Crawford School of Public Policy

CAMA

Centre for Applied Macroeconomic Analysis

Understanding the Global Drivers of Inflation: How Important are Oil Prices?

CAMA Working Paper 3/2023
January 2023

Jongrim Ha
World Bank

M. Ayhan Kose
World Bank
Brookings Institution
CEPR
Centre for Applied Macroeconomic Analysis, ANU

Franziska Ohnsorge
World Bank
CEPR
Centre for Applied Macroeconomic Analysis, ANU

Hakan Yilmazkuday
Florida International University

Abstract

This paper examines the global drivers of inflation in 55 countries over the 1970–2022 period. We estimate a Factor-Augmented Vector Autoregression model for each country and assess the importance of several global (demand, supply, and oil price) and domestic shocks. We report three main results. First, global shocks have explained about 26 percent of inflation variation in a typical economy. Oil price shocks accounted for only about 4 percent of inflation variation, but they had a statistically significant impact on inflation in three quarters of countries. Second, global shocks have become more important in driving inflation variation over time. The share of inflation variance caused by oil price shocks increased from 4 percent prior to 2000 to roughly 9 percent over the 2001–2022 period. They also accounted for some of the steep runup in inflation between mid-2021 and mid-2022. Finally, oil price shocks tended to contribute significantly more to inflation variation in advanced economies; countries with stronger global trade and financial linkages; commodity importers; net energy importers; countries without inflation-targeting regimes; and countries with pegged exchange rate regimes. Our headline results are robust to a wide range of exercises—including alternative measures of global factors and oil prices—and aggregation of countries.

Keywords

Inflation, oil prices, global shock, domestic shock, FAVAR, exchange rates

JEL Classification

E31, E32, Q43

Address for correspondence:

(E) cama.admin@anu.edu.au

ISSN 2206-0332

Understanding the Global Drivers of Inflation:
How Important are Oil Prices?

Jongrim Ha, M. Ayhan Kose, Franziska Ohnsorge and Hakan Yilmazkuday[1]

January 2023

Abstract: This paper examines the global drivers of inflation in 55 countries over the 1970–2022 period. We estimate a Factor-Augmented Vector Autoregression model for each country and assess the importance of several global (demand, supply, and oil price) and domestic shocks. We report three main results. First, global shocks have explained about 26 percent of inflation variation in a typical economy. Oil price shocks accounted for only about 4 percent of inflation variation, but they had a statistically significant impact on inflation in three quarters of countries. Second, global shocks have become more important in driving inflation variation over time. The share of inflation variance caused by oil price shocks increased from 4 percent prior to 2000 to roughly 9 percent over the 2001–2022 period. They also accounted for some of the steep runup in inflation between mid-2021 and mid-2022. Finally, oil price shocks tended to contribute significantly more to inflation variation in advanced economies; countries with stronger global trade and financial linkages; commodity importers; net energy importers; countries without inflation-targeting regimes; and countries with pegged exchange rate regimes. Our headline results are robust to a wide range of exercises—including alternative measures of global factors and oil prices— and aggregation of countries.

Statistically Keywords: Inflation; oil prices; global shock; domestic shock; FAVAR; exchange rates.
JEL Classification: E31, E32, Q43

* Ha: World Bank, Prospects Group; jongrimha@worldbank.org. Kose: World Bank, Prospects Group; Brookings Institution; CEPR, and CAMA; akose@worldbank.org. Ohnsorge: World Bank, Prospects Group; CEPR; CAMA; fohnsorge@worldbank.org. Yilmazkuday: Florida International University; hyilmazk@fiu.edu. We would like to thank Zidong An, Carlos Arteta, Menzie Chinn, Kevin Clinton, Zolt Darvas, Alistair Dieppe, Laurent Ferrara, Graham Hacche, David Hendry, Gene Kindberg-Hanlon, Wee Chian Koh, Catherine Kyrtsou, David Papell, Xuguang Simon Sheng, Koji Takahashi, Christopher Towe, Kozo Ueda, Lei Sandy Ye, Kamil Yilmaz, and several seminar and conference participants for their helpful comments on earlier versions of this paper. Heqing Zhao provided excellent research assistance. We gratefully acknowledge support from World Bank PHRD and KCP Funds. The findings, interpretations and conclusions expressed in this paper are those of the authors and should not be attributed to the World Bank, its Executive Directors, or the countries they represent.

I. Introduction

Changes in inflation often have been associated with fluctuations in global output and oil prices. For example, between the early 1970s and the mid-1990s, inflation rose in many advanced economies and emerging market and developing economies (EMDEs) because of jumps in oil prices, sharp movements in output, and and/or financial crises—including debt and currency crises. Conversely, declines in inflation in advanced economies and EMDEs were associated with short-lived oil price plunges in the mid-1980s and the early 1990s.

Recent developments have renewed interest in the links between oil prices and inflation. After tumbling in the early months of the COVID-19 pandemic, inflation has been climbing in many countries since the middle of 2020. The highly synchronized increase in inflation appeared to be driven by a sharp rebound in demand that followed the reopening in many countries, persistent disruptions in global supply chains, and highly volatile fluctuations in oil and food prices. Since the Russian invasion of Ukraine in February 2022, global factors, including oil prices, have become more pronounced drivers of inflation.

Against this background, we examine the roles of global drivers of inflation—including global supply, global demand, and oil price shocks—in a large sample of advanced economies and EMDEs over 1970–2022. Specifically, we address three questions. First, what have been the global drivers of inflation over the past half century? Second, how have the roles of oil price and other global shocks changed over time? Third, how does the importance of oil price shocks depend on country characteristics?

Our paper presents the first comprehensive analysis of the roles of the global drivers of inflation for a large panel of countries over a long period. It makes three specific contributions to the literature.

First, to our knowledge, ours is the first study to examine the global sources of variation in inflation in a unified framework. We estimate a series of country-specific factor-augmented vector autoregression (FAVAR) models to quantify the roles of multiple global and domestic shocks in driving inflation. We identify these shocks using sign restrictions that are motivated by theory. Our inclusion of both global and domestic disturbances provides a rich of menu of shocks, which allows us to conduct a comprehensive study of the importance of oil-price shocks in the presence of other well-known drivers of inflation.

Second, our study is the first to employ data for a large and globally diverse sample of 55 countries, including 29 advanced economies and 26 EMDEs. The large country sample helps us to identify the links between certain country characteristics and the importance of oil prices shocks in driving inflation variation.

Finally, we analyze the longest quarterly data sample available over the 1970–2022 period for our county panel. Our use of a long time series allows us to consider the behavior of inflation and the roles played by different types of global shocks during multiple global recessions (1975, 1982, 1991, 2009, and 2020), periods of volatility in oil markets, and the post-pandemic period.

Some earlier studies have also considered the roles played by various global and domestic shocks in driving inflation fluctuations. For example, Charnavoki and Dolado (2014) analyze the impact of global demand, global supply, and commodity prices on Canadian prices (among other domestic variables) using a FAVAR model, in which shocks are identified by sign restrictions (as in this paper). They report that both global demand and commodity price shocks affect Canadian prices. In a recent study, Finck and Tillmann (2022) estimate SVAR models to study the importance of global and domestic shocks in driving inflation in six emerging market economies in Asia. They report that such shocks account for a sizable share of inflation variance.[2]

We report three major findings. First, global shocks—associated with demand, supply, and oil prices—accounted for nearly 26 percent of inflation variation in the median country over the 1970–2022 period. Demand shocks (about 18 percent) and oil price shocks (4 percent) together explained the lion's share of inflation variance caused by the global shocks. Although the role of oil price shocks in explaining inflation variation appears to be small in a typical country, such shocks have a statistically significant effect on inflation movements in three quarters of the countries. A positive one-standard-deviation oil price shock (close to the size of the positive oil price shock of early 2022 during the Russian invasion of Ukraine) is associated with 1.2 percentage point increase in the inflation rate in the median country after two years. The contribution of global demand and oil price shocks to inflation variance is typically much larger in advanced economies than in EMDEs.

The role of global shocks (especially global demand and oil price shocks) was more prominent in explaining changes in inflation during global recessions and periods of significant disturbances in oil markets. For example, oil price shocks contributed roughly 3.4 percentage points to the 7 percentage-point increase in year-on-year inflation, on average, between the third quarter of 1973 and the first quarter of 1974. Even in the most recent run-up in inflation, between the second quarter of 2021 and the second quarter of 2022, oil prices accounted for about one-tenth of the increase in inflation.

Second, the role of global shocks has grown over time: over the past two decades, global shocks were responsible for roughly 36 percent of inflation variation, compared to about 20 percent prior to 2000. The importance of oil price shocks has also risen from 4 percent (before 2000) to nearly 9 percent (since 2001). To a large extent, these findings may reflect the larger effect on inflation of global demand and oil price shocks, driven by the global recessions in 2009 and 2020, and multiple periods of significant volatility in global oil markets.

