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

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Abstract: Business cycles are increasingly driven by global shocks, rather than the domestic demand shocks prominent in earlier decades, posing challenges for central banks seeking to meet domestic mandates and communicate their policy decisions. This paper analyzes the evolving influence and characteristics of global and domestic shocks in advanced economies from 1970-2024 using a new FAVAR model that decomposes movements in interest rates, inflation, and output growth into four global shocks (demand, supply, oil, and monetary policy) and three domestic shocks (demand, supply, and monetary policy). We find that the role of global shocks has increased—roughly tripling from 1970–84 to 2020–24—to now account for about half the variation in interest rates. Compared to domestic shocks, global shocks have a larger supply component, exert greater influence on interest rates (reflecting a higher variance and stronger country-sensitivity), and are more asymmetric (contributing more to tightening than easing phases for monetary policy). As global supply shocks have become more prominent, central banks have also been less willing to "look through" their effects on inflation than for comparable domestic shocks. The distinct characteristics and rising influence of global shocks—particularly global supply shocks—have significant implications for modeling monetary policy and designing central bank frameworks.

Keywords: Demand shocks; supply shocks; geopolitical risk; oil prices; supply-chain disruptions; global uncertainty, central banks, Federal Reserve, European Central Bank

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... if you know Heaven and know Earth, you may make your victory complete ... Sun Tzu (5th century BC)

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)

I. Introduction

In the fifth century BC, the Chinese philosopher and military strategist Sun Tzu wrote about the importance of understanding the impact of "heaven" (events outside a general's control) and "earth" (the local territory) when designing a battle strategy. Over 2500 years later, central banks are struggling with analogous challenges around the role of the global shocks that are beyond their control and how they interact with the domestic economy. During the "Great Moderation" from the mid-1980s through the mid-2000s, business cycles were largely driven by shocks to domestic demand, such that monetary policy benefited from the "divine coincidence" and rarely faced a tradeoff between supporting inflation and activity (Bernanke 2004; Blanchard and Gali 2007). Over the last two decades, however, a series of severe global shocks has driven sharp swings in activity and inflation, often creating difficult tradeoffs for central banks (Tenreyro 2023; Forbes, Ha and Kose 2025) and sparking debates about how monetary policy should best respond (Lagarde 2024; Powell 2023). If geopolitical tensions, trade fragmentation, and climate-related uncertainty persist, the increased role of "heavenly" shocks beyond the control of central banks will continue to have an important impact on the macroeconomy and monetary policy. If the nature of the shocks driving activity and inflation has fundamentally changed, central banks may need to rethink their modelling strategies, policy frameworks and communication strategies.[1]

In order to understand how the shocks behind monetary policy have changed and what this implies for central banks, this paper provides a systematic, cross-country analysis of seven global and domestic drivers of interest rates and other key macroeconomic variables over the last 55 years. The analysis focuses on a new factor-augmented vector autoregressive (FAVAR) model estimated for 13 advanced economies. The results show that the role of global shocks in driving interest rate movements has steadily increased, roughly tripling from 1970–84 to 2020–24, to now account for about half of the variation in interest rates (and substantially more in some economies). The characteristics of these global shocks are also significantly different than those of the previously dominant domestic shocks in several dimensions. Global shocks have a larger supply component, greater variance, and more often correspond to a tightening (instead of easing) in monetary policy. In addition, global demand and supply shocks have recently been associated with larger rate adjustments than comparable domestic shocks, and global supply shocks are less likely to be "looked through" than comparable domestic supply shocks. Understanding the differences between domestic demand shocks—which have traditionally been central to most macroeconomic models—and the increasingly important global shocks is crucial for forecasting, formulating monetary policy, and communicating reaction functions.

[1] These considerations contributed to the ECB's 2025 framework revisions (2025 Monetary Policy Assessment). For additional discussions by central bank board members on how the nature of the shocks affecting monetary policy has evolved, see discussions by Clare Lombardelli (BoE), Phillip Lane (ECB), and Anna Seim (Riksbank) in the "Review of Monetary Policy Strategy by Central Banks" at the PIIE on April 24, 2025.

Our analysis builds on several areas of research. It links to a large literature highlighting the growing role of global variables for the domestic economy and financial markets (Miranda-Agrippino and Rey 2020; Forbes 2019; Ha, Kose, and Ohnsorge 2019; Obstfeld and Taylor 2004). It also draws on the extensive literature identifying and decomposing the sources of different types of cycles—including business and inflation cycles (Harding and Pagan 2002; Ciccarelli and Mojon 2010; Ha et al. 2024). This literature often decomposes the shocks behind business cycles into demand and supply components, sometimes further differentiating monetary policy and oil shocks (Madeira, Madeira, and Monteiro 2023; Giannone and Primiceri 2024). Most of this work, however, does not differentiate between the global and domestic sources of these shocks. This paper also links to the related and extensive DSGE literature, which models the macroeconomic impact of various shocks and is used for forecasting and setting monetary policy. Open-economy DSGE models include a wider set of relationships between domestic economies and the rest of the world than the earlier closed-economy versions,[2] but still usually assume the effects of global (and most domestic) shocks are linear and symmetric, despite evidence that price adjustments can be asymmetric (Ball and Mankiw 1994) and extensive recent evidence that the transmission of large shocks is non-linear (Cavallo et al. 2023; Dedola et al. 2024; Schnabel 2025).[3]

To the best of our knowledge, this paper is the first systematic analysis of the specific global and domestic drivers of interest rate fluctuations across countries and over time—a more granular decomposition enabled by the long time series in our panel dataset.[4] This analysis also contributes to the very recent literature on the post-pandemic inflation surge, which debates the relative importance of demand and supply shocks (and their interaction), but pays little attention to whether the shocks were primarily global or domestic.[5] While disentangling these effects in real time is difficult (Mankiw 2024), several papers have discussed how an insufficient understanding of the role of demand versus supply shocks during this period may have contributed to the delay in tightening monetary policy and subsequent inflation surge (see Giannone and Primiceri 2024; Forbes et al. 2024). An insufficient understanding of the extent to which these shocks were global versus domestic could also have contributed to the widespread inflation forecast errors during this period, particularly if global shocks have more nonlinear or asymmetric effects than domestic shocks (as shown below).

The remainder of this paper is divided into six sections. Section II develops our FAVAR model that forms the core of the paper. The model includes four distinct global shocks (for demand, supply, oil, and monetary policy) and three domestic shocks (for demand, supply, and monetary policy) to explain fluctuations in interest rates, inflation and output. This section also discusses the data sources used to construct the monthly time series from 1970-2024 for our sample of 13 advanced economies that is the

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[2] Open-economy DSGE models include global shocks such as to foreign demand, terms-of-trade, exchange rates, and global interest rates. Adolfson et al. (2007), Monacelli (2005), and Justiniano and Preston (2010) analyze how global shocks shape domestic inflation, output, and interest rate dynamics through trade and financial linkages. Corsetti, Dedola, and Leduc (2010) and Garcia-Cicco et al. (2010) further emphasize the importance of global supply and risk premium shocks in explaining macroeconomic volatility in open economies. Policy institutions have embedded similar global shocks in their models—such as in the IMF's GIMF (Kumhof et al. 2010), the ECB's BASE model (Angelini et al. 2019), and the Bank of Canada's ToTEM III (Corrigan et al. 2021).

[3] Two noteworthy exceptions of recent New Keynesian models that allow for nonlinearities and asymmetries consistent with the results in this paper are Karadi et al. (2024) and Ascari et al. (2025).

[4] The only exception is the related paper, Forbes, Ha and Kose (2024), which develops and analyzes the interest rate cycles used in part of the analysis below.

[5] Key papers in this debate include: Ball, Leigh and Mishra (2022, 2025), Bernanke and Blanchard (2024), Coibion and Gorodnichenko (2025), Di Giovanni et al. (2023), Gagliardone and Gertler (2023), Giannone and Primiceri (2024), Ha et al. (2024), Ha, Kose, and Ohnsorge (2019), and Shapiro (2022).

focus of the subsequent analysis. The section closes by estimating key inputs to the FAVAR model (the global factors for interest rates, inflation and output growth) using a dynamic factor model.

Section III assesses the evolving role of global versus domestic shocks for domestic monetary policy. We use the FAVAR model to decompose the share of the variation in interest rates into global and domestic shocks over different periods since 1970. The role of the global shocks has roughly tripled between 1970-84 and 2020-24, playing a noticeably larger role after 1999 and then again after 2020. In fact, the total contribution of global shocks to the variance of interest rates reached almost 50% over the last five years, such that the contribution of the global shocks is roughly equal to that of domestic shocks on average for the first time in the sample (and even larger for several major advanced economies, particularly the euro area).

This increased role of "heaven", i.e., global shocks outside the control of any individual central bank, could have limited implications for domestic monetary policy if these shocks have similar characteristics and effects on macroeconomic variables as domestic shocks. For example, if both domestic and global supply shocks are similar other than whether they originate from home or abroad, they would likely merit the same monetary policy response (ignoring any cross-border spillover effects). On the other hand, if global shocks tend to be different than the corresponding domestic shocks—such as by originating more from supply shocks, being larger, being more persistent, having asymmetric effects, or having a greater impact on inflation—they may require different policy responses, frameworks, and communication strategies. In this case, accurately identifying whether a shock originates from global or domestic sources, as well as whether it reflects a shock to demand or supply (or other sources), would be critical to modelling the effect and formulating the appropriate policy response.

Therefore, Section IV explores whether global and domestic shocks differ in their characteristics and effects on domestic economies, focusing on five key dimensions. First, we compare the sources of global and domestic shocks, such as the relative contributions of supply, demand, and monetary policy shocks. Second, we assess differences in the size and volatility of the shocks. Third, we evaluate how sensitive countries are to each type of shock, controlling for the source and size. Fourth, we examine whether there are directional asymmetries, i.e., whether global and domestic shocks differ in their implications for monetary tightening versus easing. Finally, we compare the role of these global shocks for inflation and output versus interest rates to assess if there have been changes in the extent to which monetary policy "looks through" different types of shocks.

The results suggest that global and domestic shocks have meaningfully different characteristics and effects on monetary policy across each of the five dimensions analyzed. First, there are notable differences in the sources of each type of shock when explaining the variation in interest rates. Global shocks have a larger supply component than domestic shocks (38% versus 14%) across the full period, while domestic shocks have a larger monetary policy component than global shocks (42% versus 24%). The role of supply has also increased more for global shocks, such that global supply (including oil price) shocks became more important than global demand shocks in 2020-24. This is a sharp contrast to the decompositions for domestic shocks, for which demand shocks are two to three times more important than supply shocks in each period (including 2020-24).

The rising contribution of global shocks over time—particularly global supply shocks—to the variation in interest rates reflects two additional dimensions in which global and domestic shocks differ: their volatility and country sensitivity to each type of shock (after controlling for its source and size). The volatility of global shocks has increased over time (with the volatility of global demand, global supply, and global monetary policy shocks all reaching sample highs over 2020-24), while the volatility of domestic shocks has decreased over time. Similarly, country sensitivity to the main sources of global shocks (supply and demand) has increased, while country sensitivity to the dominant sources of domestic shocks (demand and monetary policy) has decreased. While the sharp increase in the volatility of and country sensitivity to global supply shocks over 2020-24 may reflect the unique events of this period, the increased influence of global demand shocks and decreased role of all domestic shocks appear to be a continuation of longer term trends from before the pandemic.

The fourth dimension by which global and domestic shocks differ is an asymmetry in the direction of their effects on monetary policy. While global shocks have played a larger role over time in driving interest rate movements in both directions, they play a more prominent role in explaining increases than decreases in interest rates (even after controlling for the structural source of the shocks). Global supply shocks explain about one-third of the increase in interest rates over each decade since the 1990s, while domestic supply shocks play virtually no role. Global monetary policy shocks make little contribution to reductions in interest rates (but often play a significant role in rate hikes), whereas domestic monetary policy shocks contribute meaningfully to reductions in interest rates (and make little contribution to rate hikes since the 1970s).

A final set of results highlights how the role of global and domestic shocks has evolved differently for interest rates versus inflation and output growth, with implications for central banks' willingness to "look through" these different types of shocks. Over the full period, supply shocks (both global and domestic) explain a larger share of the variation in inflation and output growth than interest rates, consistent with models that monetary policy should, under certain conditions, "look through" at least some of the effects of supply shocks on inflation and growth (Bandera et al. 2023; Tenreyro 2023). Since 1998 (and particularly over 2020-24), however, global supply shocks have played an even larger role in explaining the variation in interest rates than for inflation and output—the opposite of the pattern over the full period and for just domestic supply shocks. In other words, monetary policy responds more strongly (and is less likely to look through) global supply shocks than domestic supply shocks. This is consistent with estimates that the importance of global shocks has increased even more for interest rates than for the other macroeconomic variables over time, suggesting a greater "globalization" of interest rates than of other key variables that affect monetary policy.

Most of the analysis reported above relies on the baseline FAVAR model developed in Section II. Section V summarizes a wide range of extensions and robustness exercises. The section begins with a decomposition of the role of different shocks for individual economies (focusing on the G-5). Then we summarize a series of sensitivity tests, including: alternative definitions for key global and domestic variables, excluding the largest economies, excluding periods of heightened macroeconomic volatility, and alternative modelling specifications (including time-varying coefficients) and identification schemes. Our headline results showing an increased role of global shocks in explaining the variation in interest rates over time, as well as documenting the five dimensions by which global shocks differ from domestic shocks, are all robust to these exercises. Section VI concludes with a discussion of the implications of a greater role for shocks from "heaven" for monetary policy models, frameworks, and communication.

II. Methodology: FAVAR Model, Database and the Global Factors

In order to understand the evolving global and domestic sources of fluctuations in interest rates, inflation and output growth, this section develops a new factor-augmented VAR (FAVAR) that is used for the estimates and analysis throughout this paper. This model builds on a large literature using VAR models to decompose the shocks behind interest rates and other macroeconomic variables (Uhlig 2005; Charnavoki and Dolado 2014; Madeira, Madeira, and Monteiro 2023), but our framework has the important advantage of providing a richer decomposition of the underlying shocks. It not only differentiates between global and domestic sources for each type of shock (i.e., supply, demand, and monetary policy), but also allows for a more detailed decomposition of supply shocks (into global and domestic sources, as well as separating out the role of oil prices). This section begins by introducing the FAVAR model and framework and then provides information on the sample and dataset used to estimate the model. The section closes by estimating the global factors used as inputs for the FAVAR model in the remainder of the paper.

II.1 The FAVAR Model

The FAVAR model central to our analysis includes four global variables (global interest rates, global inflation, global output growth, and global oil price growth) and three domestic variables (domestic interest rates, domestic inflation, and domestic output growth). More specifically, to estimate the contributions of different global and domestic shocks, we employ the following model:

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

$$\varepsilon_t \sim N(0, \textstyle\sum_t),$$

where Z_t consists of global interest rates ($f_t^{R,global}$), global inflation ($f_t^{\pi,global}$), global output growth ($f_t^{y,global}$), oil price growth (Δop), domestic interest rates ($R^{domestic}$), domestic inflation ($\pi^{domestic}$), and domestic output growth ($y^{domestic}$).

