Greater variance over recent periods (even controlling for source of shock)
   - Correspond to larger monetary policy responses (i.e., greater country sensitivity)
   - Different asymmetries (greater role in tightening vs. easing in monetary policy)
   - Central banks less willing to “look through” impact of global supply shocks on inflation

Overall: The nature of the shocks driving monetary policy has changed

- Need to better incorporate when setting monetary policy

Implications for Monetary Policy

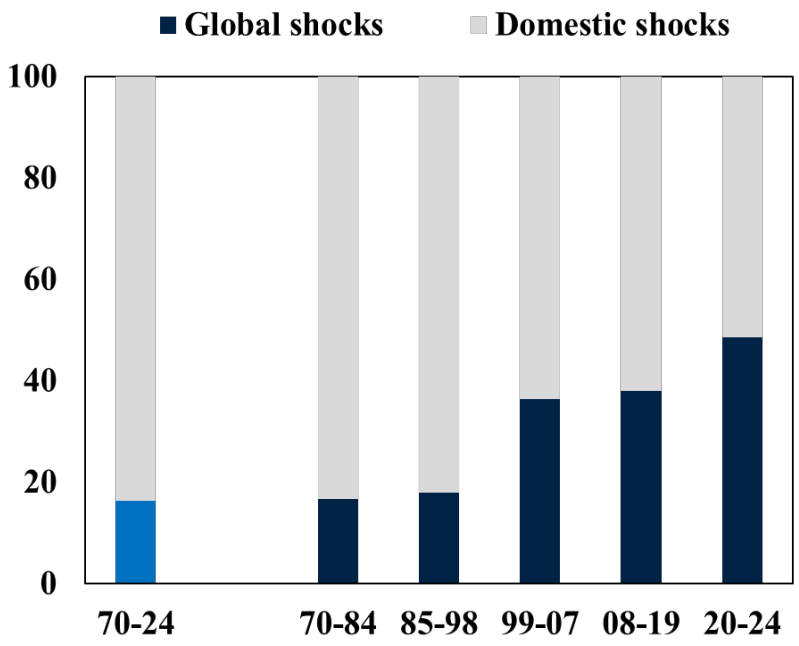
- **How to incorporate greater role of shocks from "heaven" (i.e., outside the control of individual central bank) in monetary policy?**
- **Models:**
  - Better differentiate between global and domestic shocks
  - Allow for asymmetries & non-linearities (with implications for "looking through")
- **Frameworks:**
  - More humility in ability to meet narrow targets at any point in time
  - Support more "forceful" response to certain types of shocks
- **Forecasting and communication:**
  - Incorporate greater uncertainty in global shocks through greater use of scenarios & risk considerations
- **Bottom line (from Sun Tzu): Must understand "heaven and earth" to design a successful battle strategy**