Third, the importance of oil price shocks in explaining inflation variation depended on country characteristics. For example, the share of inflation variance from oil price shocks tended to be statistically significantly larger for economies with stronger international trade and financial

[2] In related work, Eickmeier and Kühnlenz (2018) employ a FAVAR model to examine the effects on inflation in 38 countries of supply and demand shocks that originate in China. They find that the shocks on average account for about 6 percent of inflation variation. An earlier study by Bianchi and Civelli (2015) uses a time-varying VAR analysis to compare the effects of global slack and domestic slack on country-specific inflation rates. They find that the effects of global slack on inflation are stable over time, but they increase across countries as the degree of trade and financial openness rises.

linkages. Oil price shocks also played a significantly more important role in commodity (or net oil) importers. They drove a statistically significantly larger share of inflation variance in countries without inflation-targeting monetary policy frameworks, with pegged exchange rate regimes, and with a larger stock of public debt.

The rest of the paper is organized as follows. Section II presents our model, identification strategy and database. In Section III, we discuss the roles of global shocks in driving inflation variation using variance decompositions and impulse responses. In Section IV, we assess the links between the importance of oil price shocks in driving inflation and key country characteristics. Section V analyzes how global shocks affect the level of inflation, based on historical decompositions of estimated impulse response functions. In Section VI, we conduct a series of exercises to study the robustness of our headline findings. Section VII concludes with a summary of results and future research directions.

II. Methodology and Database

We estimate country-specific FAVAR models with three global variables—global inflation, global output growth, and global oil price growth—and four domestic variables—domestic inflation, domestic output growth, domestic interest rates, and nominal effective exchange rates. The first two global variables are proxied by common components across countries. Each of these is estimated using a single-factor dynamic factor model. The oil price is the average price of three major oil price benchmarks.

Our main variable of interest is domestic inflation. The model specification here is similar to earlier work by Forbes, Hjortsoe, and Nenova (2018, 2020) and Conti, Neri, and Nobili (2015)—which also include multiple domestic variables. However, it deviates from these studies because we also consider the effects of global supply, global demand and oil price shocks (on domestic inflation) in a unified setup. All the variables are seasonally adjusted quarterly growth rates (except interest rates) over the period 1970Q2–2022Q2.

II.1. FAVAR model

In its structural form, the following FAVAR model is employed:

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

where Z_t consists of global output growth ($f_t^{y,global}$), oil price growth (op), global inflation ($f_t^{\pi,global}$), domestic inflation ($\pi^{domestic}$), nominal effective exchange rate appreciation (XR), domestic output growth ($Y^{domestic}$), and domestic nominal short-term interest rates ($interest$).

The vector ε_t includes the following global shocks: a shock to the global demand of goods and services ("*global demand shock*"); a shock to oil prices ("*oil price shock*"); and a shock to the global supply of goods and services ("*global supply shock*"). It also includes the following domestic shocks to: (i) the domestic supply of goods and services ("*domestic supply shock*"); (ii) the nominal effective exchange rate ("*exchange rate shock*"); (iii) the domestic demand of goods and services ("*domestic demand shock*"); and (iv) domestic monetary policy ("*monetary policy*"). Employing this rich menu of global and domestic shocks, we are able to provide a comprehensive analysis of how global shocks drive domestic inflation.

The model is estimated with two lags (identified as optimal lag length according to the SIC and AIC criteria). For each country model, the Bayesian estimation searches for 1,000 successful draws of at least 2,000 iterations with 1,000 burn-ins. In the estimation, the Minnesota priors proposed by Litterman (1986) are used. The results presented here—for instance, impulse response functions—are based on the median (50th percentile) of these 1,000 successful draws and 68 percent confidence intervals at the country level. In reporting aggregated results of the forecast error variance decompositions, we use medians across countries, but we also report the simple average and GDP-weighted averages to test the robustness of our findings in Section VI.

II.2. Identification of shocks

We identify the shocks using sign restrictions as in studies by Charnavoki and Dolado (2014) and Forbes et al. (2018, 2020). 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 restrictions that are imposed over the first two quarters can be written as follows:

$$\begin{bmatrix} u_t^{Y,global} \\ u_t^{op} \\ u_t^{\pi,global} \\ u_t^{\pi,domestic} \\ u_t^{XR} \\ u_t^{Y,domestic} \\ u_t^{interest} \end{bmatrix} = \begin{bmatrix} + & - & + & 0 & 0 & 0 & 0 \\ + & + & + & 0 & 0 & 0 & 0 \\ + & + & - & 0 & 0 & 0 & 0 \\ * & * & * & - & * & + & - \\ * & * & * & * & + & * & + \\ * & * & * & + & * & + & - \\ * & * & * & * & * & + & + \end{bmatrix} \begin{bmatrix} \varepsilon_t^{GlobalDemand} \\ \varepsilon_t^{OilPrice} \\ \varepsilon_t^{GlobalSupply} \\ \varepsilon_t^{DomesticSupply} \\ \varepsilon_t^{ExchangeRate} \\ \varepsilon_t^{DomesticDemand} \\ \varepsilon_t^{MonetaryPolicy} \end{bmatrix}$$

where * stands for an unrestricted initial response. While domestic shocks do not affect global variables contemporaneously, global shocks can affect domestic variables (without any sign or zero restrictions). These sign restrictions, which are used to identify the structural shocks, are consistent with theoretical predictions (Fry and Pagan 2011).

We next briefly discuss the motivation behind our assumed sign restrictions. Regarding the identification of *global* shocks: a positive global supply shock (hereafter "*global supply shock*") is assumed to raise global output and oil price growth but to reduce global inflation. A positive *global demand shock* is assumed to increase global output growth, global inflation, and oil price growth. Our identification assumptions with respect to the global supply and demand shocks are consistent with the earlier literature. A positive *oil price shock* is assumed to raise oil prices and global inflation but to lower global output growth. This set of identification assumptions on oil price shocks also closely follows some earlier studies—such as those by Melolinna (2015), Charnavoki and Dolado (2014), and Ferroni and Mojon (2014)—which presume that a positive cost (commodity price) shock reduces output and raises commodity prices and inflation.

We also closely follow the earlier literature in our assumptions with respect to the identification of *domestic* shocks: A positive *domestic supply shock* raises domestic output growth but reduces inflation. A positive *domestic demand shock* is assumed to raise domestic output growth, inflation, and domestic interest rates. These sign restrictions are in line with the sign restrictions employed by Gambetti, Pappa, and Canova (2005) and Forbes, Hjoertsoe, and Nenova (2018). A contractionary (positive) *monetary policy shock* triggers nominal effective appreciation, lowers output growth, and lowers inflation. Finally, the impact of a positive *exchange rate shock* (corresponding to an appreciation of the domestic currency) is assumed to increase the exchange rate, while its impact on other domestic variables is left unrestricted.

II.3. Database

Our country sample includes 29 advanced economies and 26 EMDEs with at least 10 years (40 quarters) of continuous data for the variables in the domestic block, although the sample period differs across countries. The full sample covers the period from 1970Q2 to 2022Q2. The list of countries and sample periods are presented in Table A1 of the Appendix.

Global output growth is the estimated global factor of quarter-on-quarter, seasonally adjusted real gross domestic product (GDP) growth of all countries in our sample. *Global inflation* is also the estimated global factor of quarter-on-quarter, seasonally adjusted headline consumer price index (CPI) inflation of the same country sample. To allow the country-specific FAVAR estimations to cover data as far back in time as possible, the global factors for output growth and inflation are estimated using country samples with available data for the full sample period 1970Q22022Q2.[3] Formally, global inflation and global output growth are estimated by the following two dynamic factor models:

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

where π_t^i and Y_t^i inflation and output growth in country *i* at quarter *t*, respectively, while $f_t^{\pi,global}$ *and* $f_t^{Y,global}$ are the global common factors for inflation and output growth at quarter *t*, respectively.[4] *Oil price growth* is the quarter-on-quarter growth rate of the nominal oil price (the

[3] This restricts the sample to 29 countries for global output growth and 47 countries for global inflation (which accounted for 60 percent of global GDP in 2021). For about half of the country sample, the FAVAR estimation only starts in the 1990s.

[4] The main assumptions in the estimation of the global factors follow those in Kose, Otrok, and Prasad (2012). The model is specified in terms of growth because the variable of interest (inflation) is itself a growth rate.

simple average of Dubai, West Texas Intermediate, and Brent benchmarks), as reported by the World Bank's monthly *Pink Sheet*.