The ε_t is a vector of orthogonal structural innovations and includes seven shocks. There are four global shocks: (i) common changes in monetary policy across countries ("global monetary policy"); (ii) the global demand for goods and services ("global demand shock"); (iii) the global supply of goods and services ("global supply shock"); and (iv) oil prices ("oil price shock"). There are also three domestic shocks: (v) domestic monetary policy ("domestic monetary policy shock"); (vi) the domestic supply of goods and services ("domestic supply shock"); and (vii) the domestic demand for goods and services ("domestic demand shock").[6]

The model assumes stochastic volatility of the structural shocks—the residuals represented by the time-varying residual covariance matrix $\sum_t$. These shocks are independently (but not identically) distributed across time. Although many VAR models assume that the variance-covariance matrix of residuals is constant over time, this assumption could be problematic in our exercise since there are several periods with substantially heightened volatility in our long time series, such as around the oil crises in the 1970s and the COVID-19 pandemic (Lenza and Primiceri 2022). Therefore, we allow the variance-covariance

[6] Our global and domestic shocks are motivated by theoretical studies on the sources of movements in interest rates, output, and inflation in the United States. For instance, Smets and Wouters (2007) decomposes the variation in these variables into demand shocks (including risk premium and fiscal), price mark-up shocks (including commodity prices), supply shocks, and interest rate shocks.

matrix of residuals $\sum_t$ to be period-specific, hence rendering stochastic volatility and introducing heteroskedasticity (Carriero, Corsello, and Marcellino 2019).[7]

We estimate this FAVAR model using monthly data with four lags (based on the AIC and SIC information criteria).[8] The Bayesian routine we employ first searches for 1,000 successful draws from at least 2,000 iterations with 1,000 burn-ins; the results are based on the median of these 1,000 successful draws. The estimation process is standard Gibbs sampling, except that the volatility of residuals is endogenously determined. Structural shocks are assumed to have unit variance.

We identify the seven shocks using sign and zero restrictions, following previous research on the drivers of inflation and monetary policy. Postulating that B_0^{-1} in our model has a recursive structure such that the reduced form errors can be decomposed according to $u_t = B_0^{-1}\varepsilon_t$, the sign and zero restrictions imposed over the first month are:

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

The * stands for an unrestricted initial response. These restrictions assume that domestic shocks (labelled with a "D") do not affect global variables contemporaneously (i.e., in the same month).[9] Global shocks (labelled with a "G"), however, can affect domestic variables (without any sign or zero restrictions).

The sign restrictions identifying the shocks are consistent with previous work. A positive global monetary policy shock increases global interest rates while decreasing global (output) growth and inflation.[10] A contractionary (positive) domestic monetary policy shock lowers domestic growth and inflation, with an indeterminate effect on oil prices (see Uhlig 2005; Madeira, Madeira, and Monteiro 2023; Gerlach and Smets 1995).

A positive global demand shock increases global growth, global inflation, the global interest rate, and oil prices. A positive global supply shock raises global growth and oil prices but reduces global inflation and

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[7] Specifically, ε_t is serially independent with zero mean and variance $\sum_t$. We assume that $\sum_t = F\Lambda_t F'$, where F is a lower triangular matrix with ones on its main diagonal, while Λ_t is a period-specific diagonal matrix whose diagonal elements $\Lambda_{jj,t}$ (the time-varying variances) follow a stochastic process (Cogley and Sargent 2005).

[8] We use first-differenced data, such that the SIC (AIC) statistics support lag lengths of 2-4 months, depending on the countries and periods included in the sample. Extending the lag length to 8-12 months does not lead to any meaningful impact on the main results but loses some observations in the sample.

[9] We only impose these zero restrictions on spillovers for the contemporaneous month, thereby allowing spillovers from the economies in our sample to the global variables after a month and not making the small-open economy assumption that is typical in much of this literature (i.e., assuming zero spillovers from each economy to the global variables over a longer period of time). Also, since spillovers from the largest economies in our sample (such as the United States and euro area) to other economies could occur within a month in some circumstances, Section V.3 reports sensitivity tests excluding the major advanced economies. There is no impact on the key results.

[10] Global monetary policy shocks are simultaneous monthly changes in domestic interest rates across central banks.

has an indeterminate effect on global interest rates (Charnavoki and Dolado 2014; Ha et al. 2024). A positive domestic supply shock raises domestic growth, but reduces domestic inflation, with an indeterminate effect on domestic interest rates. A positive domestic demand shock raises domestic growth, inflation, and interest rates. The identification assumptions related to oil price shocks also closely follow earlier studies (Melolinna 2015; Charnavoki and Dolado 2014), which assume that a positive cost (commodity price) shock reduces growth and raises commodity prices and inflation.[11]

II.2 Database

The FAVAR model is estimated using monthly data for interest rates, output growth, and inflation from January 1970 through September 2024. In our baseline analysis, we focus on 13 advanced economies (Australia, Canada, Denmark, euro area, Israel, Japan, Korea, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States), treating the euro area as one entity.[12] **Appendix Table A1** provides more information on the underlying data and sample.

We focus on these economies primarily because of their size and the availability of data on interest rates, output, and inflation for most of the sample period. Specifically, we select these economies based on the following criteria: (i) they are defined as advanced economies in the World Bank's Global Economic Prospects report, January 2024 (World Bank 2024); (ii) they are independent countries with GDP of at least $100bn in 2023; and (iii) they have data for activity (GDP or industrial production), inflation and interest rates from at least 1980.

To measure the domestic variables in the FAVAR model, we primarily rely on data from Haver Analytics, supplemented with information from the OECD and other sources listed below. We measure interest rates using shadow interest rates (from Krippner 2013), and for periods and economies that the shadow rate is not available, we use overnight market rates (e.g., discount rates) or 3-month Treasury bill yields. If none of these are available, we use the policy interest rate (from the BIS). We start with shadow interest rates (or market rates) as these better capture changes in monetary policy when central banks relied more heavily on unconventional tools after 2008 (such as quantitative easing).[13]

For robustness checks (in Section V.2), we use only the nominal policy interest rate set by the central bank, which has less variation (particularly during periods when interest rates were at zero-lower bounds) and yields less precise model estimates. In each case, we measure euro area interest rates as the GDP-weighted average of the relevant interest rate for individual member countries before 1999, and then the rate for the ECB after it began implementing monetary policy for member countries. We measure inflation based on the headline CPI price index, and measure output growth as the growth rate of industrial

[11] For similar approaches to the identification of supply, demand and oil price shocks, see Gambetti, Pappa, and Canova (2008), Melolinna (2015), and Antolín-Díaz and Rubio-Ramírez (2018).

[12] The euro area countries included in the analysis are: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, and Spain. Although changes in interest rates in Denmark often closely mirror those of the euro area, there are periods when they diverge, so we include Denmark as a separate entity. Excluding Denmark from the analysis has no meaningful impact on the key results.

[13] The shadow interest rate is estimated as the shortest maturity rate based on the shadow yield curve using a dynamic factor model with variables closely associated with different types of monetary policy operations (Krippner 2013). The resulting shadow rate is essentially equal to the policy interest rate in "non-lower" bound or unconventional monetary policy environments. The shadow interest rate is available from 1995 for Australia, Canada, the euro area, Japan, New Zealand, Switzerland, the United Kingdom, and the United States.

production (which is more widely available than GDP growth at a monthly frequency, particularly early in the sample). All variables are month-on-month, demeaned, and stationary, with details in Appendix A1.

The three global variables in the FAVAR model—the global interest rate, global inflation, and global output growth—are estimated as factors using a simple dynamic factor model (discussed in Section II.3). The final global variable, oil price growth, is measured as the month-on-month growth rate for nominal oil prices (calculated as the simple average of Dubai, West Texas Intermediate, and Brent benchmarks) from the World Bank's monthly Pink Sheet of commodity prices.

The resulting dataset covers January 1970 through September 2024, and much of our analysis evaluates how relationships have changed meaningfully over this long period. To be consistent, we focus on five sub-periods throughout the paper. Each of these sub-periods includes some type of recession/crisis and recovery period, with the divisions between sub-periods often marking a major global event that might have changed the nature of macroeconomic cycles. The five sub-periods are:

- ***1970-84***: the global recessions of 1975 and 1982, and the first and second oil crises in the 1970s
- ***1985-98:*** the 1991 global recession, the global downturn in 1997-98 associated with the Asian and Russian financial crises, and a series of debt defaults and emerging market crises
- ***1999-2007***: the bursting of the tech bubble, the 2001 global downturn, and the lead up to the 2008 Global Financial Crisis
- ***2008-19:*** the Global Financial Crisis and the 2009 global recession, the 2012 global downturn associated with the euro area debt crisis, and the 2014-16 collapse in oil prices
- ***2020-24:*** the outbreak of the COVID-19 pandemic and corresponding 2020 global recession, the 2022 Russian invasion of Ukraine and corresponding commodity price shock and post-pandemic inflation surge

The first two sub-periods (from 1970-98) are before the creation of the euro area, while the later three periods (from 1999-2024) are when the ECB set monetary policy for its member countries. The sub-periods before 1999 were also when central banks used a wider range of monetary policy tools, frameworks, and strategies—with some central banks putting more weight on monetary targets and exchange rates (and interest rates determined partly by markets as well as central bank operations). Over the 1990s and 2000s, however, most central banks in our sample transitioned to some form of inflation targeting, albeit these more comparable frameworks also involved their own evolution of tools and frameworks (such as the greater use of balance sheet policies and forward guidance).[14]

II.3 The Global Factors

In order to identify the global factors for interest rates, inflation, and output needed to estimate the FAVAR model, we use a dynamic factor model. This section summarizes this model, the resulting estimates, and how to interpret these "heavenly" factors. More details and the full results are in Appendix B.

We use a simple dynamic factor framework to estimate the following model of the global factors for interest rates, inflation, and output growth (as employed in Ha et al. 2024):

[14] For some parts of our analysis, we also split the sample into decades, or into two longer sub-periods (1970-98 and 1999-2024) to account for when the ECB began setting policy rates for its members.

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

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

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

where R_t^i, π_t^i, and Y_t^i refer to interest rates, inflation, and output growth in country *i* in month *t*, respectively. The $f_t^{R,global}$, $f_t^{\pi,global}$ and $f_t^{Y,global}$ are the global factors for interest rates, inflation, and output growth in month *t*, respectively. The factors and error terms follow independent autoregressive processes, as is standard in this literature. The error terms are assumed to be uncorrelated across countries at all leads and lags. We estimate the model using standard Bayesian techniques, as described in Kose, Otrok, and Whiteman (2003, 2008).

Next, we use the data discussed in Section II.2 to estimate the contributions of each of the three global factors to the variances of each of the corresponding variables. The resulting estimates of the contribution of the global factor to the variance of national interest rates, inflation and output are discussed in detail in Appendix B, with results for the longer periods specified above in **Appendix Table B1** and Appendix **Figure B1**, and then for shorter windows in **Appendix Figures B2 and B3**.

Several results are worth highlighting. First, the global interest rate factor played a modest role in driving fluctuations in national interest rates over the full sample period; it accounted for 13 percent of the interest rate variation, on average, over 1970-2024. Second, the importance of the global interest rate factor has risen sharply, more than tripling since the 1990s.[15] Specifically, the size of the global factor jumped from explaining about 10% of the interest rate variation over 1970-84 and 1985-98, to about 30% over 1999-2007 and 2008-19, and then 38% over 2020-24. Interest rate cycles have become much more synchronized over the past quarter century.

Third, this increased global synchronization in interest rates coincides with stronger comovement in inflation and output growth, but the comovement in interest rates has increased by even more and to higher levels than for the other two variables. More specifically, the share of the global factor for inflation and output growth roughly doubled from 1970-84 through 2008-19 (versus tripling for interest rates). As a result, the global factor explained a larger share of the variation in interest rates in the period before the pandemic (at 29%), as compared to only 24% for domestic inflation and 13% for output growth.[16] After estimating the full FAVAR model below, Section IV.5 will utilize this richer set of results to return to this issue of why interest rates have become more "globalized" than inflation and growth. The global factor for each variable also increased sharply over 2020-24, with a particularly large jump for output growth reflecting the synchronized collapse and then rebound in output around the pandemic lockdowns.

Finally, it is important to highlight what these estimates of the global (aka "heavenly") factors capture: the comovement in the relevant variables across the economies in our sample. Changes in these global factors could therefore result from a wide range of developments. For example, an increase in the global

[15] We calculate the variance contribution of the global rate factor using other sub-sample periods (which are not based on when the ECB began setting interest rates) or excluding some large economies (such as the United States or the euro area). The key patterns of an increased role for the global rate factor over time are unchanged, as discussed in Section V.3 and shown in **Table 2**.

[16] These estimates of the role of the global factor for interest rates, inflation, and output growth are similar if we focus on medians (instead of averages) in our sample. Also, within each country, the global factor for interest rates has increased significantly over time.

interest rate factor could reflect: (1) a large, exogenous shock that affects all countries simultaneously (such as a global supply shocks from a pandemic or blockage of a major shipping route); (2) a shock emanating from one economy that affects the other countries in the sample at the same time (such as a monetary policy surprise in the United States or the 2008 Global Financial Crisis); (3) a highly synchronized policy response across the economies in the sample (such as a coordinated fiscal response or more widely shared framework for monetary policy); or (4) stronger linkages between countries over time, such as through trade or financial flows, such that exogenous shocks or shocks to one economy have larger effects across the sample. These developments contributing to the global factor have different interpretations and could generate different policy conclusions. The estimates of the global factor in this section do not differentiate between these explanations, but the more detailed decompositions in the remainder of the paper help differentiate (to some extent) between these explanations. The terms "global shocks" or "shocks from heaven" used throughout this paper are intended to capture this broad set of channels that are largely outside the control of individual central banks, and in many cases also outside the control of individual domestic policymakers.

III. The Role of Global versus Domestic Shocks over Time

How important are global shocks (versus domestic shocks) in explaining the variation in interest rates? And has the role of global shocks evolved over time? This section uses the FAVAR model developed in Section II to estimate variance decompositions quantifying the importance of global and domestic shocks to national interest rates over the full period from 1970-2024 and then over the five shorter windows. The analysis focuses on simple averages across the economies in the sample in order to focus on the broader cross-country experience (with more details on the cross-country variation in Section V.1).

A number of papers study the cross-country comovement of interest rates (Crucini, Kose and Otrok 2011; Lindenberg and Westermann 2012; Henriksen, Kydland, and Sustek 2013) and find an increase in this comovement over time. Forbes, Ha and Kose (2024) further documents "waves" in the synchronization in policy interest rates across advanced economies from 1970-2024. These waves show that during certain periods a large share of economies abruptly and simultaneously adjust monetary policy in the same direction, underscoring the role for global shocks, while during other periods there is substantial divergence in interest rate adjustments, suggesting a larger role for domestic shocks.

To begin our assessment of the evolving role of global and domestic shocks, **Figure 1** (Panel A) shows the decomposition of the variance of national policy interest rates using the FAVAR model from Section II into the contribution of all four global shocks (in dark blue) and all three domestic shocks (in grey).[17] The top line of **Table 1** (Panel A) reports the underlying estimates. The left bar in **Figure 1** shows that over the full sample period from 1970-2024, global shocks account for only 16 percent of the variation in interest rates on average in the 13 economies (ranging from 2 percent in New Zealand and Norway to 62 percent in the euro area). In contrast, domestic shocks explain the lion's share of the variance of domestic interest rates over the full period, accounting for more than four-fifths of rate fluctuations on average.

[17] The confidence intervals of the estimated variance shares are large, as is typically found using similar VAR methodologies, as well as reflecting the large number of variables included in our FAVAR model. Many of the differences over time highlighted above, however, are still statistically significant. For instance, the contribution of global shocks to interest rates is significantly greater at the 90 percent level in most countries for the subperiods before versus after 1998.