EXTRA

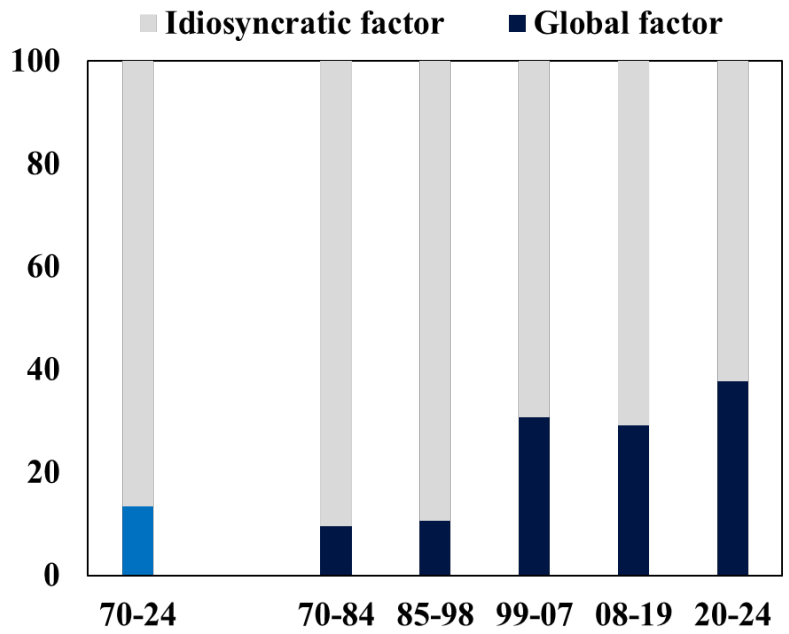
Similar Patterns for Global Factor

Contributions of Global Shocks and Global Factor to the Interest Rate Variation
(% of variation, mean across 13 AEs)

A. FAVAR Model



B. Dynamic Factor Model

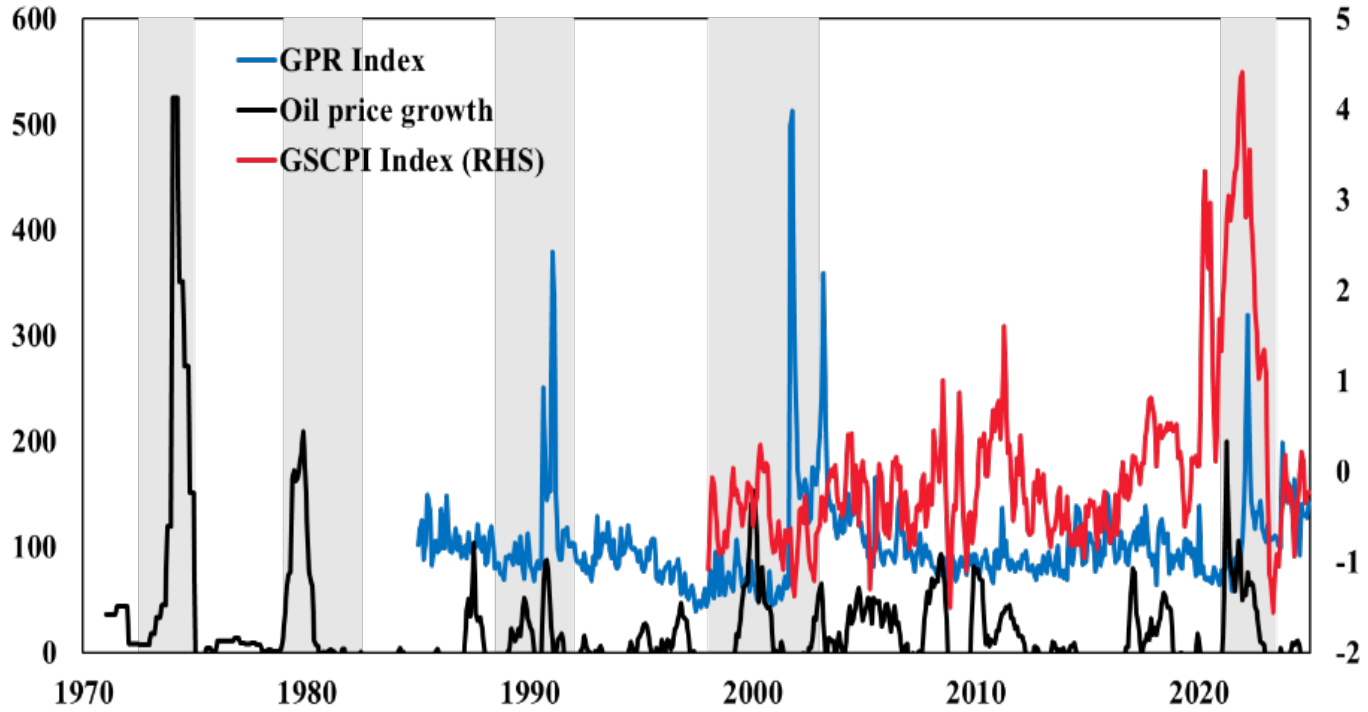


Very similar patterns

- Role of global shocks/factor roughly triples over sample

Which Global Supply Shocks?