Domestic output growth is quarter-on-quarter, seasonally adjusted real GDP growth, as reported by Haver Analytics and the World Bank's *World Development Indicators*. *Domestic inflation* is quarter-on-quarter, seasonally adjusted headline CPI inflation, as reported in the World Bank's *Global Database of Inflation* (Ha, Kose, and Ohnsorge 2022). *Domestic interest rates* are quarter-on-quarter differences in three-month Treasury bill rates or monetary policy rates, as reported by Haver Analytics, the *Federal Reserve Economic Data* (FRED) database, and the OECD's database. The *Nominal effective exchange rate* is the quarter-on-quarter change in trade-weighted nominal exchange rates, as reported by Haver Analytics and the IMF's *International Financial Statistics*.[5]

III. Role of global shocks

III.1. Contributions of global shocks: Variance decompositions

Contributions of global shocks. Over the full sample period, global shocks accounted for nearly 26 percent of domestic inflation variance in the median country (see Table 1A). Domestic shocks explained the rest of the inflation variance. For the remainder of this paper, we focus our discussion on global shocks, the main interest of this study.[6]

Global demand shocks and oil price shocks were the main drivers of inflation in the average country, accounting for 18 and 4 percent of inflation variance, respectively, during 1970–2022. This finding is broadly consistent with earlier results reported by a few other studies (Conti, Neri, and Nobili 2015; Parker 2018). The relatively large role of global demand shocks (along with oil price shocks) in part reflected the major inflation swings around global recessions (Ha, Kose, and Ohnsorge 2021a and 2022) and around disruptive movements in oil markets in almost every decade in the last half century.

Contributions across countries. The contribution of global shocks to inflation variation was, on average, considerably larger in advanced economies (35 percent) than in EMDEs (19 percent). Global demand shocks typically accounted for 25 percent of inflation variation in advanced economies and 14 percent in EMDEs. The importance of oil price shocks in driving inflation variance in advanced economies, at 6 percent, was also twice that of the 3 percent in EMDEs.

These findings likely reflect the greater homogeneity of advanced economies than of EMDEs and could be caused by a wide range of features advanced economies share—such as stronger global trade and financial linkages, deeper integration into global supply chains, and similar monetary policy regimes (see Table 1A). The similarity of monetary policy regimes, is, for example, also reflected in considerably more homogeneous inflation expectations in advanced economies than

[5] Long-term components of quarterly growth rates are eliminated by using 15-year moving averages, following Stock and Watson (2012). The results are qualitatively robust to different detrending methods (for example, the Hodrick-Prescott or Butterworth filters). These robustness results are available upon request.

[6] Detailed results on the importance of domestic shocks are available upon request from the authors.

in EMDEs. By comparison, EMDEs constitute a more heterogeneous group of countries where inflation is often more responsive to domestic factors (Cárdenas et al., 2011; Halka and Kotlowski, 2017; Osorio and Unsal, 2013).

Contributions over time. Over the three subperiods we examine (1970–85, 1986–2000, and 2001–22), the contribution of global shocks to inflation variation has grown significantly, especially since 2001 (to 36 percent for the median country), and in all country groups (to more than one-half in advanced economies and about one-quarter in EMDEs). The larger contribution in the later period could be the result of considerably larger global demand and oil price shocks in the last subperiod (see Tables 1, Parts B and C). Specifically, the contribution of global demand shocks has increased from 11 percent in the first subperiod to 25 percent during the last subperiod, and that of oil price shocks has also risen, from 4 percent (in 1986–2000) to nearly 9 percent (in 2001–22). To a large extent, this may reflect the effect on inflation of global demand shocks driven by the global recessions in 2009 and 2020. The last subperiod has also had significant volatility in oil prices in 2007–09, 2014–16, and again in 2020–22 (Baffes et al. 2015; Nguyen et al. 2017; Ha, Kose and Ohnsorge 2022).

In contrast, the importance of global supply shocks has declined over time—from 5 percent during 1970–85 to less than 2 percent for the median country after 2001. A large number of countries were afflicted by waves of financial crises in the 1970s, 1980s, and 1990s—when steep inflation surges were accompanied by plunging output, a phenomenon we captured as supply shocks in our framework here. By comparison, the 2000s were a period a relative calm in EMDEs, notwithstanding the global financial crisis that began in 2008 (Kose et al. 2021).

III.2. Impact of global shocks: Impulse responses

Overall impact. The estimated impulse responses suggest that global shocks had a significant impact on inflation. For the full sample, over two years, impulse responses to global demand and oil price shocks were statistically significant for more than 70 percent of countries and to global supply shocks for more than 60 percent countries (see Figure 1). For all three global shocks, the share of countries with statistically significant impulse responses was larger for the group of advanced economies than for the group of EMDEs.

A more detailed analysis of impulse responses confirms these initial observations. For example, a positive one-standard-deviation global demand shock (about one-third the size of the average negative demand shock of 2008–09) was associated with 0.8 percentage-point higher inflation in the median country (50th percentile) within a quarter and, cumulatively, with about 2.4 percentage-point higher inflation after two years (see Table 2, Part A and Figure 2). A negative one-standard-deviation global supply shock was followed by 0.3 percentage-point higher inflation within a quarter and, cumulatively, 0.7 percentage-point higher inflation after two years. Finally, a positive one-standard-deviation oil price shock (close to the size of the positive oil price shock of early 2022, during the Russian invasion of Ukraine) was associated with 0.3 percentage-point higher inflation in the median country within a quarter that built up to, cumulatively, around 1.2 percentage points after two years.

Impact across country groups. For the median country, the effect of global shocks on inflation was broadly similar in EMDEs and advanced economies (see Table 2, Part B). Inflation in the median country was 2.6 percentage points higher in advanced economies and 2.5 percentage points higher in EMDEs two years after a positive one-standard-deviation global demand shock. A negative one-standard-deviation global supply shock resulted in a somewhat larger increase in inflation in the median advanced economy (0.9 percentage point) than in the median EMDE (0.6 percentage point), but the estimated interquartile ranges overlap. A positive one-standard-deviation oil price shock was also associated with a somewhat larger increase in inflation in the median advanced economy (1.3 percentage point) than in the median EMDE (0.9 percentage point) but, again, the interquartile ranges overlap.[7]

Impact over time. The impulse responses of inflation to oil price and global demand shocks during 2001–22 were comparable to those during 1970–85 but larger than those during 1986–2000. In part, this reflected the larger movements in oil prices in the mid-1970s, early 1980s, mid-2000s, and most recently 2020–22. Finally, the cumulative responses to global supply shocks were larger during 1970–85 than in later subperiods, possibly reflecting significant improvements in the overall flexibility of economies and monetary policy frameworks that facilitated faster adjustments to shocks. This result is consistent with the declining role of global supply shocks based on the variance decompositions of inflation in Section II.

IV. Role of oil price shocks: Country characteristics

We now examine how the importance of oil price shocks in explaining inflation volatility varied, depending on a few key country characteristics (see Table A2 of the Appendix). Specifically, we study two types of country characteristics—one based on the nature of international linkages (see Table 3) and the other based on the nature of domestic policies (see Table 4). International linkages that we consider are commodity importer/exporter status, net oil exporter/importer status, and the extent of financial and trade openness. For domestic policies, we examine different types of monetary policy frameworks and exchange rate regimes, and the level of public debt. We formally test the significance of differences across country subgroups in the context of each country characteristic.

IV.1. International linkages

Trade integration is a critical factor that could transmit oil price shocks to domestic prices. Our findings portray a consistent and intuitively appealing link between trade integration and the importance of oil price shocks in explaining inflation. Specifically, for all measures of trade integration we employ, the share of inflation variance attributable to oil price shocks tends to be larger for more integrated economies. For example, in EMDEs with a higher degree of trade openness, as measured by the trade-to-GDP ratio, the inflation variance from oil price shocks was more than twice that in EMDEs with a lower degree of trade openness (see Table 3). In EMDEs with

[7] Using a local projection model based on a panel of 72 countries, Choi et al. (2018) find similar point estimates for the effects of oil price shocks on inflation in advanced economies and EMDEs.

a higher degree of participation in global value chains, oil price shocks contributed almost three times as much to inflation movements as they did in EMDEs with less participation. In several cases we examine (both full sample and group subsamples), the difference in the importance of oil price shocks in explaining inflation variation between more integrated and less integrated economies was statistically significant.

These findings are consistent with some earlier studies. Bianchi and Civelli (2015) report that the impulse responses of inflation to global slack are larger in countries that are more open to trade. Similarly, a theoretical model developed by Martínez-Garcia and Wynne (2010) predicts that inflation is less responsive to domestic slack in countries that are more open to trade. Andrews, Gal, and Witheridge (2018) document that a high level of global value chain integration can strengthen the transmission of global shocks by accentuating the effect of global economic slack on domestic inflation.

We also examine the role of oil price shocks in countries with different degrees of dependence on commodity and energy imports. The contribution of oil price shocks to inflation variation tended to be statistically significantly larger for commodity and net energy importers than for the full sample. This finding is also consistent with earlier studies—such as by Salisu et al. (2017)—which report that oil prices exert a greater impact on inflation in net oil importers than in oil exporters. For advanced economies, this difference was more pronounced: among advanced economies, the importance of oil price shocks in driving inflation in commodity importers was more than three times that in commodity exporters. Similarly, in EMDEs, the contribution of oil price shocks to inflation variation in net energy importers was more than twice that in net energy exporters. The larger role of oil price shocks in commodity and net energy importers is likely the result of the compounded effect of oil price movements through currency fluctuations on inflation.