These averages over 55 years, however, mask important changes in the role of global and domestic shocks over time. To assess how their relative importance has evolved, we calculate the same variance contributions for national policy interest rates over the five sub-periods from Section III.2. The right sides of **Figure 1** (Panel A) and **Table 1** show the results. The contribution of global shocks to the variance of interest rates roughly doubled from the earlier half of the sample (1970-98) to the latter half (1999-2024), and roughly tripled from 17% in the earliest subperiod (1970-84) to almost 50% in the latest subperiod (2020-24). In other words, the contribution of global shocks over the last five years is roughly equal to that of domestic shocks for the first time in the sample (on average). In fact, and as shown in the country-specific results in Section V.1, the global shocks are larger than the domestic shocks over 2020-24 for the largest advanced economies in our sample (Canada, the euro area, Japan, the United Kingdom and United States).[18]

It is also worth comparing these results from the FAVAR model estimating the role of global shocks in explaining the variation in domestic interest rates (**Figure 1**, Panel A) with the results of the dynamic factor model in Section II.3 estimating the global factor in interest rates (Panel B). Over the full period from 1970-2024, the FAVAR models estimates that 16% of the variation in interest rates is explained by global shocks (on average), which is very similar to estimates from the dynamic factor model that 15% of the comovement in interest rates is explained by the global interest rate factor. Also, in each case the importance of the global component increases significantly over time, jumping after 1999, and then again over 2020-24. Both sets of results are consistent with national interest rates becoming increasingly more synchronized across economies over time.

IV. Characteristics of the Global versus Domestic Shocks Driving Interest Rates

The role of "heaven"—of global shocks and the global factor—in explaining the variation in interest rates has increased markedly over the last 55 years. If these global shocks are different than domestic shocks, they could have different effects on domestic economies and merit different policy responses. Therefore, this section explores if global and domestic shocks vary in their characteristics and effects across five dimensions. First, it assesses differences in the underlying sources of the shocks (e.g., whether they are driven more by supply or demand). Second, it evaluates differences in the size and volatility of global versus domestic shocks (controlling for the source of the shock). Third, it analyzes the sensitivity of interest rates to each type of shock (controlling for the shock source and size). Fourth, it considers whether global and domestic shocks have asymmetric effects, i.e., are more important for periods of monetary policy tightening versus easing. Finally, it compares the role of these global shocks in explaining the variation in inflation and output growth to that for interest rates in order to better understand when different types of shocks are more likely to be "looked through".

IV.1. Sources of Global and Domestic Shocks

To assess if there are differences between global and domestic shocks and how they have evolved over time, we repeat the analysis in Section III using the FAVAR model to explain the variance of national policy interest rates, except now report more detailed decompositions into seven shocks: global demand, global supply, global monetary policy, oil prices, domestic demand, domestic supply, and domestic monetary policy. The first four constitute global shocks (i.e., shocks from heaven), and the last three domestic

[18] The role of global shocks is smaller in many of the smaller advanced economies, with the prominent exception of Switzerland, as shown in Appendix C.

shocks. We continue to focus on the averages across our sample of 13 advanced economies, with more information on results for individual economies in Section V.1 and Appendix C.[19]

Figure 2 (Panel A) shows the resulting decompositions over the full sample period from 1970-2024 and five shorter sub-periods, with the underlying estimates in **Table 1** (Panel A). The figure shows the total contribution of each type of shock to the total variation in interest rates, with the black line denoting the split between global and domestic shocks and a darker shade of each color for the global component (i.e., dark grey representing global demand shocks and light grey for domestic demand shocks).

Before analyzing the differences between the global and domestic shocks, it is worth examining the patterns for the different sources of shocks. Demand shocks (both global and domestic) accounted for the largest share of the variation in interest rates over the full period (43%), followed by monetary policy shocks (39%) and a more modest role for supply shocks (18%). The contributions of these different sources of shocks, however, evolved meaningfully over time. The combined role of supply shocks (both global and domestic and including oil prices) increased from 18% over 1970-84 to 28% over 2020-24, largely balanced by a decreased role of monetary policy shocks (whose contribution fell from 38% to 31% over this same period) and only a modest fall of 3pp in the role of demand shocks.

Shifting to the results for the different sources of global and domestic shocks in explaining the variation in interest rates, the role of each of the individual global shocks has roughly tripled over time. It is noteworthy that the contribution of global supply (including oil) shocks reached a high of almost 20% in 2020-24[20]—much higher than the 7% during the well-known oil price shocks over 1970-84.[21] In contrast, but also consistent with the decreasing role of domestic shocks in aggregate, the contribution of each of the domestic shocks has also fallen over time, with a particularly large decline in the contribution of domestic monetary policy shocks.

But has the relative importance of these different shock sources varied across global versus domestic shocks over time? To simplify this comparison, **Figure 2** (Panel B) decomposes just the global shocks and then just the domestic shocks for each subperiod into the contributions of supply, demand and monetary policy shocks (with oil price shocks broken out but included as global supply shocks in this discussion). This decomposition shows that global shocks are driven primarily by supply and demand shocks over the full period (accounting for 38% and 37% of the global shocks, respectively), and these relative contributions are fairly steady across each of the subperiods. The main exception is over 2018–19, when the role of global demand shocks increased around the Global Financial Crisis.

In contrast to these sources of global shocks, supply shocks play a relatively smaller role and monetary policy shocks a relatively larger one for the domestic shocks. More specifically, the sources of the domestic shocks over the full period are primarily demand and monetary policy (accounting for 44% and 42% of the

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[19] The analyses in Sections IV and V continue to include the euro area as one entity. Empirical results do not change materially if we focus on a larger group of 24 economies that treats each member of the euro area as a separate entity.

[20] The larger share of global supply and oil price shocks over 2020-24 also reflects the effects from other commodity prices, such as gas and food prices, particularly after the Russian invasion of Ukraine in 2022. Depending on their contemporaneous correlation with oil prices, these non-oil commodity price shocks will be counted as either oil price shocks or global supply shocks in the FAVAR framework.

[21] Despite large oil price movements in the 1970s and 1980s, the contribution of oil price shocks to interest rates is rather muted compared to that for inflation and output (as documented in Section IV.5). This may partly reflect less responsiveness by central banks to supply shocks during this earlier period, or different monetary policy tools and frameworks (such as less focus on inflation targeting).

domestic shocks, respectively), while domestic supply shocks only contribute 14%. These patterns are also fairly consistent across periods, albeit with a small increase in the role of domestic supply shocks (to 18%) over 2020-24.

Overall, this analysis highlights important, and fairly persistent, differences in the source of global and domestic shocks. Supply shocks are more important sources of global shocks than domestic shocks (38% versus 14%, respectively), while monetary policy shocks are more important sources of domestic shocks than global shocks (42% versus 24%, respectively). Demand shocks are an important source of both global and domestic shocks, but play a somewhat smaller role for global shocks (37% versus 44%). It is not surprising that the increased role of global shocks overall (i.e., when not disaggregated by the source of the shock) as documented in Section III corresponds to an increased role of supply shocks (which constitute a relatively larger share of global than domestic shocks).

IV.2. Volatility of Global and Domestic Shocks

Global and domestic shocks could vary not only due to their underlying sources, but also in their underlying volatility and/or how this volatility has changed over time. To evaluate these metrics, we use the detailed variance decompositions from Section IV.1, but now report the volatility of the different shocks over each subperiod. We focus on decompositions controlling for the source of the shock (e.g. supply, demand and monetary policy) as well as if the shock was global or domestic, to evaluate if changes in the volatility of different groups of shocks reflect changes in where the shock originates (i.e., global versus domestic) or the composition of each type of shock. For example, an increase in the volatility of global shocks over 2020-24 could reflect an increase in the volatility of global supply shocks during this period, or an increased share of global shocks explained by supply shocks if supply shocks are more volatile than other types of shocks.

Figure 3 (Panel A) shows the volatility of supply, demand, and monetary policy shocks, broken into their domestic and global components, over the five periods used throughout this paper. Each comparison shows a striking pattern: the volatility of each type of domestic shock has declined over time, whereas that of each type of global shock increased sharply to peak during 2020-24. This could explain the patterns documented in Section III: an increased role for global shocks and decreased role for domestic shocks in explaining the variation in interest rates over time and especially over 2020-24. Differences in the variance of global and domestic shocks when controlling for the source of the shock tend to be smaller before 2020-24, with global demand shocks slightly more volatile than domestic demand shocks over 1999-2019, and global supply shocks (including oil prices) exhibiting similar volatility as domestic supply shocks before 2020.

The jump in the volatility of the global shocks around the pandemic reflects different sources of global shocks as well as changes in the volatility of specific types of shocks. While the volatility of each type of global shock increased sharply in the last five years of the sample, the longer term trends vary. More specifically, for global demand, this increase in volatility over 2020-24 is a continuation of longer-term trend of increased volatility since the mid-1980s (albeit with a notably larger jump over 2020-24). In contrast, for the other types of global shocks, the increase in volatility over 2020-24 is unique to this period, possibly reflecting adjustments around the pandemic that may not persist. Also, for each group of variables, the global shocks played a larger role in the 1970-84 window than in subsequent periods until 2020.

IV.3. Sensitivity of Interest Rates to Global and Domestic Shocks

The role of different shocks in driving the variation in interest rates reflects not only the magnitude and volatility of the shocks, but also the sensitivity of interest rates to these shocks. For example, movements in oil prices were larger in the mid-1970's and early 1980's than in recent decades, but if economies have become more sensitive to oil price movements, then the variation in interest rates explained by oil price shocks could still have increased over time. Therefore, to understand the evolving role of global shocks, we next evaluate if domestic interest rates have become more or less sensitive to a given change in each of the seven shocks decomposed above.

Theory provides no clear prediction on how the sensitivity of interest rates to global shocks may have evolved over time. As economies have become more closely linked through trade and capital flows, the impact of a global shock on one country could be magnified due to simultaneous effects on neighbors and trading partners. On the other hand, as central banks have become more independent and shifted to inflation-targeting regimes, both of which contributed to a stronger anchoring of inflation expectations, this could give central banks more flexibility to look through global supply shocks (especially if they are believed to be temporary), thereby reducing the impact of global shocks on interest rates.

To test if the sensitivity of interest rates to global shocks has changed over time and if these sensitivities differ relative to those for similar domestic shocks, **Figure 3** (Panel B) shows the impulse responses from the FAVAR model of one standard deviation movements in each of our seven global and domestic shocks.[22] The impulse responses are estimated separately for each of the five periods and show several striking patterns. Over the most recent period from 2020-24, the sensitivity of interest rates to global demand, global supply, and oil price shocks rose; in fact, economies were more sensitive to these individual global shocks than during almost any historical period in our sample.[23] In contrast, interest rates have become less sensitive to domestic demand and domestic monetary policy shocks over time, and show almost no sensitivity to domestic supply shocks since 1999, consistent with monetary policy looking through domestic supply shocks (as discussed in more detail in Section IV.5).

These patterns also reflect notable changes in how interest rates respond to oil prices and domestic supply shocks. During the first three periods (1970–84, 1985–98, and 1999–2007), interest rates were generally lowered in response to oil and domestic supply shocks. After 2008, however, the direction of the response reversed (on average across countries), with central banks generally increasing interest rates in response to oil price shocks (and showing little response to domestic supply shocks). This shift is consistent with central banks placing more weight on mitigating the adverse impact of oil and other supply shocks on output in the earlier periods and then shifting to place more weight on stabilizing inflation in later periods, a shift that aligns with the widespread adoption of inflation-targeting frameworks.

It is also important to highlight the difference in the relative sensitivities of interest rates to demand and supply shocks, whether global or domestic. On average, the sensitivity to supply-side shocks (including global and domestic supply shocks, as well as oil prices) is meaningfully smaller than for demand shocks. This reflects a significant variation across individual economies, however, as explored in more detail in Section V.1 and Appendix C**.** This also suggests, however, that the greater role of supply shocks in aggregate shocks over time would, all else equal, correspond to a smaller impact on the variation in

[22] The forecast horizons for the impulse responses are selected to yield the maximum (or minimum) impact on interest rates depending on each structural shock.

[23] The only exception is the sensitivity to global demand shocks, which was slightly higher over 1970-84 than 2020-24, but the sample during the earlier period is much more limited (with only 5 economies), so it is challenging to draw direct comparisons.

interest rates. Section III shows this is not what occurred, highlighting the importance of evaluating a range of characteristics of the underlying shocks (including if the shocks are global or domestic) in order to understand their impact.

IV.4. Direction of Global and Domestic Shocks

The analysis throughout this paper has aggregated across interest rate movements in both directions, assuming the effects of positive shocks are the same as for negative shocks (with the sign reversed). The effects of certain types of shocks, however, may be asymmetric. For example, Ball and Mankiw (1994) develops a model in which shocks that raise firms' desired prices generate larger price responses than shocks that lower desired prices. Weber and Wasner (2023) and Kharroubi et al. (2023) show that firms are more likely to increase prices after supply-chain bottlenecks and other positive cost shocks, as these shocks temporarily increase market power (as occurred after the pandemic). Karadi et al. (2024) and Ascari et al. (2025) model how monetary policy should respond more aggressively to inflation increases in the presence of a nonlinear (and state-dependent) Phillips curve.

To test if the impact of different shocks varies for increases versus decreases in interest rates, we estimate the baseline FAVAR model developed in Section III separately for economy-specific tightening and easing phases for monetary policy.[24] The monetary policy phases are identified using the dates of "Rate Cycles" in Forbes, Ha, and Kose (2024, 2025). **Figure 4** shows the resulting decompositions of the drivers of increases in interest rates (left column) and decreases in interest rates (right column) for each decade from the 1970s through the 2020s.[25]

Panel A of **Figure 4** provides the broader decomposition between global versus domestic shocks and shows an increasing role of global shocks (relative to all shocks) since the 1990s, including a prominent role of global shocks behind both tightening and easing phases for monetary policy over 2020-24, consistent with the results when the sample is not decomposed into easing and tightening phases. This role of global shocks is larger than that of domestic shocks for tightening phases, however, during which global shocks explain nearly half of the increases in interest rates over 1970-2024, while global shocks explain less than two-fifths of the decreases in interest rates over the same period.[26] An assessment of the <u>absolute</u> importance of the global shocks also suggests that they are responsible for more increases than decreases in interest rates; for example, global shocks explain about 4pp of the increase in interest rates over the 2020s but only 2pp of the decrease in rates over the same window.

Panel B of **Figure 4** provides the more detailed decompositions of interest rate movements into seven shocks, and to better assess the relative importance of the global and domestic shocks, Panel C

[24] While our analysis of interest rate fluctuations focuses on the decomposition of forecast error variances (second moments) throughout the paper, this subsection focuses on historical decompositions of the levels of interest rates (first moments). This is partly motivated by the limited sample size available for tightening and easing phases during some interest rate cycles (such as limited examples of tightening phases for monetary policy after the 2008 Global Financial Crisis and before the pandemic).

[25] We switch to using decades as sub-periods for this part of the analysis as turning points may not occur at the same time across economies and the decades provide a rough characterization of the time distribution of the major rate cycles. Specifically, the turning points denoting the start of tightening cycles in the G-5 economies corresponds to the following decades: 1972-80 (1970s), 1987-91 (1980s), 2003-08 (2000s), and 2021-23 (2020s). Similarly, the turning points denoting the start of easing phases includes: 1974-78 (1970s), 1980-89 (1980s), 1990-99 (1990s), 2001-15 (2000s), and 2019-22 (2020s).

[26] In the case of large five economies (G-5), the global shocks explained almost all of the increases in interest rates over the 1990s, 2000s and 2020s.

decomposes just the global shocks and then just the domestic shocks for each subperiod into the contributions of supply, demand and monetary policy shocks (with oil prices broken out but included as global supply shocks in this discussion).

For the global shocks, the sources are fairly similar across both tightening and easing phases. Global demand shocks are the dominant global driver of both tightening and easing policy during almost every decade. Global supply shocks (and particularly oil price shocks) have also played a meaningful role in both increases and decreases in interest rates, explaining around 1.4 percentage point of both tightening and easing phases on average across the sample. The role of global supply shocks increases sharply in explaining rate increases in the 2020s, however, consistent with the evidence above of both the larger magnitude of global supply shocks combined with the increased sensitivity of interest rates to these shocks. Global monetary policy shocks play a relatively minor role in explaining interest rate movements in both directions—particularly since 2000.