Oil prices, geopolitical tensions, global supply disruptions



Focus on 3 measures

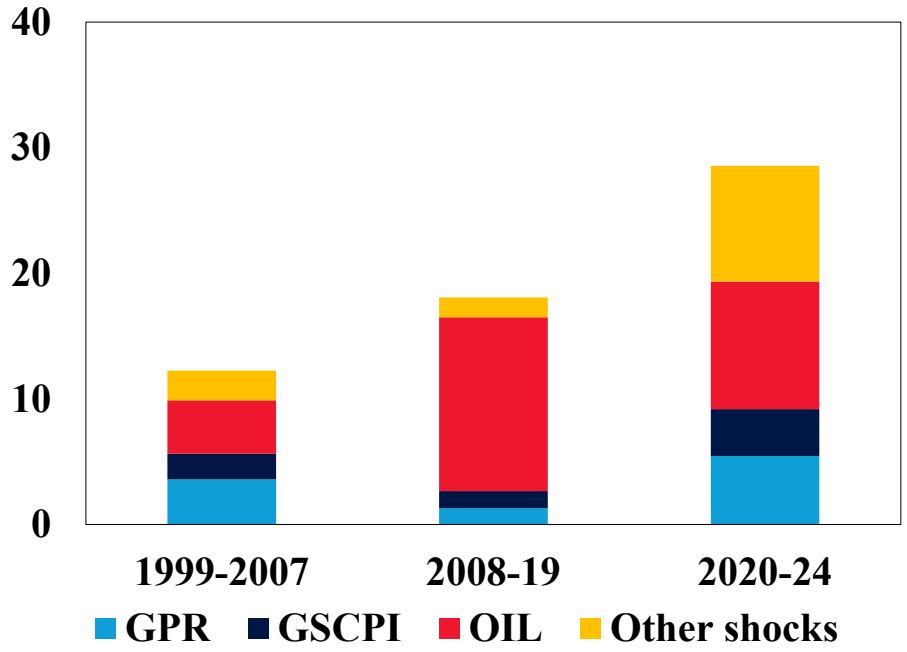
1. Oil prices (inc. other commodities)
2. Geopolitical risk
3. Global supply chain disruptions

Note: Limited time series for some measures

Sources: Federal Reserve of New York, Iacoviello (2022), World Bank (Pink sheet data). Note: GPR index = geopolitical risk index, GSCPI index = supply-disruption index. Oil price growth is based on year-on-year. Shaded areas indicate the periods with persistently positive contributions of supply shocks.

Which Global Supply Shocks?

Variance share of exogeneous global supply-driven shocks: Cholesky FAVAR (Percent of total variation)



Notes: "Oil" = oil price shock, "GPR"= geopolitical risk shock, "GSCPI"=global supply disruption shock, and "other shocks" = other structural shocks that drives the innovation in global inflation.

Roles vary over time

- "Oil" important (also captures other commodities)
- Increased role of geopolitical risk and supply chain disruptions