Our results with respect to *financial integration* are similar to those from trade integration in the sense that oil price shocks tended to play a larger role in explaining inflation variation in more financially integrated economies than in less integrated ones. This result held irrespective of the financial integration measure used, and in many cases (full sample and group subsamples), the differences between more and less financially integrated economies were statistically significant. For example, in advanced economies with larger international assets and liabilities relative to GDP, the share of inflation variance from oil shocks tended to be twice that in less integrated economies. This is consistent with other studies—such as by Urom et al. (2021)—that find that financially integrated countries are more affected by monetary policies of their financial partners reacting to changes in oil prices than are less financially integrated economies.

IV.2. Domestic policies

Oil price shocks tended to play a smaller role in explaining inflation variation in countries with inflation-targeting monetary policy frameworks than in those that did not target inflation. The difference was statistically significant for the full sample of countries and subsamples (see Table 4). This finding is broadly consistent with earlier studies—such as by Chen (2009)—which find that oil price shocks have a smaller effect on inflation when central banks react to higher oil prices by increasing their policy rates. Other characteristics of central banks, such as central bank independence and the number of changes in central bank leadership, either did not translate into statistically significant differences with respect to the role of oil price shocks or did so only when the full sample was considered.

We also analyze the role of an exchange rate regime in explaining the importance of oil price shocks. Irrespective of the country sample and the measure of exchange rate regime employed, the importance of oil price shocks in explaining inflation variation tended to be statistically significantly larger in countries with pegged exchange rate regimes than that in countries with flexible regimes. This result implies that oil price shocks are passed through into inflation to a lesser extent when exchange rates are allowed to adjust to market forces. Finally, oil price shocks explained a larger share of inflation variance in countries with bigger stocks of government debt than in those with smaller ones. However, this difference was statistically significant only for the full sample.

V. Global shocks and inflation fluctuations

After analyzing the role of global shocks in driving the volatility of inflation, we now turn to an analysis of the importance of global shocks in explaining the level of inflation. For this purpose, we compute the historical contributions of global shocks (demand, supply, and oil price) and domestic shocks to inflation using the impulse response functions estimated in the previous section (see Figure 3). We focus on the cross-country averages of these contributions and report results for the full-sample period (see Figure 3, Panel A, 1970–2022) as well as the last subperiod (see Figure 3, Panel B, 2001–22), which includes the 2009 and 2020 global recessions.

Consistent with the results of variance decompositions of inflation discussed in Section III, domestic shocks (gray-colored) explain the bulk of fluctuations in inflation during most of the full sample period (see Figure 3, Panel A). However, during global recessions and periods coinciding with major movements in oil prices, the importance of global shocks—in particular, global demand and oil price shocks--rises. For example, global demand shocks (blue-colored) play a significant role in explaining movements in inflation (both its rise and fall) during the global recessions of 1975, 1982, and 1991. These shocks became more important in explaining inflation movements during the 2009 and 2020 global recessions.

Oil price shocks (red-colored bars) play an important role during the two oil crises (1973–4 and 1979). For example, oil price shocks contributed about one-half of the 7 percentage-point increase in year-on-year inflation, on average, between the third quarter of 1973 and the first quarter of 1974. They accounted for about a quarter of the 5.4 percentage-point increase in inflation during 2007–08. Similarly, when oil prices plunged between mid-2014 and January 2016, they again played a sizable role in the decline in inflation, explaining about half of the 1.3 percentage-point decline in year-on-year inflation, on average, between the second quarter of 2014 and the first quarter of 2016. Although the role of global supply shocks (orange-colored bars) was smaller than that of global demand and oil price shocks, they did play a role during a few episodes— including the disruptions that followed the oil price spikes in the 1970s and in global recessions.

Global demand shocks have been the main force triggering the collapse of inflation in the first half of 2020. They fully accounted for the decline in year-on-year inflation, on average, between the fourth quarter of 2019 and the second quarter of 2020. These demand shocks began to unwind in the second half of 2020, on the back of a strong demand rebound from the global recession, a recovery that was in part fueled by substantial policy support. Price increases were particularly large in sectors in which pent-up demand picked up after the reopening from the pandemic while capacity constraints and supply chain disruptions persisted.

Since the second half of 2021, and in particular following the Russian invasion of Ukraine in early 2022, the drivers of inflation pressures have broadened. Global demand shocks, in part reflecting the release of pent-up demand, accounted for about a fourth of the 6.5 percentage-point increase in year-on-year inflation, on average, between the second quarter of 2021 and the second quarter of 2022; global supply shocks, such as shipping bottlenecks and wage pressures in some countries, accounted for a fifth of the increase; the rebound in global oil prices for a tenth. These findings are broadly consistent with empirical results reported by di Giovanni et al. (2022), Shapiro (2022), and Ha, Kose, and Ohnsorge (2022).

VI. Robustness exercises

In this section, we present a set of exercises to check the robustness of our headline results: (i) using real oil prices and nominal energy prices as alternatives to nominal oil prices; (ii) using alternative measures of global output growth and global inflation; and (iii) presenting variance compositions based on the simple averages and weighted averages across countries (as an alternative to using medians). The results from these exercises are broadly in line with our headline results (see Table 5).

VI.1. Oil prices

Our baseline exercises employ growth of nominal oil prices. We replace them here with two alternative price series: (i) growth of real oil prices, and (ii) growth of nominal energy prices.[8] The corresponding measures are depicted in Figure 4, where they are shown to be very similar. In the baseline exercise, oil price shocks account for about 4 percent of inflation variance. When the alternative measures are used in estimations, the share is around 6 percent.

VI.2. Global output growth and global inflation

We proxied global output growth and global inflation with common global factors in our baseline exercises. Alternatively, they can be based on the: (i) median of, and (ii) weighted average across countries. These alternative measures move closely with our global factor estimates (see Figure 4). While these new measures do not affect the relative importance of global supply and oil price shocks in explaining inflation variance, they translate into a somewhat larger role for global

[8] Nominal oil and energy prices are based on the series from the World Bank's Pink Sheet data. Real oil prices are obtained by deflating nominal oil prices with the U.S. Consumer Price Index. The nominal energy price is an index that includes crude oil prices, natural gas prices, and coal prices.

demand shocks. Nevertheless, the difference of this larger role (with respect to the baseline results) is not statistically significant.

VI.3. Aggregation methods

We used medians of variance shares across countries when we reported our baseline results. Instead, we now compute the simple averages and GDP-weighted averages of variance shares. Our baseline variance decompositions of inflation are robust to these alternative aggregations. We also check how the baseline results for country groups and subperiods change when we introduce alternative aggregation methods. While the specific magnitudes change, the main trends are consistent with our baseline results. First, global shocks tend to have a more important role in advanced economies than in EMDEs. Second, the role of global demand shocks has more than doubled between the first and third subperiods while the role of global supply shocks has more than halved and the role of oil price shocks has risen slightly.

VII. Conclusion

Recent developments have renewed interest in the role of global factors in driving the rapid surge in inflation. In this paper, we systematically explored the roles played by a rich menu of global and domestic shocks in explaining inflation fluctuations using a FAVAR model applied to 55 countries over the 1970–2022 period. We paid special attention to oil price shocks because gyrations in oil markets have become increasingly more prominent in driving inflation since the beginning of the COVID-19 pandemic.

Our results indicate that global shocks play an important role in driving inflation. These shocks explain nearly 26 percent of inflation variation in a typical economy. Oil price shocks account for 4 percent of inflation variance, but they have a significant impact on inflation movements in three quarters of countries. The importance of oil price shocks has increased over time. These shocks are significantly more important in driving inflation variation in: advanced economies, countries with stronger global trade and financial linkages, commodity importers; net energy importers, countries without inflation targeting regimes, and countries with pegged exchange rates. We conduct a variety of additional exercises and document that our baseline results are robust to variations in global factors, oil prices, and aggregation methodologies.

Our findings suggest several topics for future research. First, we document that oil price shocks tend to be less important in driving inflation in countries that target inflation. This is an intuitively attractive observation that suggests that these central banks mainly focus on the inflationary impact of demand and supply shocks rather than on commodity price shocks, which tend to have relatively smaller and less persistent effects on core inflation. It would be useful to analyze the role of oil price shocks in driving inflation in a dynamic stochastic model that allows a central bank to employ different types of monetary policy frameworks. This type of model could strengthen the intuition behind the observation we document here. Second, because our study focused on global shocks, we did not analyze the role of domestic shocks. We plan to explore the importance of these shocks in a subsequent study.

References

Abbas, A.S.M., Belhocine, N., El-Ganainy, A. and Horton, M., 2011. "Historical patterns and dynamics of public debt—evidence from a new database." *IMF Economic Review*, 59(4), pp.717-742.

Andrews, D., P. Gal, and W. Witheridge. 2018. "A Genie in a Bottle? Globalisation, Competition and Inflation." OECD Working Paper 1462, Organisation for Economic Co-operation and Development, Paris.