In contrast, the sources of the domestic shocks vary notably across tightening and easing phases—as well as differing from that of the global shocks. Demand shocks are the dominant domestic drivers of tightening phases (as found for global shocks), but play a more muted role in easing phases, and almost no role in easing phases since 2000. Instead, monetary policy shocks are the dominant domestic driver of easing phases, particularly since 2000. Noteworthy is that during tightening phases, domestic monetary policy contributes to lower rates in the 2000s and 2020s—the opposite direction than that of comparable global monetary policy shocks. This dominant role of domestic monetary policy shocks in driving the reductions in interest rates—even when controlling for other shocks and when these other shocks suggest interest rates should be increased—indicates a greater willingness of central banks to lower rates than suggested endogenously by the other variables in our model. Also, in contrast to global supply shocks, domestic supply shocks play only a minor role in interest rate increases since the 1970s and interest rate decreases since the 2000s, with almost no role in the most recent easing and tightening cycles over 2020-24.

Finally, a comparison of the drivers of increases in interest rates over the 2020s compared to the 1970s highlights the changing role and sources of global shocks in tightening phases. During the latter period, interest rates increased by about 6 percentage points on average, with global shocks explaining about two-thirds of this increase, including a 2 percentage point contribution of global supply and oil price shocks and 1.5 percentage point contribution of global demand shocks, (with only an 0.5 percentage point contribution of global monetary policy shocks). In contrast, in the 1970's domestic shocks explained over 60 percent of the 10 percentage points of tightening, reflecting a combination of a larger role for domestic demand, domestic supply and domestic monetary policy shocks. During this earlier period, global supply and oil price shocks contributed less than 1 percentage points to the even larger tightening—despite the sharp increases in oil prices. This suggests that central banks were more willing to "look through" the impact of global supply shocks in the 1970s and 1980s than over 2020-24, an issue explored in more detail in the next section.

IV.5. Looking Through: Global and Domestic Shocks to Interest Rates Inflation and Growth

Many pieces of the analysis above have highlighted the increased role of global supply shocks in explaining the variation in interest rates over time—and particularly over 2020-24. Standard models of optimal monetary policy suggest that, in some circumstances, monetary policy can "look through" supply shocks, i.e., respond less forcefully to changes in inflation that are expected to be "transitory" and short-lived. If so, a decomposition of the drivers of fluctuations in inflation and output growth should find a larger role for supply shocks (both global and domestic) in explaining the variation in these macroeconomic variables than for the same decompositions explaining the variation in interest rates. Moreover, just as global shocks differ from comparable domestic shocks along several dimensions, there may also be differences in the extent to which central banks "look through" the impact of global versus domestic supply shocks on inflation.

To better understand these issues, we return to our baseline FAVAR model described in Section II and estimate the average variance decompositions for inflation and output growth over the full-sample period (1970-24) and the five sub-periods in **Table 1** and **Figure 5**. The comparable results for interest rates are repeated from above to simplify comparisons. The top panel of the figure shows the decompositions into global and domestic shocks, and the bottom panel shows the decompositions into the seven structural shocks.

This set of results shows several noteworthy patterns. First, the importance of the global shocks to inflation and output growth is larger over the full sample period than for interest rates, but this masks different evolutions of the role of global shocks over time across macroeconomic variables. While the role of the global shocks has roughly tripled from 1970-84 to 2020-24 for interest rates, it has not increased over the different time periods for inflation or growth.[27] As a result, the role of global shocks was larger for interest rates at the end of the sample (at 49%), then for inflation and output growth (at 33% and 35%, respectively).

Second, the aggregate role of supply shocks (both global and domestic) in explaining the variation in different macroeconomic variables is consistent with models suggesting that at least some of the impact of supply shocks on inflation and output can be looked through. Supply shocks explain 18% of the variation in interest rates over the full period, versus 41% and 43% for inflation and output, respectively. The role of supply shocks increased over time for interest rates, with a peak contribution of 28% over 2020-24, but this contribution was still lower than the contribution of supply shocks to inflation and output growth during each period. In contrast, demand shocks (both global and domestic) play a relatively more important role for interest rates, explaining 43% to the variation of interest rates over 1970-2024, as compared to 32% and 29% of the variation in inflation and output growth, respectively. These patterns are consistent with monetary policy being more responsive to demand shocks (for which there are no tradeoffs between supporting activity and price stability), while monetary policy does not need to fully respond to the effects of supply shocks on inflation and output (and may need to balance tradeoffs in the impact on different macroeconomic variables[28]).

Finally, decomposing these supply shocks into their global and domestic components highlights how the role of global supply shocks differs meaningfully from that of domestic supply shocks for the macroeconomic variables. Domestic shocks are the primary source of supply shocks for inflation and output growth, while global supply disturbances have become the primary source of supply shocks for interest rates. The rising influence of supply shocks on interest rates is entirely driven by the growing impact of <u>global</u> supply shocks—but this increased role does not occur for inflation or output growth. In fact, the contribution of global supply shocks to interest rates is about 20% over 2020-24, much larger than the 13%–14% for inflation and output growth. This larger role of global supply shocks on interest rates than inflation and growth is the opposite pattern from that of domestic supply shocks (and supply

[27] The role of the global shocks only increases for output growth at the very end of the sample—in 2020-24—but this reflects the unusual volatility in output around the pandemic.

[28] For a more detailed discussion of these types of tradeoffs for monetary policy, see Forbes, Ha and Kose (2025).

shocks overall). This also suggests that although monetary policy has looked through some of the effects of domestic supply shocks, it has not recently looked through the impact of global supply shocks.

This series of results suggests that monetary policy is not mechanically adjusted in response to changes in inflation and output. Instead, the sources behind the variation in inflation and output appear to affect any corresponding adjustment in interest rates, with less responsiveness to domestic supply shocks than demand shocks, but more responsiveness to global supply shocks than domestic supply shocks. These patterns are also consistent with the results discussed briefly in Section II.3 and in Appendix B, discussing the global factors in interest rates, inflation, and growth. These results showed a greater increase in the global factor in interest rates than for the other macroeconomic variables, suggesting interest rates had become more "globalized" than inflation and growth. The more detailed shock decompositions in this section explain why: the increased role of global supply shocks, which have a larger impact on interest rates than inflation and output and also a larger impact on interest rates than domestic supply shocks.

V. Extensions and Robustness Exercises

This section reports a series of exercises examining extensions and the robustness of the headline results reported above. We focus on five sets of analyses: differences in key results across countries (instead of the averages that are the focus of the rest of the analysis), alternative definitions for key global and domestic variables, excluding the largest economies, excluding periods of heightened macroeconomic volatility, and alternative modelling specifications and identification schemes. We focus on the baseline FAVAR estimates decomposing the variation in interest rates into global and domestic shocks, as well as the more disaggregated set of seven shocks, for our sample of 13 advanced economies from 1970-2024. A subset of these results is summarized in **Table 2,** with the key results robust to each of these exercises.

V.1. Importance of Shocks Across Individual Economies

Most of the results reported throughout this paper are the averages across the advanced economies in our sample. These averages, however, can mask important differences in these relationships across economies. For example, interest rates, inflation and output growth in some economies may be more sensitive to global shocks if they are more interconnected with the global economy through trade or financial flows, or more vulnerable to specific types of global shocks (such as oil price fluctuations) based on their economic structure. Therefore, it is also useful to examine the disaggregated results for individual economies.

Figure 6 shows results from estimating our FAVAR model for the G-5 economies (Canada, the euro area, Japan, the United Kingdom, and the United States), when the shocks explaining the variation in interest rates are decomposed into global and domestic components (left) and then the full seven shocks (right). Results for the full period are in Panel A and then just the post-pandemic period in Panel B. Additional details for this group of countries, as well as results for the other eight advanced economies in our sample are in Appendix C. Each of the 13 economies in our sample experienced a sharp increase in the role of the global shocks in 2020-24, as well as a sharp increase in the role of global supply shocks, as found for the sample average (in Sections III and IV).

Within the G-5 economies, the most notable differences are between the euro area and the other advanced economies. In the euro area, global shocks explain 62 percent of the total variation in interest rates over the full sample period, while in each of the other economies, domestic shocks explain a majority of the variation. This larger role of global shocks for the euro area likely reflects the region's stronger international trade and financial linkages and much deeper integration with global supply chains.[29] The differences since 1999 may also reflect institutional features of the European Central Bank, including its greater commitment to inflation targeting as a relatively younger central bank; its asymmetric inflation target for part of this period (i.e., inflation below 2% for much of the sample instead of the symmetric target for central banks such as the Bank of England and Federal Reserve Board); and heightened sensitivity to regional fragmentation risks resulting from external shocks.

There are also noteworthy differences in the role of supply versus demand shocks between the euro area and the United States (and other G-5 economies). For example, demand shocks (both global and domestic) explain 45 percent of the variation in US interest rates over the full sample period, and supply shocks only 16 percent, while in the euro area, supply shocks explain 29 percent of the variation, while demand shocks explain 39 percent. The composition of demand and supply shocks is also different for the euro area, with larger shares of each shock coming from global instead of domestic sources. Finally, many of these differences between the euro area and other G-5 economies are accentuated during the pandemic and post-pandemic period from 2020-24. More specifically, the role of global shocks increased sharply to explain almost all the variation in interest rates in the euro area (89 percent) in the latest window—much more than in any of the other G-5 economies. In other words, monetary policy in the euro area was largely a response to shocks "from heaven".

V.2. Alternative Measures of Key Global and Domestic Variables

Next we explore whether these results are sensitive to how we measure global and domestic variables that are central to the analysis. First, instead of focusing on nominal oil prices, we use real oil prices (nominal oil prices adjusted for US CPI). Second, instead of estimating the global factor for output growth based on the growth in industrial production for each of the economies in our sample, we simply use the global economic activity index estimated by Kilian (2009)—thereby capturing a broader measure of global growth than for the advanced economies in our sample. Third, instead of estimating the global factors for interest rates, inflation and output growth using our dynamic factor model (discussed in Section II.3), we calculate each of the global variables using simple weighted averages for each of the respective variables for the economies in our sample (based on nominal US dollar GDP weights). Fourth, instead of using headline CPI inflation, we use core CPI inflation (to measure inflation in each economy as well as to calculate the global inflation factor). Finally, instead of measuring interest rates using domestic shadow interest rates or short-term market rates, we use domestic policy interest rates (for each economy as well as to calculate the global interest rate factor). As noted above, the policy rate has smaller variations than shadow or market rates, particularly during the period when interest rates were at lower bounds in many advanced economies.[30]

Table 2 (top set of rows) reports key coefficients for a subset of these results using these alternative definitions for the global and domestic variables, with the baseline results reported in the top line for

[29] The dominant role of the global shocks in euro area interest rate cycles is consistent with other studies in the global business cycle literature, such as Ha et al. (2025), which reports a larger share of the global factor or global output factor in the euro area than other economies

[30] The interest rate that the central bank identifies as the policy rate has changed over time in most countries, and we use the rate identified as the policy rate by the BIS in each year. Also, in earlier periods many central banks had different operating frameworks and targets other than inflation, leading to substantially more volatility in the policy rate when this was not the central bank's primary operating tool.

comparison. Results for the full-sample period (1970–2024) are in **Panel A,** and for the post-pandemic period (2020–24) in **Panel B**.

Key results, particularly on the role of the global shocks and the contributions of the different sources of the global shocks, remain broadly consistent across the different variable definitions.[31] In fact, in some of these extensions, and particularly for the 2020-24 period, the contribution of the global shocks is estimated to be even larger than in our baseline. The modification that generates the largest fall in the contribution of the global shocks in the 2020-24 period is when interest rates are measured using policy rates (instead of shadow or market rates). This is not surprising as using the policy rate misses key adjustments in monetary policy when rates were around lower bounds and central banks relied on tools other than adjustments in the policy rate to ease monetary policy.

V.3. Excluding Large Economies

We evaluate the extent to which our results are affected by developments in the two largest economies—the United States and the euro area. Given the size of these economies, macroeconomic developments could quickly and meaningfully affect the global variables and estimates of the global factor. As discussed in Section II.1, our FAVAR model does not impose any restrictions on the relationships between the global and domestic variables other than within a given month, thereby allowing for possible spill-back effects from each economy to global variables. The only restrictions are zero contemporaneous relationships (i.e., within a month). This assumption may not be valid, however, if there is a rapid spillover within a month. Since these types of spillovers are more likely to occur from the largest economies, we repeat the baseline analysis but exclude the United States and/or the euro area.

Results are shown in the middle rows of **Table 2.** The variance contributions of the shocks to interest rates remain similar to the baseline estimates for both the full sample period (1970–2024) and the post-pandemic period (2020–24). That said, excluding the euro area results in a moderate decline in the variance contribution of global shocks in both windows. This is expected as the role of the global shocks is substantially larger for the euro area than the other economies (as discussed in Section V.1), so removing this observation would mechanically cause the averages (that are the focus of the discussion above) to decline.

Also, it is worth noting that the results of the dynamic factor model (discussed in Section II.3 and Appendix B) are basically unchanged when the United States or the euro area is excluded from the analysis. In other words, the estimated global factors do not appear to primarily reflect dynamics in the United States or euro area.

V.4. Excluding Periods of Heightened Macroeconomic Volatility

We next test for the impact of excluding two periods of heightened macroeconomic volatility: the pandemic period (either just 2020 or from 2020-2024) and the early period of large oil shocks and high inflation (1970-84). As highlighted at several points throughout this paper, these two periods are characterized by large global and/or domestic shocks, which could disproportionately influence the estimates for the full-sample period or the relevant subsample. Although our baseline FAVAR specification accounts for time-varying shock volatility, it is worth checking the robustness of our empirical findings to excluding these two windows of heightened volatility. Specifically, we estimate the same FAVAR models

[31] That said, we observe some sensitivity in the country-specific results. For instance, in the sensitivity tests using the weighted averages for the global variables, the contribution of global shocks to interest rates increases for the U.S. and Canada and declines for the euro area.

for three additional subsample periods that exclude periods of heightened volatility: 1970–2019, 1985–2024, and 2021–24.

Key results are reported in rows near the bottom of **Table 2** and are generally in line with those from the full sample period (1970–2024). Starting with estimates for the longer window (Panel A), omitting the post-pandemic years (i.e., only including 1970-2019) results in a moderate decline in the contribution of the global shocks relative to the baseline (falling from 16.4% to 15.9%), while excluding the early sub-sample period (i.e., only including 1985-2024) corresponds to an increased contribution of global shocks (25.3%). Both of these changes are mechanically expected given the longer trend of the role of the global shocks increasing over time—such that dropping an earlier (later) period would generate an increase (decrease) in the contribution of the global shocks even if there was no change in volatility.

Shifting to the results for the most recent period from 2020-24 (Panel B), excluding 2020 when the pandemic generated the most extreme movements in output growth corresponds to an estimated increase in the average variance contribution of the global shocks relative to the baseline. This suggests that the heightened role of global shocks in the interest rate fluctuations over 2020-24 is not solely driven by the heightened volatility during the most extreme year of the pandemic. Instead, the substantial increase in the role of global shocks over the latest period appears to primarily reflect the inflation surge over 2021-23 and corresponding monetary policy responses.

V.5. Alternative Model Specifications and Identification Approaches

As a final set of robustness exercises, we estimate alternative model specifications for our baseline FAVAR model, including different formulations to capture global supply shocks.

We begin with the baseline model and estimate two different specifications: incorporating time-varying coefficients (instead of time-fixed coefficients) and alternative sign restrictions which require a longer (two-month) period of sign constraints (instead of the one-month in the baseline). These results are reported at the bottom of **Table 2.** There is no meaningful change in the headline findings, and the contribution of the global shocks to the variation in interest rates is slightly larger than in the baseline (in the full period as well as in just the last period).