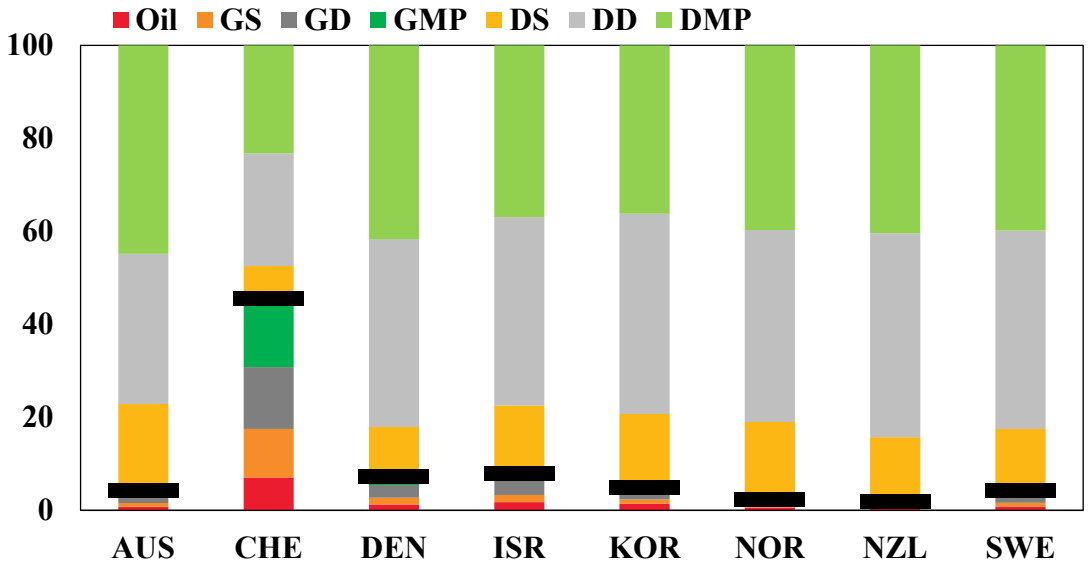
Results for Individual non G-5 AEs

Contribution of Shocks to Interest Rate Variation

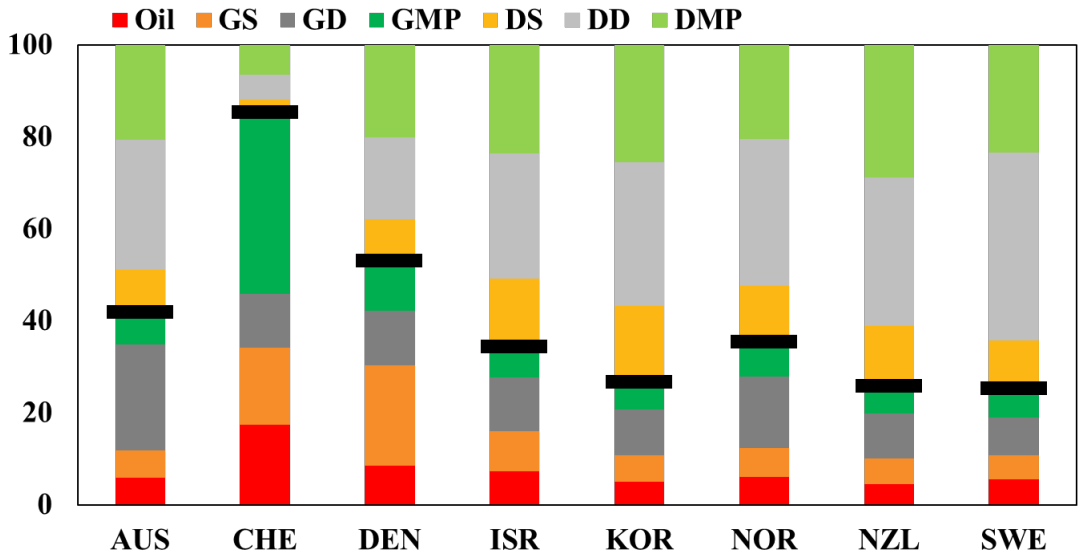
Contribution of Shocks to Variation in Interest Rates

(% of total variation)

Full Sample Period (1970-2024)