Baffes, J., M. A. Kose, F. Ohnsorge, and M. Stocker. 2015. "The Great Plunge in Oil Prices—Causes, Consequences, and Policy Responses." Policy Research Note 1, World Bank, Washington, DC.

Bianchi, F. and Civelli, A., 2015. "Globalization and inflation: Evidence from a time-varying VAR." *Review of Economic Dynamics*, 18(2), pp.406-433.

Carare, A. and Stone, M.R., 2006. "Inflation targeting regimes." European Economic Review, 50(5), pp.1297-1315.

Cárdenas, M., Foda, K., Henao, C. and Levy-Yeyati, E., 2011. *Latin America Economic Perspectives: Shifting Gears in an age of heightened expectations.* Brookings, Washington DC.

Carriere-Swallow, M. Y., M. P. Deb, D. Furceri, D. Jimenez, and M. J. D. Ostry. 2022. "Shipping Costs and Inflation." IMF Working Paper 17259. International Monetary Fund. Washington, DC.

Charnavoki, V. and Dolado, J.J., 2014. "The effects of global shocks on small commodity-exporting economies: lessons from Canada." *American Economic Journal: Macroeconomics*, 6(2), pp.207-37.

Chen, S.S., 2009. "Oil price pass-through into inflation." *Energy Economics*, 31(1), pp.126-133.

Chinn, M.D. and Ito, H., 2006. "What matters for financial development? Capital controls, institutions, and interactions." *Journal of Development Economics*, 81(1), pp.163-192.

Conti, A. M., S. Neri, and A. Nobili. 2015. "Why Is Inflation So Low in the Euro Area?" Economic Working Papers 1019, Bank of Italy, Rome.

Di Giovanni, J., S. Kalemli-Özcan, A. Silva, and M. A. Yildirim. 2022. "Global Supply Chain Pressures, International Trade, and Inflation," NBER working paper w30240, National Bureau of Economic Research, Cambridge, Massachusetts.

Dincer, N.N. and Eichengreen, B., 2014. "Central Bank Transparency and Independence: Updates and New Measures." *International Journal of Central Banking*, 10(1), pp.189-259.

Dreher, A., Sturm, J.E. and De Haan, J., 2010. "When is a central bank governor replaced? Evidence based on a new data set." *Journal of Macroeconomics*, 32(3), pp.766-781.

Eickmeier, S., and M. Kühnlenz. 2018. "China's Role in Global Inflation Dynamics." *Macroeconomic Dynamics* 22 (2): 225-54.

Fernández, A., Klein, M.W., Rebucci, A., Schindler, M. and Uribe, M., 2016. "Capital control measures: A new dataset.” *IMF Economic Review*, 64(3), pp.548-574.

Ferroni, F., and B. Mojon. 2014. “Domestic and Global Inflation.” Federal Reserve Bank of Cleveland, Ohio.

Finck, D. and Tillmann, P., 2022. “The role of global and domestic shocks for inflation dynamics: Evidence from Asia.” *Oxford Bulletin of Economics and Statistics*, forthcoming.

Forbes, K., Hjortsoe, I. and Nenova, T., 2018. “The Shocks Matter: Improving Our Estimates of Exchange Rate Pass- Through.” *Journal of International Economics* 114 (September): 255-75.

Forbes, K., Hjortsoe, I. and Nenova, T., 2020. “International evidence on shock-dependent exchange rate pass-through.” *IMF Economic Review*, 68(4), pp.721-763.

Fry, R., and A. Pagan. 2011. “Sign Restrictions in Structural Vector Autoregressions: A Critical Review.” *Journal of Economic Literature*, 49 (4): 938-60.

Gambetti, L., E. Pappa, and F. Canova. 2005. “The Structural Dynamics of U.S. Output and Inflation: What Explains the Changes?” Economics Working Papers 921, Department of Economics and Business, Universitat Pompeu Fabra, Barcelona.

Ha, J., Kose, M. A. and Ohnsorge, F. eds., 2019. “Inflation in emerging and developing economies: Evolution, drivers, and policies.” World Bank Publications, Washington, DC.

Ha, J., M. A. Kose, and F. Ohnsorge. 2021a. “Inflation During the Pandemic: What Happened? What is Next?” Working Paper 58/21, Center for Applied Macroeconomic Analysis, Canberra, Australia.

Ha, J., M. A. Kose, and F. Ohnsorge. 2021b. “One-stop source: A global database of inflation,” Policy Research Working Paper 9737, World Bank. Washington, DC.

Ha, J., M. A. Kose, and F. Ohnsorge. 2022. “Global Stagflation,” Discussion Paper 17381, Center for Economic Policy Research, London, UK.

Hałka, A. and Kotłowski, J., 2017. “Global or domestic? Which shocks drive inflation in European small open economies?” *Emerging Markets Finance and Trade*, 53(8), pp.1812-1835.

Ilzetzki, E., Reinhart, C.M. and Rogoff, K.S., 2019. “Exchange arrangements entering the twenty-first century: Which anchor will hold?” *The Quarterly Journal of Economics*, 134(2), pp.599-646.

Kose, M.A., Nagle, P., Ohnsorge, F. and Sugawara, N., 2021. “Global Waves of Debt: Causes and Consequences.” Washington, DC: World Bank.

Kose, M. A., C. Otrok, and E. Prasad. 2012. “Global Business Cycles: Convergence or Decoupling?” *International Economic Review* 53 (2): 511-38.

Lane, P.R. and Milesi-Ferretti, G.M., 2007. “The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004.” *Journal of international Economics*, 73(2), pp.223-250.

Litterman, R. B. 1986. “Forecasting with Bayesian Vector Autoregressions—Five Years of Experience.” *Journal of Business and Economic Statistics* 4 (1): 25-38.

Martínez-García, E., and M. Wynne. 2010. "The Global Slack Hypothesis." Staff Papers 10, Federal Reserve Bank of Dallas, Dallas, Texas.

Mauro, P., Romeu, R., Binder, A. and Zaman, A., 2015. "A modern history of fiscal prudence and profligacy." *Journal of Monetary Economics*, 76, pp.55-70.

Melolinna, M. 2015. "What Has Driven Inflation Dynamics in the Euro Area, the United Kingdom and the United States?" ECB Working Paper 1802, European Central Bank, Frankfurt am Main.

Nguyen, A. D. M., J. Dridi, F. D. Unsal, and O. H. Williams. 2017. "On the Drivers of Inflation in Sub-Saharan Africa." *International Economics* 151 (C): 71-84.

Osorio, C., and D. F. Unsal. 2013. "Inflation Dynamics in Asia: Causes, Changes, and Spillovers from China." *Journal of Asian Economics* 24 (February): 26-40.

Parker, M. 2018. "How Global Is 'Global Inflation'?" *Journal of Macroeconomics* 58 (December): 174-97.

Salisu, A.A., Isah, K.O., Oyewole, O.J. and Akanni, L.O., 2017. "Modelling oil price-inflation nexus: The role of asymmetries. *Energy*, 125, pp.97-106.

Shambaugh, J.C., 2004. "The effect of fixed exchange rates on monetary policy." *The Quarterly Journal of Economics*, 119(1), pp.301-352.

Shapiro, A. H. 2022. "How Much Do Supply and Demand Drive Inflation?" FRBSF Economic Letter, Federal reserve Bank of San Francisco, San Francisco, California.

Stock, J. H., and M. W. Watson. 2012. "Disentangling the Channels of the 2007-2009 Recession." NBER WP 18094, National Bureau of Economic Research, Cambridge, Massachusetts.

Urom, C., Guesmi, K., Abid, I. and Dagher, L., 2021. Dynamic integration and transmission channels among interest rates and oil price shocks. *The Quarterly Review of Economics and Finance*.

World Bank. 2018. *Global Economic Prospects: Broad-Based Upturn, but for How Long?* Washington, DC: World Bank.

Table 1. Contributions of global shocks to inflation

(percent of total variance)

A. By country groups

	All countries	Advanced economies	EMDEs
Total Global Shocks	25.5	34.7	19.4
Global Demand Shock	18.3	24.6	14.0
Global Supply Shock	2.8	4.0	2.3
Oil Price Shock	4.4	6.1	3.1
Total Domestic Shocks	74.5	65.3	80.6

B. Over time

	1970–1985	1986–2000	2001–2022
Total Global Shocks	20.7	18.6	35.6
Global Demand Shock	11.4	10.1	25.2
Global Supply Shock	5.1	4.4	1.7
Oil Price Shock	4.2	4.1	8.7
Total Domestic Shocks	79.3	81.4	64.4

C. By country groups over time

	1970–1985		1986–2000		2001–2022	
	Advanced	EMDEs	Advanced	EMDEs	Advanced	EMDEs
Total Global Shocks	20.7	-	22.0	10.1	57.1	24.4
Global Demand Shock	11.4	-	11.1	2.0	43.7	19.4
Global Supply Shock	5.1	-	4.3	6.8	2.6	1.5
Oil Price Shock	4.2	-	6.6	1.3	10.8	3.5
Total Domestic Shocks	79.3	-	78.0	89.9	42.9	75.6

Note: The table shows the median share of country-specific inflation variance accounted for by global shocks (global demand, global supply, oil prices) based on country-specific FAVAR models estimated for 29 advanced economies and 26 EMDEs over 1970–2022 (Part A), three subperiods (Part B). and country subgroups over three subperiods (Part C). Not enough data available to conduct the exercise for EMDEs over the 1970-1985 period.