Next, in a series of additional tests, we use more detailed measures of different global supply shocks, including not only oil price shocks, but also geopolitical risk (measured using the GPR index from Caldara and Iacoviello 2022) and supply chain disruptions (measured using the GSPCI index from the Federal Reserve Bank of New York). We use several different Cholesky identification schemes to attempt to better understand the relative importance of these different shocks. The main results are consistent with the key results highlighted throughout this paper, but also suggest that the drivers of the global supply shocks vary meaningfully over time. Comparisons across the 55 years in the baseline sample are difficult as some of the more detailed measures of supply shocks are not available for earlier in this window. With this caveat, the results available suggest that supply chain disruptions are the dominant source of global supply shocks over 2020-24, with some contribution from geopolitical risk (whose role has been increasing more gradually over time), plus some contribution from oil price volatility (which makes more intermittent contributions during specific windows since 1970).

VI. Conclusions

This paper provides an in-depth analysis of the sources and characteristics of the global and domestic shocks driving interest rate fluctuations over the past 55 years in 13 advanced economies. A key result throughout the paper is that the shocks behind interest rates have changed meaningfully over time—with a much larger role for global shocks. Moreover, the characteristics of these global shocks are fundamentally different from domestic shocks along several key dimensions (even when only focusing on shocks from the same source, such as demand or supply). The global shocks that now play a greater role, particularly global supply shocks, also appear to generate stronger monetary policy responses and are less likely to be "looked through" than comparable domestic shocks, particularly when the shocks correspond to higher inflation.

These developments present a challenge for central banks, as many of their core models, frameworks, and communication strategies were developed based on the characteristics of the previously dominant domestic shocks. More specifically, this evolving role of the types of shocks affecting interest rates and the economy more broadly may require adjusting the standard New Keynesian models that are the workhorse for central banks. Global shocks have not only increased in volatility, but have larger effects on interest rates (after controlling for their variance), and asymmetric effects (in terms of contributing more to increases than decreases in interest rates).

The implication is that monetary policy models may need to move away from assumptions that shocks are temporary, linear, and symmetric, and instead allow for a more prominent role of global shocks (Justiniano and Preston, 2010) as well as for a larger, longer lasting, and nonlinear effects of these global shocks (Bandera et al. 2023; Cavallo et al. 2023; Karadi et al. 2024; Nuno et al. 2024; Ascari et al. 2025).[32] This will likely imply more difficult tradeoffs for monetary policy in the future. If global supply shocks are modelled as nonlinear and more persistent, any effect on inflation could be more difficult to look through, requiring central banks to assess how to balance conflicting effects of policy adjustments on inflation and employment goals. Our results provide some evidence this is already occurring—as central banks have been less willing to "look through" the recent impact of global supply shocks on inflation (as compared to a more muted response to domestic supply shocks).

Our analysis also has important implications for ongoing framework reviews. In an environment where global shocks—often beyond the control of national authorities—play an increasingly dominant role, policymakers will have more difficulty meeting domestic targets. They should evaluate whether different response functions are optimal for the more frequent, larger, and more persistent shocks, such as whether they should respond more "forcefully" to larger shocks in both directions (as recently adopted by the ECB and U.S. Federal Reserve Board). Central banks may also consider whether it remains realistic to focus on narrow numerical targets for inflation (or employment) and explore the potential benefits of approaches with more flexibility (such as ranges for inflation targets) or place greater emphasis on variables less sensitive to global shocks (such as core inflation).

Finally, and closely related, the evolving role of global shocks may present challenges for forecasting and communicating monetary policy. Global shocks are outside the control of domestic policymakers (i.e., from "heaven"), often harder to predict, and may involve non-economic origins (such as a war) that central banks would generally prefer to avoid including in their forecast unless the risks materialize. These global shocks also often correspond to larger effects on domestic economies with more difficult policy tradeoffs. All of these factors will increase uncertainty about future inflation, in turn generating a range of negative effects (such as lower investment and consumer spending, as documented in Coibion and Gorodnichenko 2025). Central banks may want to consider adjusting their strategies for forecasting and

[32] Federle et al. (2024) shows that war can significantly affect the output of nearby countries for over 8 years.

communication to take into account these challenges. For example, instead of emphasizing a central forecast with large error bands (which often receive little attention), central banks may benefit from making greater use of scenarios to capture the impact of specific global shocks. Scenario-based forecasts and guidance could better capture the uncertainty and tradeoffs, providing more clarity on how policy might respond under different types of shocks.

While the analysis in this paper improves our understanding of the evolving role of global and domestic shocks, it also leaves many unanswered questions for future research. First, while we analyze the role of global supply shocks, more granular data could allow for a deeper examination of the sources and transmission channels—such as the role of supply chains, trade networks, geopolitical tensions, and specific sectors in amplifying or dampening their domestic effects. This could be important in understanding why central banks are less likely to look through the effects of global supply shocks than domestic supply shocks. Second, while our analysis focused on advanced economies, the framework could be extended to emerging markets to evaluate if there are differences in their exposure and sensitivity to global shocks. Third (and related), our discussion focuses on common patterns and averages across our sample; a more detailed analysis of the heterogeneous results across countries could provide insights into different countries' sensitivity to these global shocks, such as the role of a country's financial and trade integration or policy frameworks. Finally, given the increasing role of global shocks and the multiple dimensions by which they differ from domestic shocks, future research could assess how these shocks are best captured in structural models and how their growing prevalence might affect optimal monetary policy design and communication. As Sun Tzu taught over 2500 years ago, it is critically important to *"know Heaven and know Earth…"*.

Table 1 Contributions of Shocks to Variation in Interest Rates, Inflation, and Output Growth

(Percent of total variation, averages across advanced economies)

A. Interest Rates

Shocks	70-24	70-84	85-98	99-07	08-19	20-24
Total Global Shocks	***16.4***	***16.8***	***17.9***	***36.4***	***38.0***	***48.7***
Oil Price	2.8	3.3	4.1	6.6	6.5	8.9
Global Supply	3.5	3.3	3.7	7.4	6.5	10.5
Global Demand	6.1	6.4	5.6	11.8	17.2	17.5
Global Monetary Policy	4.0	3.7	4.5	10.6	7.9	11.7
Total Domestic Shocks	***83.6***	***83.2***	***82.1***	***63.6***	***62.0***	***51.3***
Domestic Supply	12.1	11.8	11.9	9.5	8.8	9.0
Domestic Demand	36.4	37.2	35.8	29.1	30.1	23.1
Domestic Monetary Policy	35.1	34.3	34.3	25.0	23.1	19.2

B. Inflation

Shocks	70-24	70-84	85-98	99-07	08-19	20-24
Total Global Shocks	***28.2***	***44.4***	***17.3***	***31.7***	***27.8***	***32.7***
Oil Price	6.8	8.7	4.0	7.6	7.1	7.3
Global Supply	4.4	8.6	3.8	4.8	3.8	5.9
Global Demand	11.0	17.4	5.7	9.9	11.3	12.0
Global Monetary Policy	6.0	9.6	3.9	9.4	5.6	7.5
Total Domestic Shocks	***71.8***	***55.6***	***82.7***	***68.3***	***72.2***	***67.3***
Domestic Supply	29.9	23.3	29.6	28.3	27.4	29.4
Domestic Demand	21.1	15.5	27.5	20.4	23.1	20.6
Domestic Monetary Policy	21.1	16.9	25.6	19.6	21.7	17.2

C. Output Growth

Shocks	70-24	70-84	85-98	99-07	08-19	20-24
Total Global Shocks	***20.8***	***17.9***	***19.7***	***21.4***	***20.9***	***35.3***
Oil Price	4.6	4.9	5.3	5.4	5.7	6.0
Global Supply	4.7	3.7	4.6	5.5	4.7	8.3
Global Demand	6.3	5.0	5.3	5.4	6.1	10.1
Global Monetary Policy	5.2	4.3	4.5	5.1	4.4	10.9
Total Domestic Shocks	***79.2***	***82.1***	***80.3***	***78.6***	***79.1***	***64.7***
Domestic Supply	33.7	32.9	33.4	34.6	34.0	29.2
Domestic Demand	23.1	25.5	22.0	22.3	22.4	17.7
Domestic Monetary Policy	22.4	23.7	24.8	21.7	22.6	17.8

Note: Table shows the forecast error variance decompositions of interest rates (panel A), inflation (panel B), and output growth (panel C) over a 40-month horizon based on country-specific FAVAR models that consist of four global variables (inflation, output growth, interest rates, and oil prices) and three domestic variables (inflation, output growth, and interest rates). Sample is 13 advanced economies with monthly data over the time period indicated at the top of each column. See Appendix A for variable definitions and Section II.1 for estimation details.

Table 2 Robustness Exercises: Contributions of Shocks to Variation in Interest Rates

(Percent of total variation, averages across advanced economies)

A. Full Sample Period (1970-2024)

Description of Each Sensitivity Test			Structural Shocks: Global Total	Global Oil Price	Global Supply	Global Demand	Global Monetary policy	Domestic Total	Domestic Supply	Domestic Demand	Domestic Monetary policy
Baseline			***16.4***	***2.8***	***3.5***	***6.1***	***4.0***	***83.6***	***12.1***	***36.4***	***35.1***
Alternate measures of global and domestic variables	**Commodity Prices**	**Real oil price**	**16.4**	2.7	4.1	5.7	3.8	**83.6**	10.8	36.1	36.8
	Global Output	**Global economic activity index**	**15.9**	2.4	3.4	6.1	4.0	**84.1**	11.5	37.1	35.5
	Global Interest Rates	**Weighted average of interest rates**	**15.2**	3.1	2.9	5.8	3.5	**84.8**	12.3	37.9	34.6
	Global Factors	**Weighted average of output, inflation, interest rates**	**15.0**	3.3	3.3	4.8	3.6	**85.0**	12.4	38.2	34.3
	Domestic inflation	**Core CPI**	**16.2**	3.1	2.8	5.3	5.0	**83.8**	11.3	38.8	33.7
	Domestic interest rates	**Policy rates**	**14.5**	2.5	2.4	5.3	4.3	**85.5**	11.1	37.3	37.0
Exclude specific countries or periods	**Exclude large economies**	**Exclude US**	**16.6**	2.8	3.5	6.1	4.1	**83.4**	12.2	36.2	35.0
		Exclude EA	**16.0**	2.8	3.4	5.7	4.1	**84.0**	12.0	36.5	35.5
	Exclude periods of heightened volatility	**1970-2019**	**15.9**	2.8	3.0	7.0	3.1	**84.1**	14.1	38.8	31.2
		1985-2024	**25.3**	4.3	5.3	9.7	6.1	**74.7**	11.9	34.6	28.1
Alternative modelling frameworks	**Identification scheme**	**Sign restriction**	**16.8**	2.5	3.7	6.7	4.0	**83.2**	11.2	36.8	35.1
	Model specification	**Time-varying coefficients**	**17.8**	3.4	3.9	6.3	4.2	**82.2**	11.7	35.0	35.5

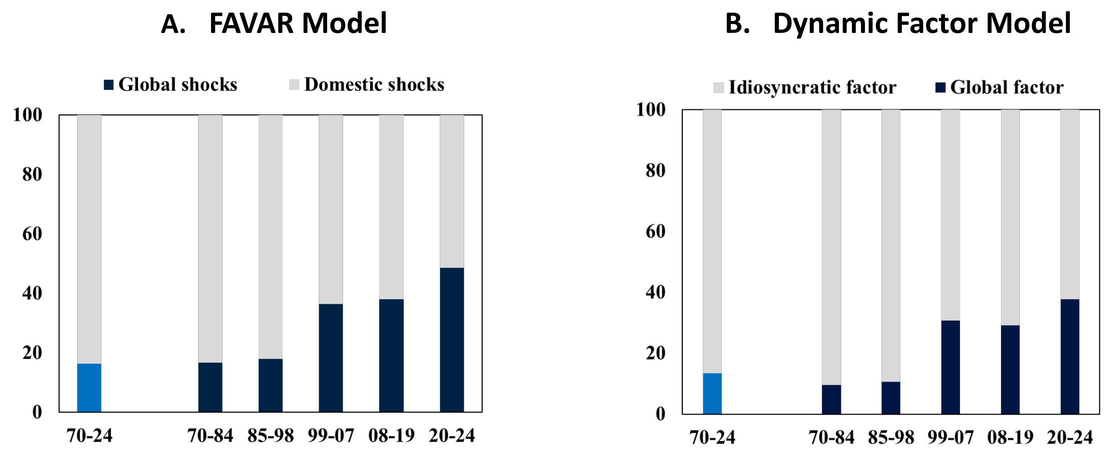
B. Post-pandemic Period (2020-24)

Description of Each Sensitivity Test			Structural Shocks: Global Total	Global Oil Price	Global Supply	Global Demand	Global Monetary policy	Domestic Total	Domestic Supply	Domestic Demand	Domestic Monetary policy
Baseline			***48.7***	***8.9***	***10.5***	***17.5***	***11.7***	***51.3***	***9.0***	***23.1***	***19.2***
Alternate measures of global and domestic variables	**Commodity Prices**	**Real oil price**	**51.0**	9.6	10.3	17.8	13.4	**49.0**	8.7	23.2	17.1
	Global Output	**Global economic activities index**	**48.8**	9.1	10.9	18.1	10.7	**51.2**	7.6	24.4	19.2
	Global Interest Rates	**Weighted average of interest rates**	**52.4**	9.1	11.1	19.7	12.6	**47.6**	8.1	22.2	17.4
	Global Factors	**Weighted average of output, inflation, interest rates**	**52.7**	10.3	9.8	19.9	12.7	**47.3**	8.5	21.7	17.2
	Domestic inflation	**Core CPI**	**47.6**	8.4	8.9	14.2	16.0	**52.4**	9.1	24.8	18.5
	Domestic interest rates	**Policy rates**	**38.4**	7.8	7.2	15.7	7.7	**61.6**	8.3	28.5	24.8
Exclude specific countries or years	**Exclude large economies**	**Exclude US**	**47.6**	8.8	10.6	16.1	12.1	**52.4**	9.3	23.9	19.2
		Exclude EA	**45.3**	8.1	9.5	17.2	10.5	**54.7**	9.6	24.7	20.4
	Exclude 2020	**2021-24**	**54.6**	10.2	11.7	22.8	9.9	**45.4**	8.4	21.8	15.2
Alternative modelling frameworks	**Identification scheme**	**Sign restriction**	**52.4**	8.9	10.2	20.7	12.7	**47.6**	8.6	21.8	17.2
	Model specifications	**Time-varying coefficients**	**50.7**	9.2	9.8	20.3	11.3	**49.3**	9.3	21.8	18.2

Note: Table shows the forecast error variance decompositions of interest rates (in percent). The top row repeats the baseline estimates from Table 1; see notes to this table for details on this baseline model, sample and data. Each subsequent row reports a robustness test with the change from the baseline described in the left columns and discussed in detail in Section V.

Figure 1 Contributions of Global Shocks and Global Factors to the Variation in Domestic Interest Rates

(Percent of total variation, averages across advanced economies)

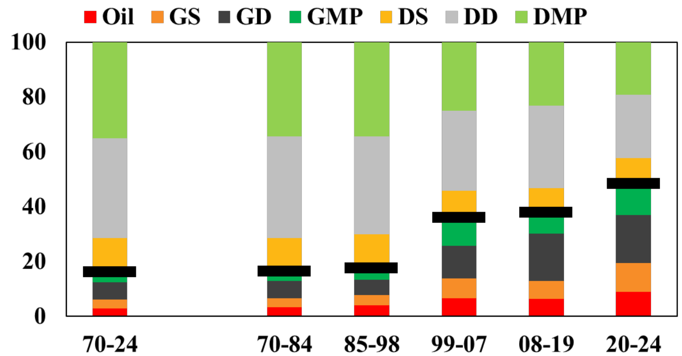


Sources: Authors' calculations based on monthly data from 1970 through 2024 for sample of 13 advanced economies. Notes: Panel A shows the forecast error variance decompositions of domestic policy interest rates over a 40-month horizon based on the FAVAR model developed in Section II.1 that consists of four global variables (output growth, inflation, interest rates, and oil prices) and three domestic variables (output growth, inflation, and interest rates). See Table 1 for underlying estimates. Panel B shows the average variance contribution of the global interest rate factor to the variations in country-specific interest rates based on the dynamic factor model in Section II.3. See Appendix B for additional details and underlying estimates.