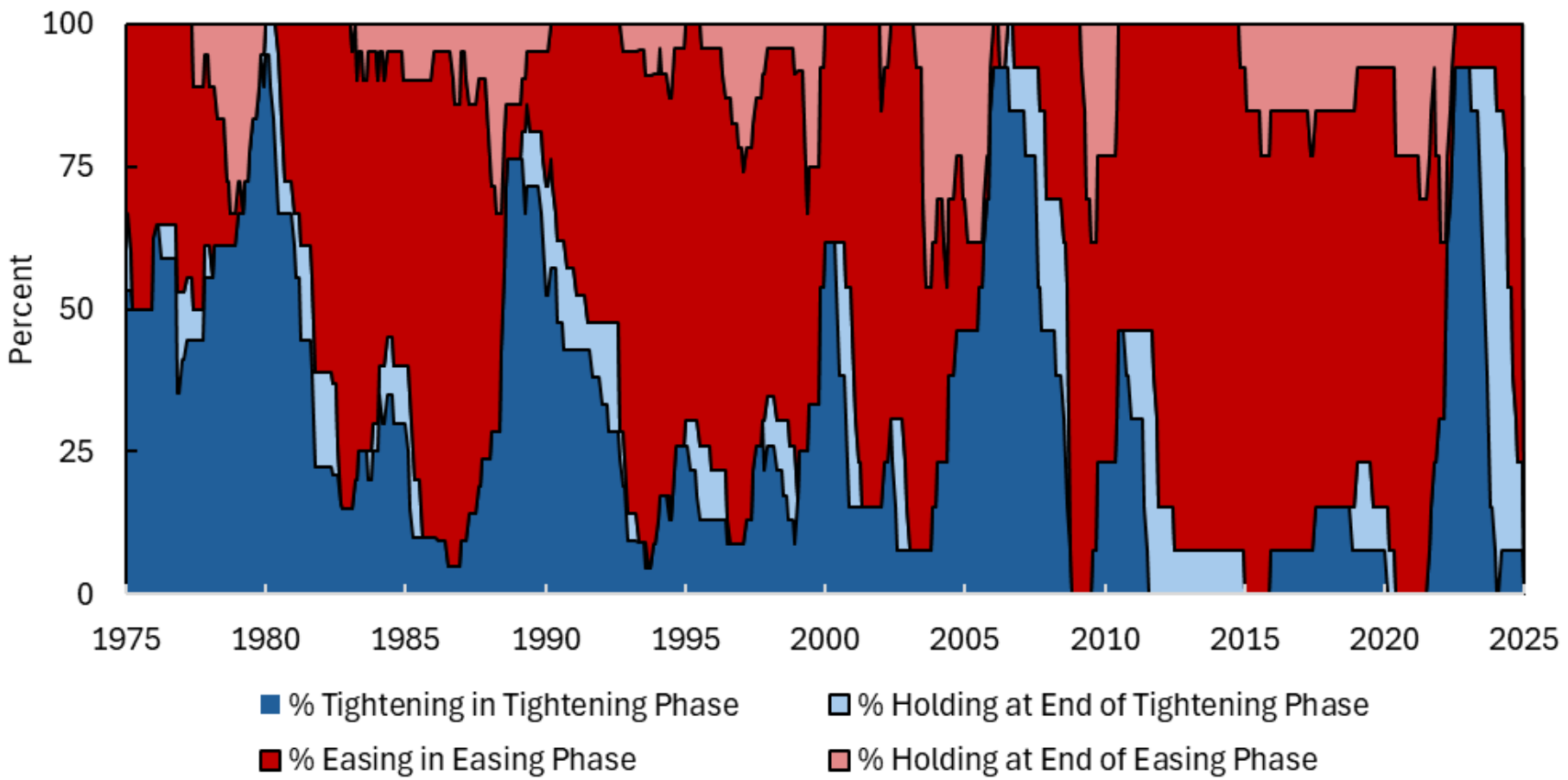


Post-Pandemic Period (2020-24)



Share of Economies in Tightening & Easing Phases

For Monetary Policy



Based on rate cycles defined in Forbes, Ha and Kose (2024) based on data on changes in policy interest rates and QE/QT