Table 2. Impact of global shocks on domestic inflation

(percentage-point deviation)

A. Full sample (1970–2022)

	Global demand shock			Global supply shock			Oil price shock		
	25%	50%	75%	25%	50%	75%	25%	50%	75%
On impact	0.6	0.8	1.1	-0.5	-0.3	-0.2	0.3	0.3	0.5
1 year	1.3	2.1	3.0	-1.1	-0.7	-0.4	0.6	0.9	1.3
2 years	1.7	2.4	3.6	-1.3	-0.7	-0.5	0.6	1.2	1.7
3 years	1.7	2.6	3.8	-1.3	-0.8	-0.5	0.6	1.3	1.9

B. By country groups (1970–2022), after two years

	Global demand shock			Global supply shock			Oil price shock		
	25%	50%	75%	25%	50%	75%	25%	50%	75%
All countries	1.7	2.4	3.6	-1.3	-0.7	-0.5	0.6	1.2	1.7
Advanced economies	1.9	2.6	3.0	-1.2	-0.9	-0.5	0.9	1.3	1.8
EMDEs	1.4	2.5	4.6	-1.5	-0.6	-0.2	0.1	0.9	2.5

C. Over time, for all countries, after two years

	Global Demand Shock			Global Supply Shock			Oil Price Shock		
	25%	50%	75%	25%	50%	75%	25%	50%	75%
1970–1985	0.8	2.7	3.8	-2.0	-1.2	-0.2	0.7	1.2	2.2
1986–2000	0.2	0.7	1.1	-1.1	-0.5	0.1	0.3	0.5	0.8
2001–2022	1.7	2.4	3.7	-1.3	-0.6	-0.2	0.6	1.3	1.8

Note: The results are based on the country-specific FAVAR models for 55 countries. Cumulative impulse responses of inflation to three global shocks 2 years after the shock over the full sample period (B and C) or three subsamples © are presented. The median and inter-quantile ranges of country-specific results are presented.

Table 3. Contributions of oil price shocks to inflation by country groups: the role of international linkages
(percent of total variance)

Characteristics	Measures	Groups	All countries	Advanced economies	EMDEs
Trade openness	Trade-to-GDP	Low	4.4	5.6	3.0
		High	7.7***	7.7	7.5***
	Trade concentration	Low	9.4**	22.6	7.3
		High	9.4	6.2	4.8
	Tariff rates	Low	6.6	7.0	5.4
		High	5.1	4.8*	5.1
	GVC participation	Low	5.9	6.7	1.9
		High	6.1	6.7	5.6**
Commodity import	Commodity import	Import	6.8**	7.6**	5.4
		Export	4.1	2.3	5.0
	Net energy import	Import	6.4**	7.0	5.8*
		Export	2.6	3.1	2.4
Financial openness	International asset and liability	Low	5.2	4.2	3.8
		High	6.9	9.0***	6.7*
	Chinn-Ito Index	Low	5.7	5.2	3.2
		High	6.3	8.3*	7.2**
	Capital control	Low	7.1***	8.3*	7.2**
		High	3.6	5.2	3.2

Note: The table shows average share of country-specific inflation variance accounted for by oil price shocks based on country-specific FAVAR models estimated for 29 advanced economies and 26 EMDEs for 1970–2022. Countries with "high" trade and financial openness, central-bank independence, or public debt are defined as those with above-median corresponding measures; all others are considered "low." "Export" indicates commodity exporter or net energy exporter, and all others are classified as "importer." See Table A2 of the Appendix for more details on country characteristics. Stars indicate that the mean within a group is greater than the other group at significance level of 1 percent (***), 5 percent (**), or 10 percent (*).

Table 4. Contributions of oil price shocks to domestic inflation by country groups: the role of domestic policies
(percent of total variance)

Characteristics	Measures	Groups	All countries	Advanced economies	EMDEs
Monetary policy framework	Inflation target	Non-IT	8.8***	9.6***	7.6***
		IT	3.1	3.1	3.2
	Central bank independence	Low	6.5	7.1	5.2
		High	5.0	4.1	4.8
	Central bank turn-over	Low	5.6	6.2	6.4
		High	9.0*	22.1	4.8
Exchange rate regime	De-facto regime	Flexible	4.3	5.4	3.0
		Pegged	7.8***	8.1*	7.5**
	De-Jure regime	Flexible	3.7	5.0	2.4
		Pegged	8.2***	8.1*	8.1***
Debt level	Public debt	Low	4.9	6.2	5.2
		High	7.1*	7.3	5.3

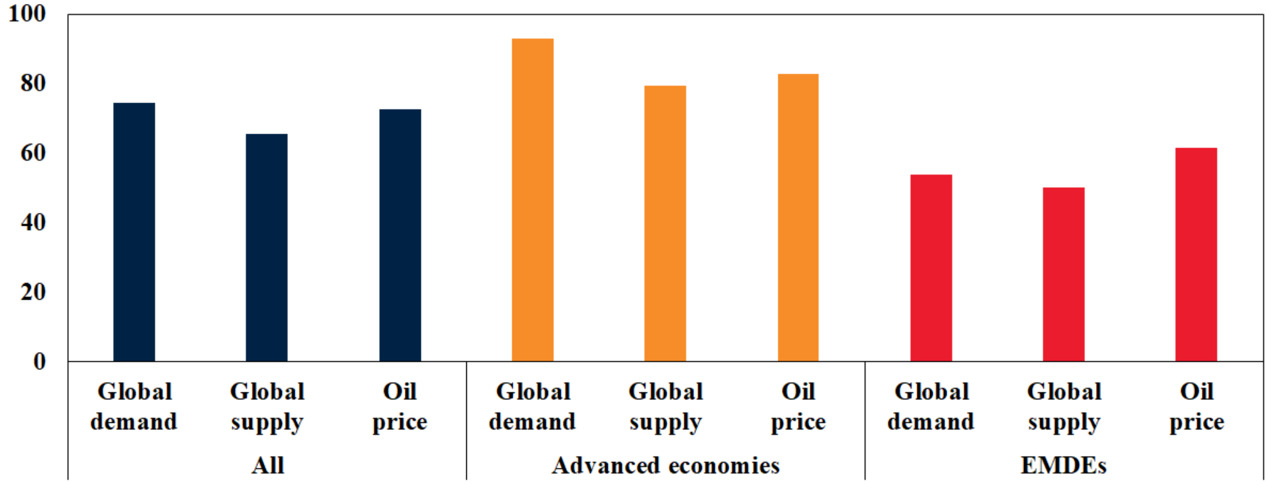
Note: The table shows the average share of country-specific inflation variance accounted for by oil price shocks based on country-specific FAVAR models estimated for 29 advanced economies and 26 EMDEs for 1970–2022. Countries with "high" trade and financial openness, central-bank independence, or public debt are those with above-median corresponding measures; all others are considered "low." "Export" indicates commodity exporter or net energy exporter, and all others are classified as "importer. "Flexible" and "Pegged" refer to countries with flexible exchange regime and pegged regimes, respectively. See Table A2 of the Appendix for more details on country characteristics. Stars indicate that the mean within a group is greater than the other group at significance level of 1 percent (***), 5 percent (**), and 10 percent (*).

Table 5. Contributions of shocks to inflation: Robustness exercises
(percent of total variance)

Sensitivity	Proxy variables	Structural Shocks			
		Oil Price	Global Supply	Global Demand	Total Domestic Shocks
Baseline		**4.4**	**2.8**	**18.3**	**74.5**
Commodity prices	Real oil price	5.8	3.7	19.3	71.2
	Nominal energy price	6.4	3.4	19.2	71.0
Global factor measures	Median	5.1	3.1	28.3	63.5
	Weighted average	5.2	3.0	26.0	65.8
Aggregation of all countries	Simple average	6.0	3.5	19.4	71.1
	Weighted average	6.7	2.8	20.0	70.5
Aggregation of advanced economies	Simple average	6.7	4.2	22.7	66.4
	Weighted average	9.6	3.8	25.5	61.1
Aggregation of EMDEs	Simple average	5.2	2.8	15.7	76.3
	Weighted average	2.0	1.2	10.8	86.0
Aggregation of all countries (1970–1985)	Simple average	7.8	8.1	12.3	71.8
	Weighted average	5.9	7.2	9.8	77.1
Aggregation of all countries (1986–2000)	Simple average	7.4	6.1	10.2	76.3
	Weighted average	9.6	5.3	20.8	64.3
Aggregation of all countries (2001–2022)	Simple average	8.8	3.0	28.4	59.8
	Weighted average	12.0	2.3	34.4	51.3

Note: This table reports average, median or weighted-average (across countries) variance decompositions of domestic inflation based on different robustness exercises. Country-specific variance decompositions are based on median from 1,000 successful Bayesian draws. “Baseline” indicates median variance decompositions of domestic inflation based on country specific FAVAR models. The robustness exercise based on commodity prices replaces global nominal oil price growth with either global real oil price growth or global nominal energy price growth. The robustness based on global factor measures replaces the global factors of output growth and inflation with either median or weighted average across countries. The robustness based on the aggregation of countries replaces the results based on averages across countries with either medians or weighted averages across countries.