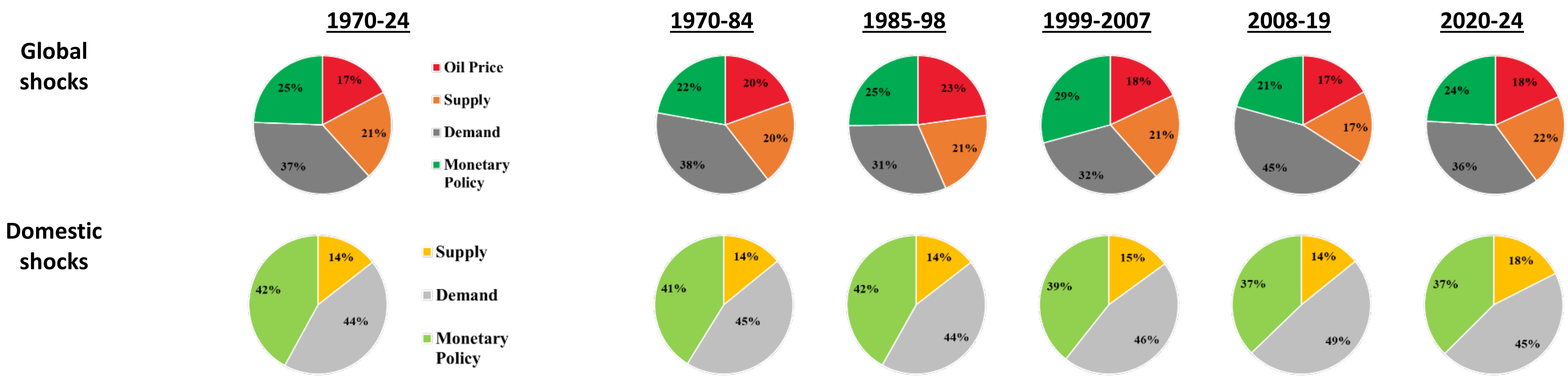
Figure 2 Contributions of Seven Shocks to the Variation in Domestic Interest Rates

(Percent of total variation, averages across advanced economies)

A. Breakdown of Structural Shocks by Source of Shock Over Time



B. Breakdown of Global and Domestic Shocks Over Time



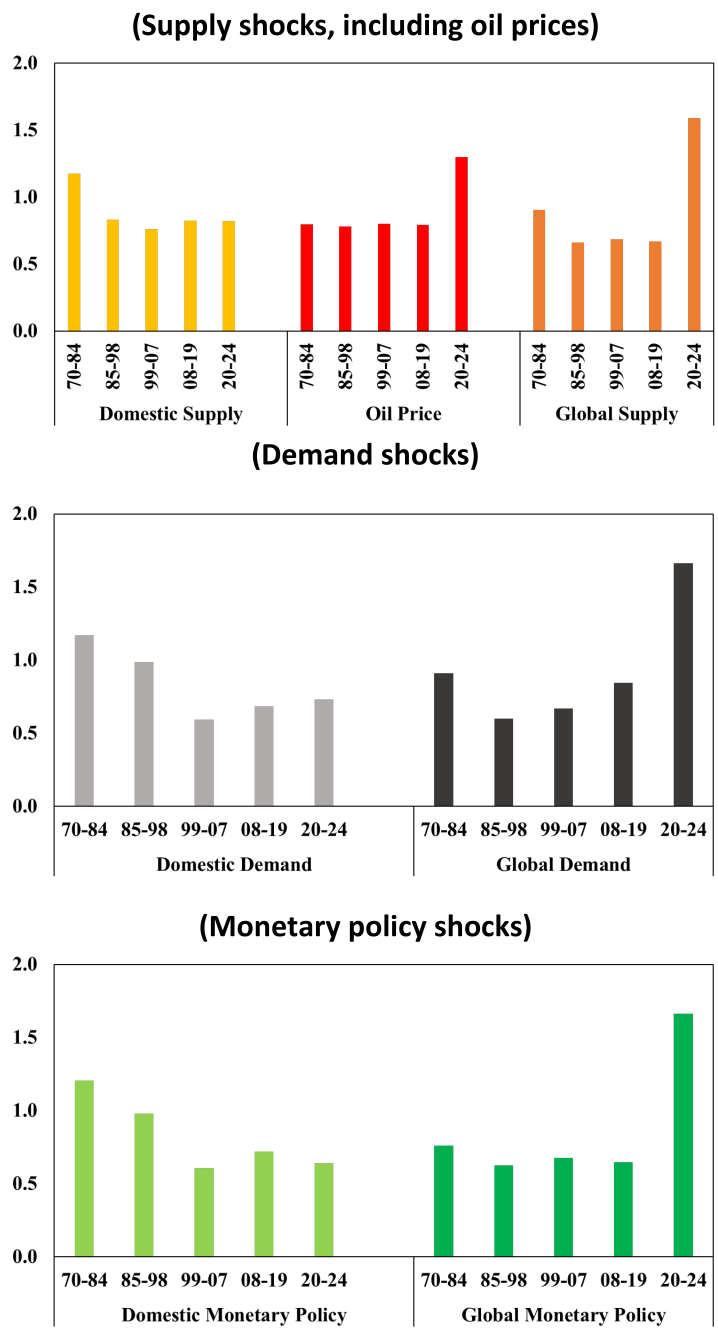
Sources: Authors' calculations based on monthly data from 1970 through 2024 for sample of 13 advanced economies.

Notes: "Oil" = oil price shock, "GS" = global supply shock, "GD" = global demand shock, "GMP" = global monetary policy shock, "DS" = domestic supply shock, "DD" = domestic demand shock, "DMP" = domestic monetary policy shock. Panel A shows the forecast error variance decompositions of domestic policy interest rates over a 40-month horizon based on the FAVAR model developed in Section II.1 that consists of four global variables (output growth, inflation, interest rates, and oil prices) and three domestic variables (output growth, inflation, and interest rates). The black horizontal lines indicate the division between the global and domestic shocks. Panel B shows the share of just the global shocks or share of just the domestic shocks by shock source.

Figure 3 Evolution of Shock Volatility and Interest Rate Sensitivity by Source of Shock

A. Shock Volatility by Source of Shock

(Averages across advanced economies, long-term volatility = 1)

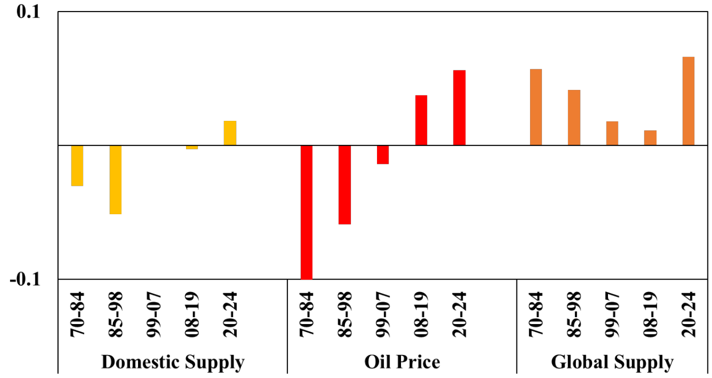


Sources: Authors' calculations based on monthly data for sample of 13 advanced economies.
Note: Figures report the volatility of the specific shock, which is normalized to be one over the full sample period (1970-2024). Shock volatilities in the sub-sample periods are calculated using the standard deviation of the shock series over the corresponding periods.

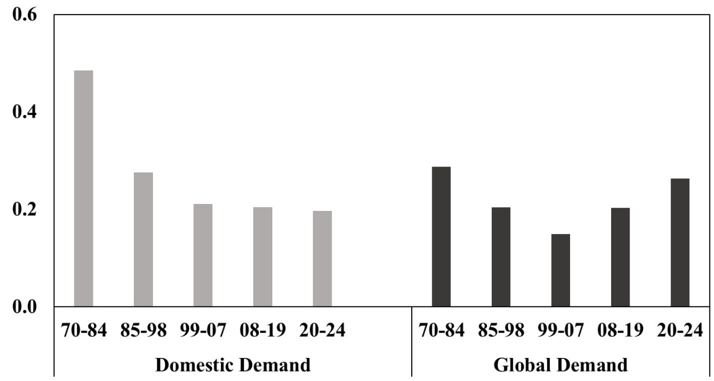
B. Sensitivity of Interest Rates to Different Sources of Shocks

(Averages across advanced economies)

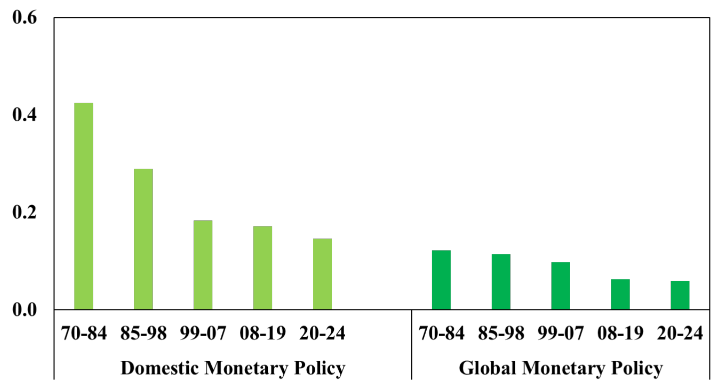
(Supply shocks, including oil prices)



(Demand shocks)



(Monetary policy shocks)



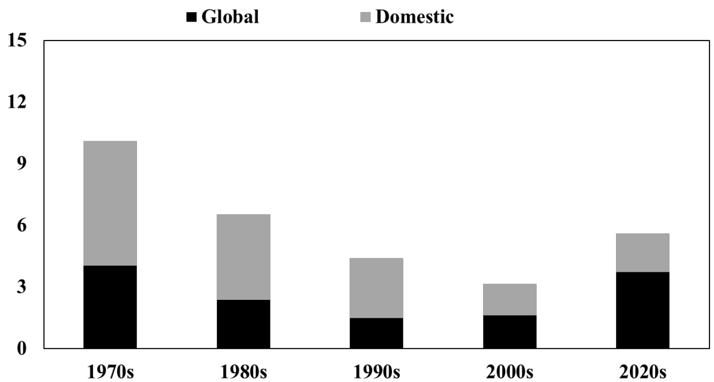
Sources: Authors' calculations based on monthly data for sample of 13 advanced economies.
Note: The figures show the average sensitivity of domestic interest rates to one standard deviation shocks over each of the five sub-sample periods.

Figure 4 Contributions of Shocks to Changes in the Levels of Interest Rates During Tightening and Easing Episodes for Monetary Policy

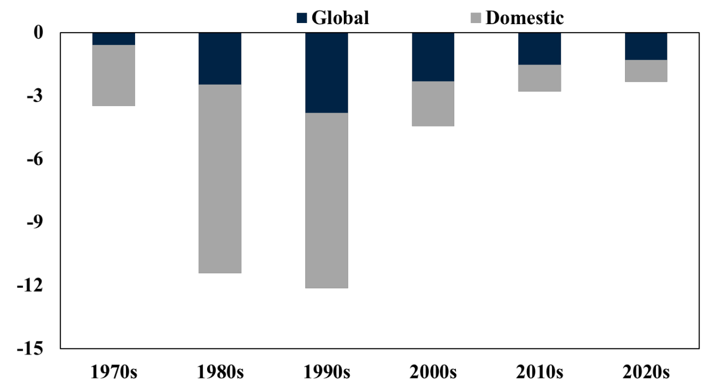
(Averages across advanced economies, in percentage points)

A. By Global and Domestic Shocks

Tightening episodes

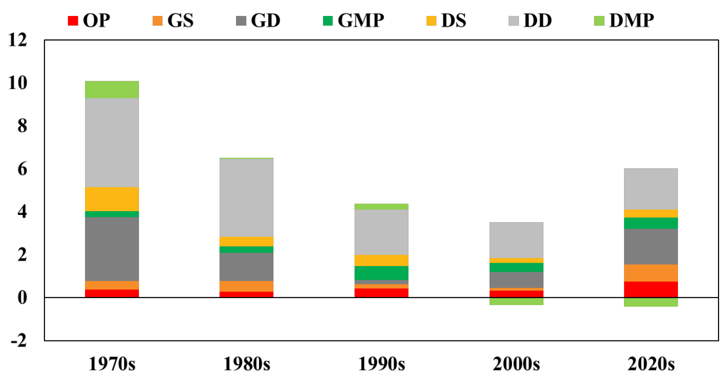


Easing episodes

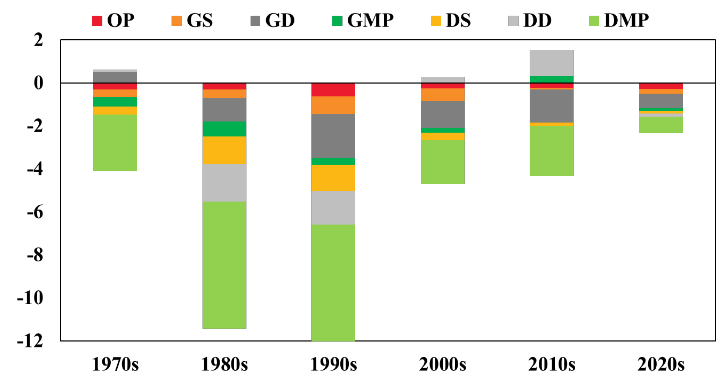


B. By Source of Structural Shocks

Tightening episodes

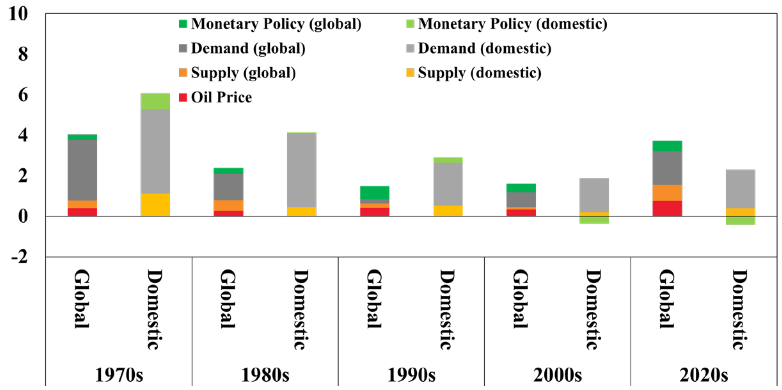


Easing episodes

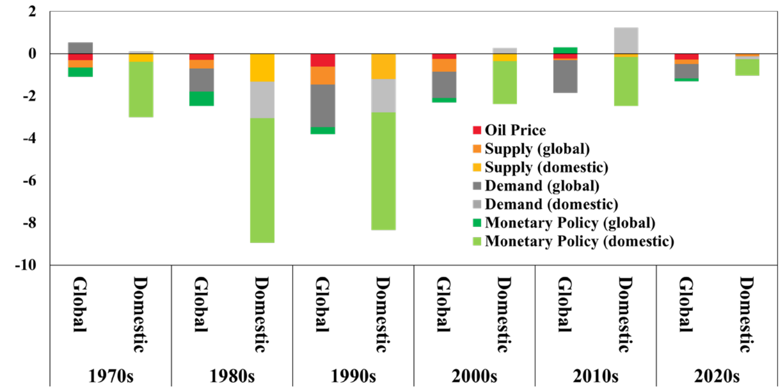


C. A Closer Look at the Weight of Global and Domestic Shocks by Shock Source

Tightening episodes



Easing episodes



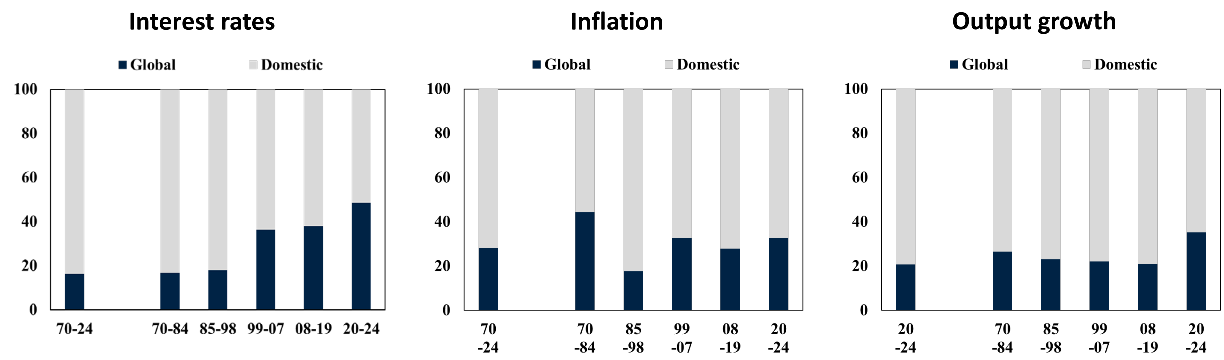
Sources: Authors' calculations based on monthly data for a sample of 13 advanced economies.