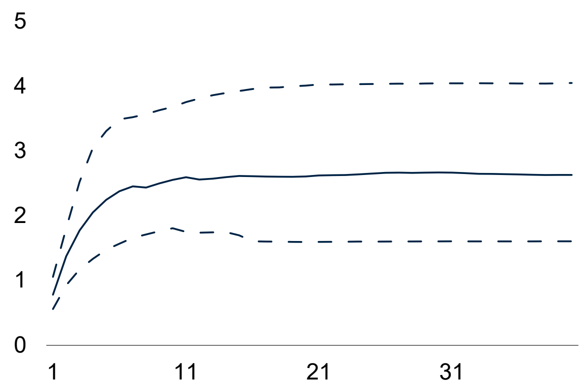
Figure 1. Share of countries with statistically significant impulse responses
(percent of total sample)



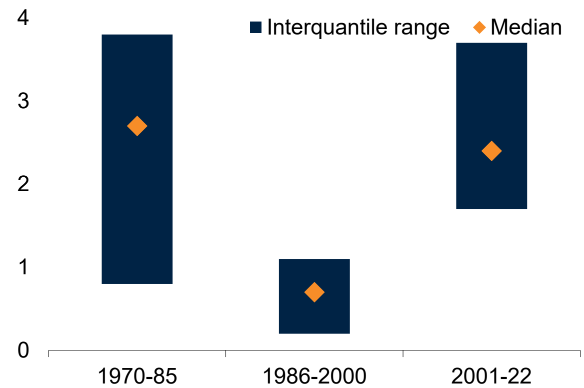
Note. Share of countries with statistically significant cumulative impulse responses of domestic inflation after two years to a one-standard-deviation shock to global demand, global supply, and oil prices. Estimated results are considered to be statistically significant if they are within a 16–84 percent confidence band.

Figure 2. Impulse responses of inflation to global shocks
(percent deviation)

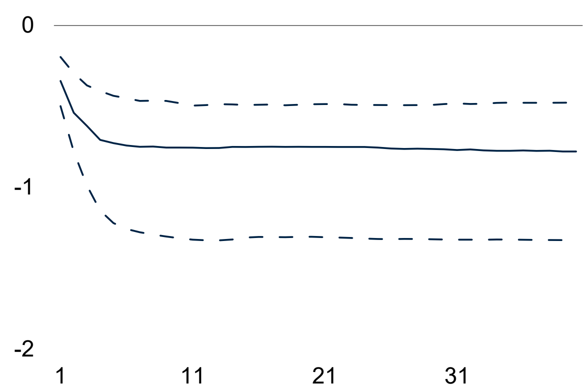
A. Global demand shock: 1970–2022



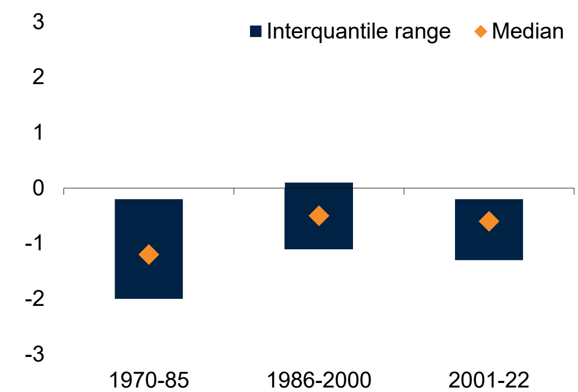
B. Global demand shock: over time



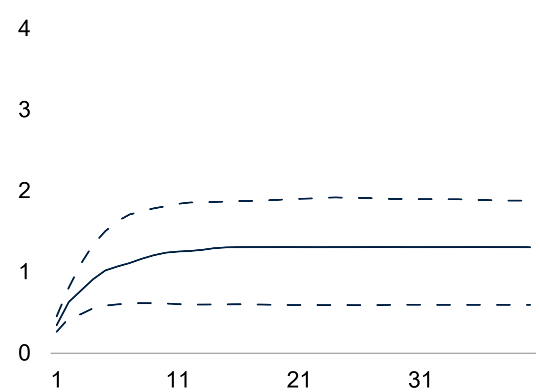
C. Global supply shock: 1970–2022



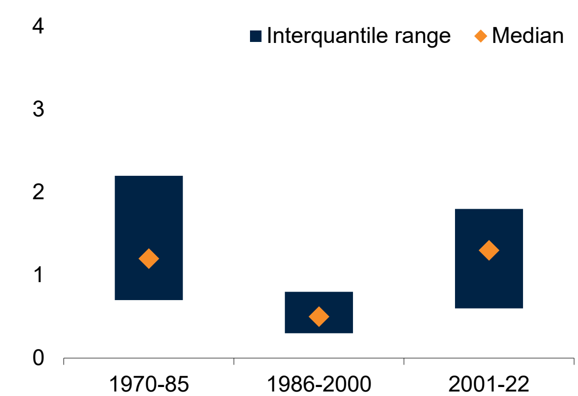
D. Global supply shock: over time



E. Oil price shock: 1970–2022



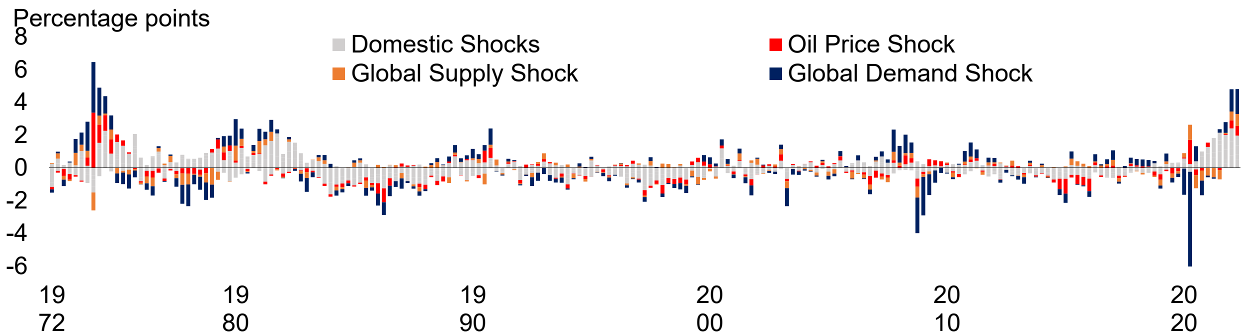
F. Oil price shock: over time



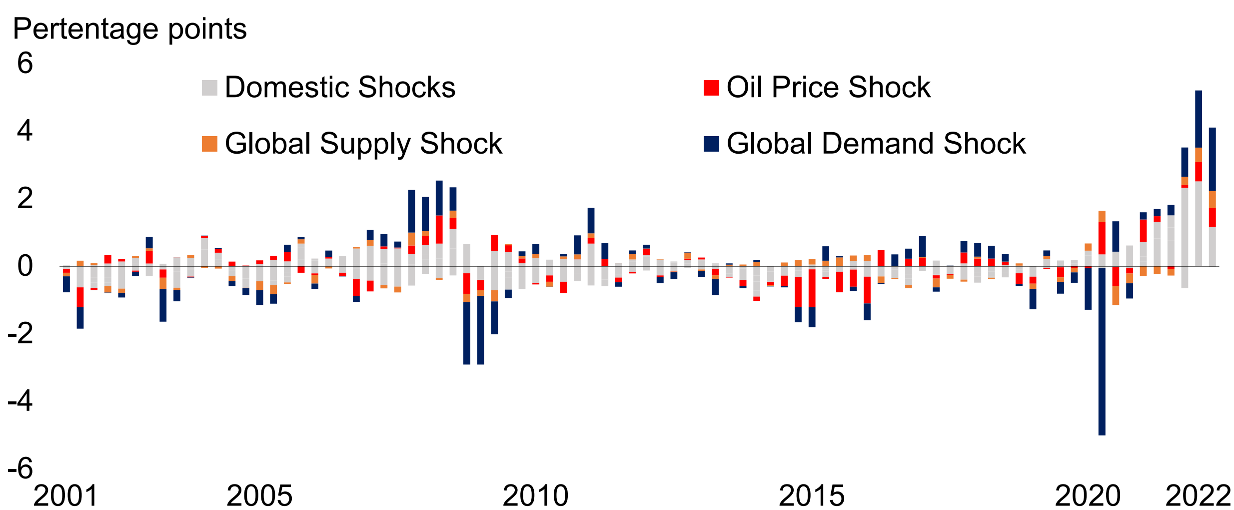
Note: Cumulative impulse responses of domestic inflation on impact over time (A, C, E) or over two years (B, D, F) to one-standard-deviation positive shock based on the country-specific factor-augmented vector autoregression models, estimated for 29 advanced economies and 26 EMDEs for 1970–2022. Solid lines and diamonds show median (50th percentile), and dotted lines and blue bars indicate 25th–75th percentiles of country-specific results.