Notes: Figures show the historical decompositions of the level of domestic policy interest rates during tightening and easing phases for monetary policy. The dates for the monetary policy phases are from Forbes, Ha and Kose (2024, 2025). The estimates are based on the FAVAR model described in Section II that consists of four global variables (output growth, inflation, interest rates and oil prices) and three domestic variables (output growth, inflation, and interest rates). "OP" = oil price shock, "GS" = global supply shock, "GD" = global demand shock, "GMP" = global monetary policy shock, "DS" = domestic supply shock, "DD" = domestic demand shock, "DMP" =domestic monetary policy shock.

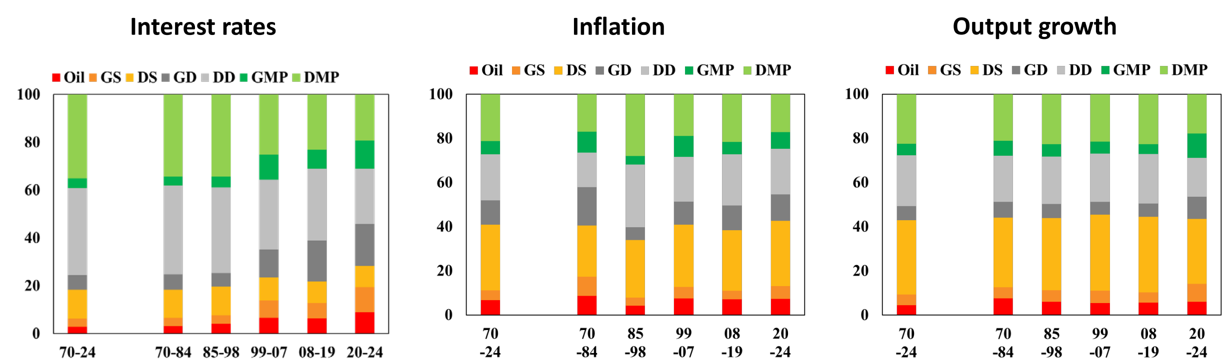
Figure 5 Contributions of Shocks to Variation in Interest Rates, Inflation, and Output Growth

(Averages across advanced economies, in percentage points)

A. By Global and Domestic Shocks



B. By Source of Structural Shocks



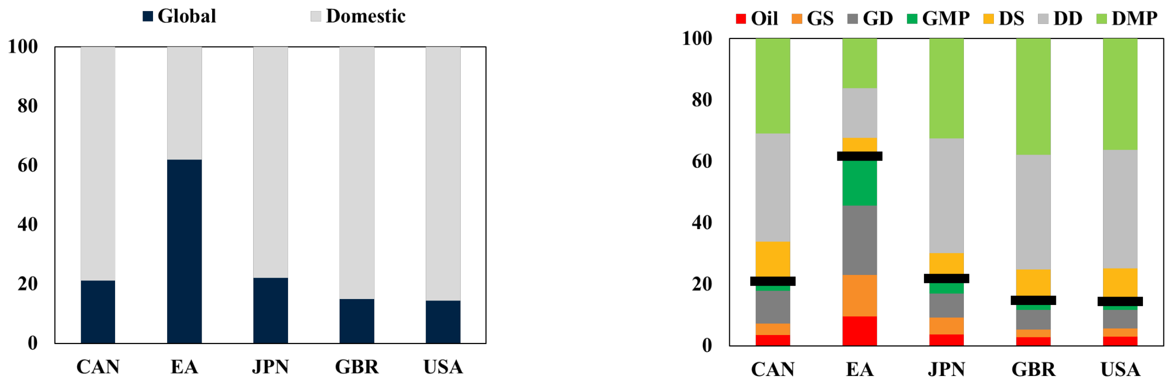
Sources: Authors' calculations based on monthly data from 1970 through 2024.

Notes: Graphs show the forecast error variance decompositions of domestic interest rates, inflation and output growth based on the FAVAR model that consists of four global variables (output growth, inflation, interest rates, and oil prices) and three domestic variables (output growth, inflation, and interest rates). "Oil" = oil price, "GS" = global supply, "GD" = global demand, "GMP" = global monetary policy, "DS" = domestic supply, "DD" = domestic demand, "DMP" =domestic monetary policy.

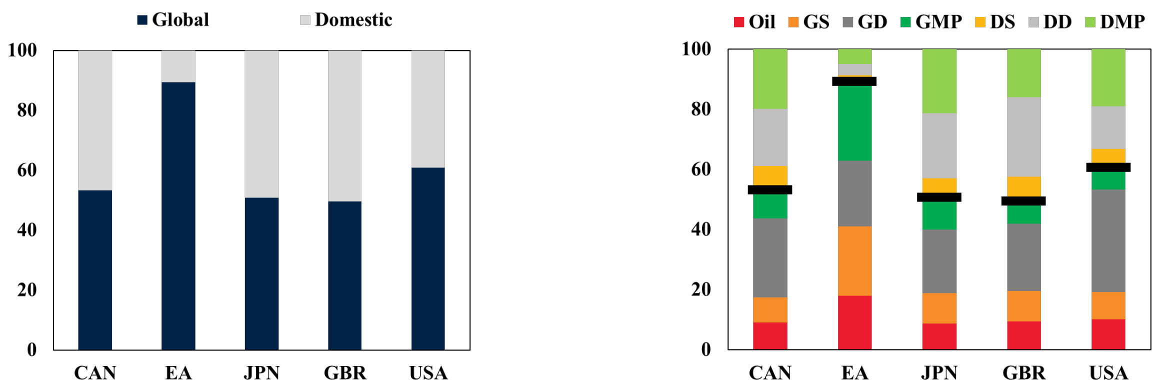
Figure 6 Contributions of Shocks to Variation in Interest Rates: G-5 economies

(Averages across advanced economies for the relevant period, in percentage points)

A. Full Sample Period (1970-2024)



B. Post-pandemic Period (2020-24)



Sources: Authors' calculations based on monthly data from 1970 through 2024.

Notes: Forecast error variance decompositions of interest rates based on the FAVAR model that consists of four global variables (global output growth, inflation, interest rates, and oil prices) and three domestic variables (domestic output growth, inflation, and interest rates). "Oil" = oil price, "GS" = global supply, "GD" = global demand, "GMP" = global monetary policy, "DS" = domestic supply, "DD" = domestic demand, "DMP" =domestic monetary policy. Horizontal lines (right charts) indicate the sum of global shocks.

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

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September 2025

Supplemental Appendix

This appendix contains:

Appendix A: Data information

Appendix Table A1 Data Appendix

Variable	Description	Source
Inflation	Headline Consumer Price Index. Inflation rates (in percent) are calculated on a month-over-month basis.	OECD, Haver Analytics
Interest rates	We use the shadow policy interest rate as estimated in Krippner (2013) if available. Data on shadow rates are available for seven economies (Australia, Canada, euro area, Japan, New Zealand, United Kingdom, United States) over 1995-2024. If not available, we use the overnight market rate, and if not available the 3-month Treasury bill yield (both from Haver Analytics). If none of these are available, we use the nominal policy interest rate used by the central bank for monetary policy from the BIS or OECD. Euro area policy rates before 1999 are GDP-weighted averages of policy rates in member countries. For each measure the rate is monthly and expressed in percent.	LJK Limited; Krippner (2013) Haver Analytics, BIS, OECD
Oil prices	Nominal oil prices (average of Dubai, WTI, and Brent oil prices). Oil price growth rates (in percent) are calculated on a month-over-month basis.	World Bank (Pink sheet database)
Output Growth	Output is measured by the industrial production (IP) index, which includes the volume of production in sectors such as mining, manufacturing, electricity, gas, steam, and air conditioning. The reference year is 2015 (OECD) unless specified otherwise. Growth rates of IP (in percent) are calculated on a month-over-month basis.	OECD, Haver Analytics

Notes: All data is at a monthly frequency and sample period is from January 1970 through September 2024. Economies included for analysis of the G-5 are: Canada, euro area, Japan, United Kingdom and United States. The majority of the analysis in the paper is for a sample of 13 advanced economies, which includes the G-5 as well as: Australia, Denmark, Israel, Korea, New Zealand, Norway, Sweden and Switzerland. If data for the euro area as a single entity is not available (including for interest rates before the ECB began setting rates for the group in 1999), we use a GDP-weighted average of member economies, which includes: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain.

Appendix B: Dynamic Factor Model and Estimation

As discussed in Sections II.3, we use a dynamic factor model to estimate the global factors for interest rates, inflation, and output that are then used in the FAVAR model.[1] This analysis allows us to calculate the share of the variance of national interest rates explained by the global factor, how this has evolved over time, as well as how it compares to the evolution of the global factors for inflation and output.

B.1 The Dynamic Factor Model and Variance Decompositions

We use a simple dynamic factor framework to estimate the following model of the global factors for interest rates, inflation, and output growth (originally developed in Ha et al. 2024):

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

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

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

where R_t^i, π_t^i, and Y_t^i refer to interest rates, inflation, and output growth in country *i* in month *t*, respectively. The $f_t^{R,global}$, $f_t^{\pi,global}$ and $f_t^{Y,global}$ are the global factors for interest rates, inflation, and output growth in month *t*, respectively. As is standard in this literature, the factors and error terms follow independent autoregressive processes. The error terms are assumed to be uncorrelated across countries at all leads and lags. We estimate the model using standard Bayesian techniques, as described in Kose, Otrok, and Whiteman (2003, 2008).

Next we use the data discussed in Section II.2 from January 1970 through September 2024 to estimate the contributions of each of the three global factors to the variances of each of the macroeconomic and financial variables. [2] The resulting estimates of the contribution of the global factors to the variance of national interest rates, inflation and output are shown in **Figure B1** (with underlying data in Appendix **Table A1**). Section II.2 discusses key insights from averages across the sample, highlighting how the importance of the global interest rate factor has increased significantly over time, and particularly since the end of the 1990s, consistent with the results of the FAVAR estimates.[3] Over the full period, the global interest rate factor accounted for the largest share of variation in the euro area (47%), followed by Switzerland (32%), Japan (17%), and Canada (12%). In the post-1999 period, the role of the global rate factor became more pronounced in almost all economies and was particularly important in explaining the interest rate variation in the United States (59%), the euro area (57%), Canada (53%), and Australia (47%), but much smaller in Japan (19%).

[1] Other studies analyzing the global factor in interest rates include: Ha et al. (2025), Chatterjee (2016), and Crucini, Kose and Otrok (2011).

[2] Due to the availability of a balanced dataset, the FAVAR estimation results for the 1970–84 period are based on 11 of the 13 advanced economies in our baseline sample. During this period, when monthly data for output growth or inflation are not available (which is more common in the non-G5 economies), quarterly data are used for interpolation. For the full sample period (1970–2024), the results include all countries, with the sample period for a few economies beginning from the earliest point at which all relevant data are available.

[3] We calculate the variance contribution of the global rate factor using other sub-sample periods (which are not based on when the ECB began setting interest rates for the euro area) or excluding some large economies (such as the United States or the euro area). The key patterns reported above on how the importance of the global rate factor has evolved over time are unchanged.

Appendix **Figure B2** shows the corresponding variance shares when they are estimated for shorter five-year windows (as compared to the longer windows in the baseline analysis. This exercise is possible for the factor decompositions, but not the FAVAR model. These estimates over shorter windows show an even more pronounced increase in the importance of the global interest rate factor starting in 1999. Interest rate cycles have become much more synchronized over the past quarter century.

B.2 Behavior of the Global Factors

Appendix **Figure B3** shows the higher frequency evolution of these global factors over time for interest rates, inflation, and output growth, all estimated using the same dynamic factor model and data. These three factors display movements that are broadly consistent with well-known fluctuations in the respective variables and that correspond to the highly synchronized periods since 1970 of interest rate adjustments, above- or below-target inflation, and weak growth.

The global interest rate factor exhibits pronounced fluctuations, typically declining sharply during global recessions and downturns (highlighted in grey) such as those in 1975, 1982, 1991, 1998, 2000–01, 2009, and 2020. These episodes often coincide with highly synchronized monetary easing across countries. In contrast, the global interest rate factor rises notably during periods of elevated inflation, which are often associated with major disruptions in oil markets, disturbances in cross-border supply chains, and strong demand pressures from rapid output growth—as seen in 1973–74, 1979–80, 1988–90, and 2021–23. The global interest rate factor spikes in 2021–22, reaching its highest level since 1979–80, and reflecting aggressive rate hikes by central banks worldwide in response to soaring inflation. Not surprisingly, the global inflation factor also jumps during these two peaks in the global interest rate factor.

The global interest rate factor also displays larger swings from the start of the sample in 1970 until the mid-1980s. This partly reflects sharper fluctuations in nominal interest rates (Cook and Hahn 1989) during periods of high inflation. It also stems from differing monetary policy frameworks across advanced economies at the time. For instance, some countries—such as the United States—emphasized money supply targets (Friedman 1982), while others—including members of the ERM—prioritized exchange rate stability. As a result, volatility in the global interest rate factor and underlying policy rates in this earlier period also reflects the impact of financial markets on interest rates, and not just central banks' decisions to adjust policy rates. The global interest rate factor was relatively stable in the 1990s and early 2000s during the "Great Moderation" (Bernanke 2004), before becoming more volatile again around the 2008-09 Global Financial Crisis and corresponding global recession. The volatility of the global rate factor also increases sharply around the COVID-19 pandemic and subsequent spike in inflation.

The behavior of the global factors for inflation and output (in the bottom two panels of Appendix **Figure B3**) also aligns closely with well-known global events. For example, the global inflation factor declines sharply around global recessions, especially those associated with the 2008-09 Global Financial Crisis and the COVID-19 pandemic, but also around the 1975 and 1982 global recessions. In addition, the global inflation factor falls during periods when oil prices decline sharply (1986, 1990-91, 1997-98, 2001, 2008, 2014-16, and 2020). The global output factor (measured by the highly volatile monthly industrial production series) shows even more short-term volatility, marked by notable plunges during global recessions and sharp rebounds during subsequent recoveries. The collapse and subsequent spike in output around the COVID-19 pandemic is particularly noteworthy and much more extreme than any other period in the sample of 55 years.

Appendix Table B1 Variance Contributions of the Global Factors

(Percent of total variation, averages across advanced economies)

A. By variables

Global factors	70-24	70-84	85-98	99-07	08-19	20-24
Interest Rates	13.4	9.6	10.7	30.8	29.3	37.7
Inflation	26.1	13.1	11.2	22.0	23.7	29.6
Output growth	23.5	7.1	10.7	15.7	13.2	48.4

B. Robustness: excluding selected large economies

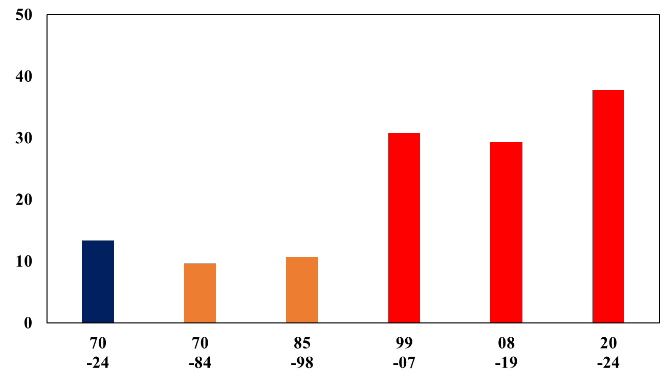
Global factors	70-24	70-84	85-98	99-07	08-19	20-24
Interest Rates (All countries)	13.4	9.6	10.7	30.8	29.3	37.7
Except United States	14.1	10.2	10.5	32.9	31.4	34.6
Except euro area	13.1	12.3	11.0	22.3	29.8	35.7

Notes: The table presents the average contributions of the global rate factor, the global output factor, and the global inflation factor to the variance of country-specific interest rates, inflation, and output growth, respectively, over the periods noted. See **Appendix Table A1** for variable definitions.

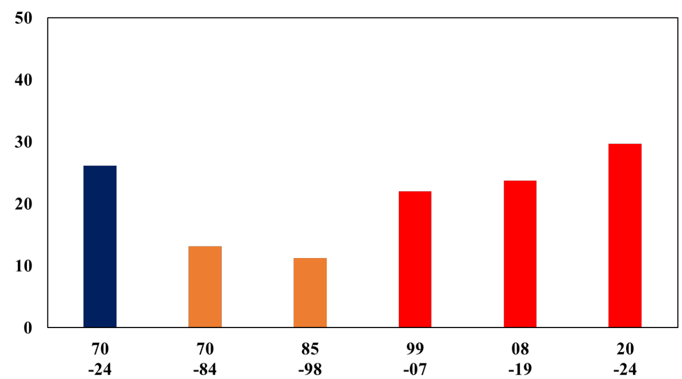
Appendix Figure B1 Variance Contributions of the Global Factors

(Percent of total variation, averages across advanced economies)

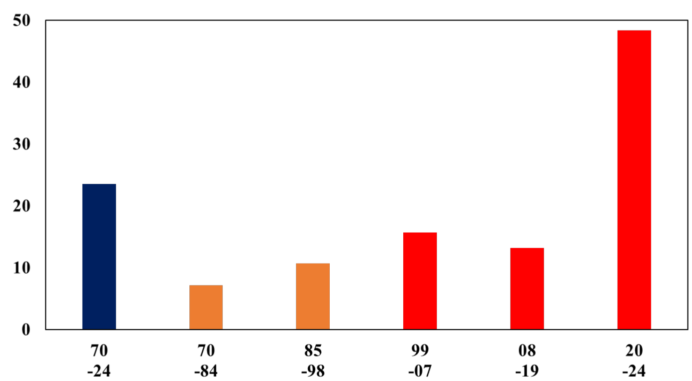
A. Interest Rates



B. Inflation



C. Output Growth

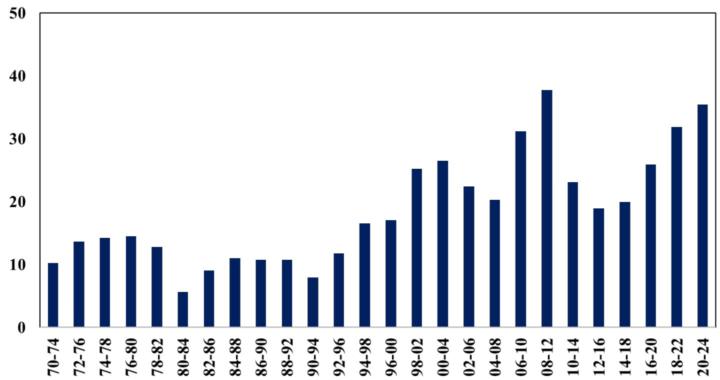


Sources: Authors' calculations based on monthly data from 1970 to 2024 for 13 advanced economies.

Note: The figure presents the average variance contribution of the global factor to the variations in country-specific interest rates, inflation, and output growth. See Appendix Tables A1 for sample and variable definitions.

Appendix Figure B2 Variance Contribution of the Global Interest Rate Factor: 5-year Rolling Windows

(Percent of total variation)

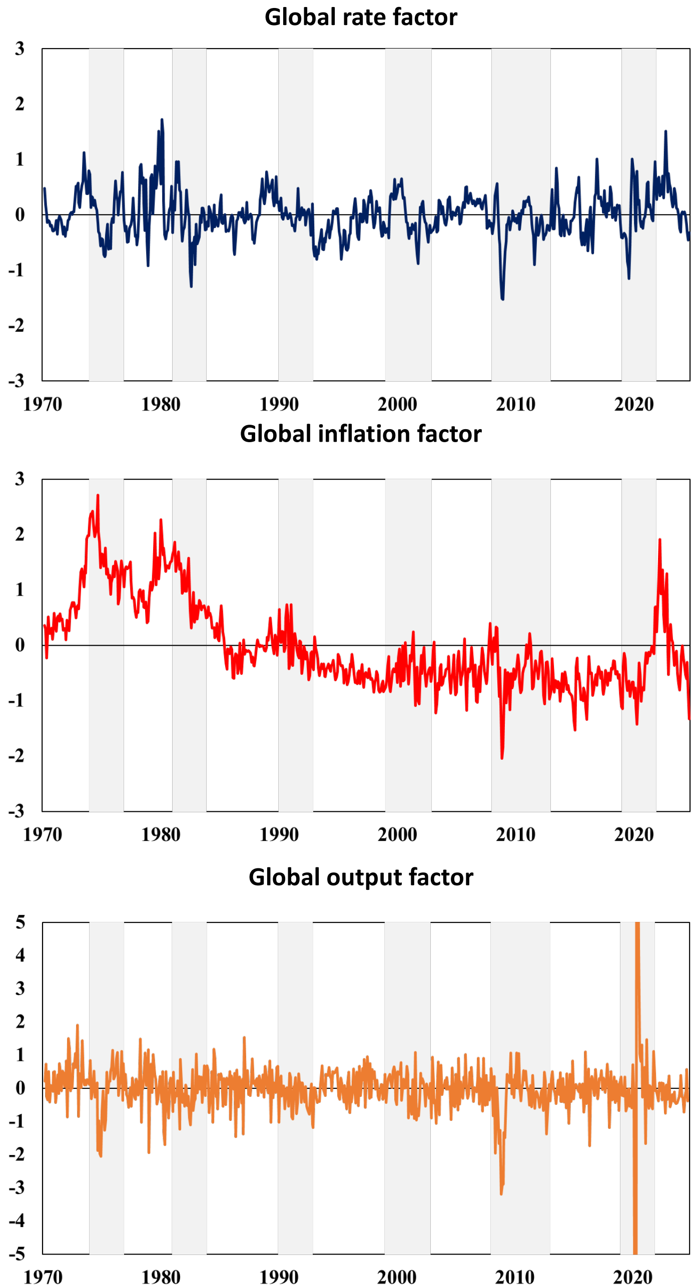


Sources: Authors' calculations based on monthly data from 1970 to 2024 for 13 advanced economies

Notes: The chart presents the average variance contribution of the global interest rate factor to the variations in country-specific interest rates over five-year windows. See Appendix Tables A1 for sample and variable definitions.

Appendix Figure B3 The Evolution of the Global Factors over Time

(Percent)



Sources: Authors' calculations based on monthly data from 1970 to 2024 for 13 advanced economies

Notes: Global factors for interest rates, inflation, and output growth are estimated using a one-factor dynamic factor model for cross-country data on interest rates, inflation, and output growth (measured based on industrial production). Shaded areas indicate global recessions and downturns as defined in Kose, Sugawara, and Terrones (2020). See Appendix Tables A1 for sample and variable definitions.

Appendix C: Results for Individual Economies: The Role of Global and Domestic Shocks

This paper primarily focuses on the average drivers of interest rates, inflation and output growth over time for a panel of 13 advanced economies. This approach allows us to identify patterns that are typical across these economies, but this focus on averages (or medians, which yield similar results) can mask important differences in these relationships across economies. For example, inflation and output in some economies may be more sensitive to global shocks if they are more interconnected with the global economy through trade or financial flows or more vulnerable to specific types of global shocks (such as oil price fluctuations).

This appendix takes a more disaggregated approach, reporting results for individual economies and highlighting results during the post-pandemic period. The empirical findings indicate that global and domestic shocks play distinct roles across individual economies, differences which can help explain differences in their monetary stances at certain points in time.

Section V.1. of the paper discusses the results for individual economies in the G-5 (Canada, the euro area, Japan, the United Kingdom and United States)**,** with key results shown in **Figure 6**. Global shocks explained around one-fifth of the total interest rate variation over the full period from 1970-2024 in the United States, the United Kingdom, Canada, and Japan. In the euro area, however, global shocks accounted for only 62 percent of the variation, overshadowing the role of domestic shocks (at 38 percent). This pattern is not driven by outsized shocks during one specific period, but consistent across each of the sub-periods. Over 2020-24, when the role of global shocks increased to explain over 50 percent of the variation in interest rates in all G-5 economies, the role of global shocks was even more dominant in the euro area (at 89 percent). This larger role of global shocks for the euro area likely reflects the region's stronger international trade and financial linkages and much deeper integration with global supply chains. It is also consistent with other studies in the global business cycle literature.[4]

This set of results for the G-5 also highlights a much larger role of supply (versus demand) shocks, not differentiating by their global versus domestic nature, for the euro area as compared to the United States (and other G-5 economies). The more substantial role of supply shocks in the euro area is also apparent in the decompositions of the shocks explaining inflation and output. For example, although supply shocks play a greater role than demand in explaining the variation in inflation in each economy in 2020-24, they play the largest role in the euro area (although only slightly more than in Japan and the United Kingdom). For example, in the euro area, supply shocks drive a majority of the variation in inflation over 2020-24 (51 percent), while demand shocks contributed only 24 percent. In contrast, in the United States, supply shocks explain only slightly more of the variation in inflation than demand shocks (40 percent versus 38 percent) during this period.

These differences are intuitive. The euro area was more reliant on oil, natural gas, and food imports from Russia and Ukraine, while the United States is a net exporter of both food and energy, and benefited from a greater demand boost due to multiple large fiscal packages. The inflation decompositions in the other G-5 economies fall between those of the euro area and the U.S., with supply shocks contributing around 46 percent over 2020-24, compared to 28-33 percent for demand shocks, with a larger role of domestic supply shocks in Japan and the United Kingdom.

[4] For example, Ha et al. (2025) reports a larger share of the global factor or global output factor in the euro area than other economies.

Next, we shift to the results for the other advanced economies in our sample that are not in the G-5, with a subset of results reported in **Appendix Figure C1**. In most (but not all) cases, the main results are similar to those for the larger advanced economies. For example, the contribution of the global shocks increased over time in all economies in this sample, once again with a more notable increase over 2020-24. The relative differences in the importance of global versus shocks across countries, however, is fairly consistent across time; in other words, even as the role of global shocks increased across all economies, countries more sensitive to global shocks continued to be more sensitive in the different subperiods.[5] This suggests that structural factors—such as the monetary policy framework, share of commodity imports, or financial and economic openness—play a role in explaining these cross-country differences.

Among the non-G5 economies, interest rate fluctuations in Switzerland are far more sensitive to global shocks than the other advanced economies over the full sample period from 1970 to 2024, and (unreported) estimates for individual members of the euro area suggest that Germany and Portugal are also more sensitivity than other advanced economies and members of the euro area. Many of these cross-country differences are accentuated during the pandemic and post-pandemic period from 2020-24. For example, the role of global shocks increased sharply to explain almost all of the variation in interest rates in Switzerland (at 85 percent), suggesting that monetary policy in this economy was largely a response to shocks "from heaven" (as also found for the euro area).

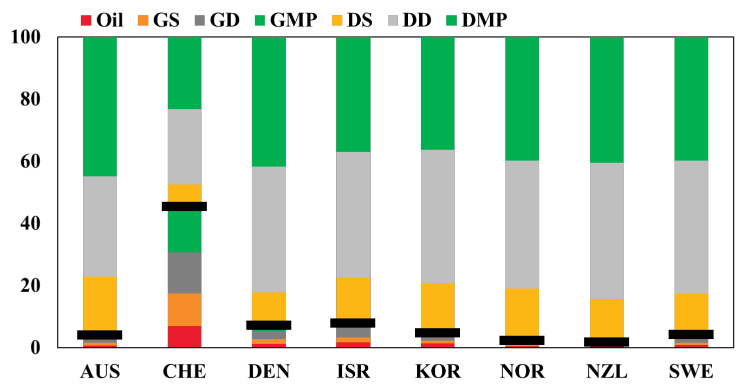
It is also worth noting that the contributions of different types of shocks to the variation in interest rates are usually consistent with the relative shares explaining the variation in inflation and output growth. This is not surprising; economies for which inflation or output growth are more sensitive to global shocks are more likely to adjust interest rates in response to these global shocks. Monetary policy reaction functions typically depend on both future and past inflation and output growth. There are, however, some notable exceptions for which the role of different shocks varies across macroeconomic variables. For example, in Switzerland, the role of global shocks is substantially larger in explaining the variation in interest rates than inflation or output growth—likely reflecting the important role of Switzerland in the global financial system.

[5] This is supported by scatter plots of the relative share of global shocks in the variation in interest rates for each country across different sub-samples. The correlation of these shares across samples is 80 percent.

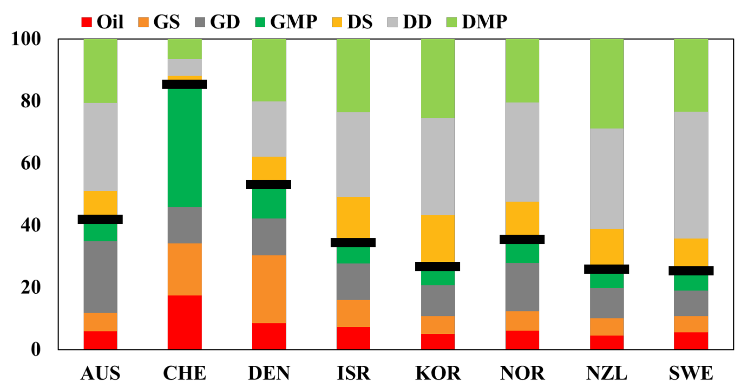
Appendix Figure C1 Contributions of Shocks to Interest Rates in non-G5 Advanced Economies

(Percent of total variation)

A. Full Sample Period (1970-2024)



B. Post-pandemic Period (2020-24)



Sources: Authors' calculations based on monthly data over time period listed at top of each panel.

Notes: Forecast error variance decompositions of domestic interest rates based on the FAVAR model that consists of four global variables (global output growth, inflation, monetary and oil prices) and three domestic variables (domestic output growth, inflation, and interest rates). "Oil"= oil price shock, "GS" = global supply shock, "GD" = global demand shock, "GMP" = global monetary policy shock, "DS" = domestic supply shock, "DD" = domestic demand shock, "MP" =domestic monetary policy shock. The dark horizontal lines indicate the total contribution of global shocks.