Figure 3. Historical contributions of shocks to inflation
(percentage points)

A. 1970–2022



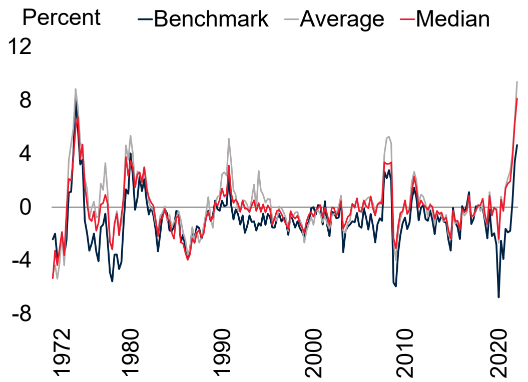
B. 2001–2022



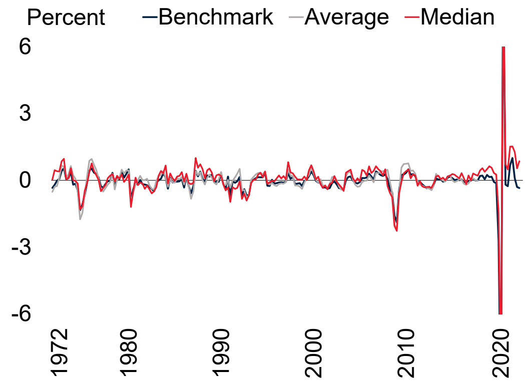
Note: Historical contributions (cross-country averages) of global shocks (global demand, supply, and oil price shocks) and domestic shocks based on full-sample (A, 1970–2022) and subsample (B 2001–22) to the level of inflation. Country-specific factor-augmented vector autoregression models are estimated for 29 advanced economies and 26 EMDEs for 1970–2022.

Figure 4. Alternative measures of global inflation, global output, and oil prices
(percent)

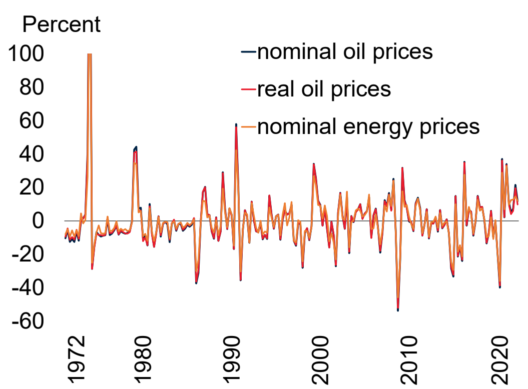
A. Global inflation



B. Global output growth



C. Growth rates of nominal oil prices, real oil prices, and nominal energy prices



Note. Parts A.and B: "Benchmark" indicates global inflation factor and global output growth factor extracted from 47 and 29 countries, using seprate dynamic factor models. "Average" indicates alternative global factors for inflation and output growth based on a simple average across countries. "Median" indicates alternative factors for inflation and output growth across coutnries. Part C: Nominal oil and energy prices are based on data from the World Bank's Pink Sheet. Real oil prices are deflated using the U.S. Consumer Price Index. All variables are based on quarter-over-quarter growth rates of prices levels or output where long-term trends (60-quarter moving averages) are eliminated in calculating the global factors and median/average inflation and output growth.

Appendix

Table A1. List of countries: 1970Q2-2022Q2

Country	Sample period	Country	Sample period
Australia	1970:2 – 2022:2	Iceland	1988:3 – 2022:2
Austria	1990:1 – 2022:2	India	1993:3 – 2022:2
Azerbaijan	2005:3 – 2022:2	Israel	1985:3 – 2022:2
Belgium	1970:2 – 2022:2	Italy	1979:2 – 2022:2
Bulgaria	1994:4 – 2022:2	Jordan	1999:3 – 2022:2
Brazil	1998:3 – 2022:2	Japan	1989:3 – 2022:2
Botswana	1994:4 – 2022:2	Korea, Rep.	1991:3 – 2022:2
Canada	1970:2 – 2022:2	Luxembourg	1999:3 – 2022:2
Switzerland	1970:3 – 2022:2	Macedonia, FYR	2008:1 – 2022:2
Chile	1970:3 – 2022:2	Malta	1999:3 – 2022:2
China	1984:4 – 2022:2	Malaysia	2004:4 – 2022:2
Colombia	1994:4 – 2022:2	Mexico	1978:1 – 2022:2
Costa Rica	1997:3 – 2022:2	Morocco	1995:4 – 2022:2
Czech Republic	1992:4 – 2022:2	Netherlands	1982:3 – 2017:4
Germany	1970:2 – 2022:2	Norway	1979:2 – 2022:2
Denmark	1970:2 – 2022:2	New Zealand	1974:3 – 2022:2
Dominican Republic	2004:3 – 2022:2	Philippines	1987:3 – 2022:2
Egypt, Arab Rep.	2002:4 – 2022:2	Poland	1992:1 – 2022:2
Spain	1977:3 – 2022:2	Portugal	1986:2 – 2022:2
Finland	1987:3 – 2022:2	Russian Federation	1997:1 - 2022:2
France	1970:2 – 2022:2	Slovak Republic	1996:1 – 2022:2
United Kingdom	1970:2 – 2022:2	Slovenia	2002:3 – 2022:2
Greece	1994:4 – 2022:2	South Africa	1981:3 – 2022:2
Honduras	2005:4 – 2022:2	Sweden	1983:3 – 2022:2
Hungary	1995:4 – 2022:2	Thailand	2000:4 – 2022:2
Indonesia	1990:3 – 2022:2	Tunisia	2000:4 – 2022:2
Ireland	1984:3 – 2022:2	Turkey	2006:3 – 2022:2
		United States	1970:2– 2022:2

Table A2. Dataset for country characteristics

Characteristics	Measures	Description	Source
Commodity import	Commodity importer	An economy is defined as commodity exporter when, either (i) total commodities exports accounted for 30 percent or more of total goods exports or (ii) exports of any single commodity accounted for 20 percent or more of total goods exports. All other countries are considered commodity importers.	World Bank (2018)
	Net energy import	Net fuel imports, defined as fuel imports minus fuel exports as percent of GDP	World Development Indicators (WDI)
Financial openness	International asset and liability	De facto financial openness, defined as the sum of international assets and liabilities as a percent of GDP	Lane and Milesi-Ferretti 2007; IMF Balance of Payments and International Investment Position Statistics
	Chinn-Ito Index	De jure financial openness as in Chinn-Ito Index (2006)	Chinn and Ito (2006)
	Capital control	Capital Control Measures data set of restrictions on capital account inflows and outflows for 10 categories of assets	Fernandez et al. (2016)
Trade openness	Trade-to-GDP	Sum of exports and imports of goods and services as percent of GDP	WDI; IMF WEO
	Trade concentration	Product concentration and diversification indexes of exports and imports	UNCTAD
	Tariff	Average effective tariff, weighted by product-level import share from each partner country	World Integrated Trade Solution (WITS)
	Global Value Chain	A dummy variable for high integration into global value chains, defined as one of two conditions being met: the sum of backward and forward participation in global value chains is greater than the median of the sample in a particular year, or the intermediate trade ratio is greater than the median of the sample in a particular year	OECD-WTO TiVA
Monetary Policy framework	Inflation Target	Dummy variable; 1=inflation targeting; 0=not inflation targeting	IMF AREAER; Carare and Stone (2006); Caceres, Carriere-Swallow, and Gruss (2016)
	Central Bank Independence	Transparency and independence for central banks as in Dincer and Eichengreen (2014)	Dincer and Eichengreen (2014)
	Central Bank Turn-over	Number of changes the heads of central banks before the end of his or her legal term in office	Dreher, Sturm, and de Haan (2010)
Exchange rate regime	De-Facto regime	The exchange rate regime classification of Shambaugh (2004). Countries with exchange rates that routinely fluctuate outside a 2-percent band are considered floating regime. Other countries are considered pegged regime.	Shambaugh (2004); IMF AREAER
	De-Jure regime	De jure exchange rate regime. Ilzetzki, Reinhart, and Rogoff (2019). Countries with managed floating or freely floating are treated as flexible exchange rate regimes and as pegged regimes otherwise.	Ilzetzki, Reinhart, and Rogoff (2019)
Debt level	Public debt	Gross public debt as percent of GDP	Abbas et al. (2011); Mauro et al. (2015); IMF Historical Public Debt Database; IMF World Economic Outlook