Decomposed Oil-Driven Inflation Persistence and Asymmetric Shocks
*

Joseph Agyapong†

Eric Atanga Ayamga‡

February 13, 2025

Abstract

This paper employs 44-year datasets (1980M1 to 2024M3) to examine the effects of oil price components on the inflation persistence of the top 10 oil-dependent economies. We propose a framework that measures inflation persistence through two specifications: error-based and intrinsic-based persistence. We decompose the oil price into returns, cyclical components, permanent trends and innovations to estimate their distinct impacts. The results reveal that oil returns and cyclical oil price components reduce inflation persistence in net-exporting oil economies (except Brazil) but significantly increase inflation persistence in net-importing oil economies (except China). The permanent oil prices reduce the intrinsic-based persistence in the US, Germany, Canada, India, Brazil and Korea. Applying a regime-switching local projection, we identify asymmetric oil price impact on inflation persistence through the transmission channel of extreme oil price shock, exchange rate movements and intensity of geopolitical risk. Notably, in extreme geopolitical risks, inflation persistence significantly increases in reaction to oil shocks in net-importing oil economies (except Korea). These results underscore the need to address specific oil price components to manage inflation effectively and also support the central banks with more effective monetary policy measures that address oil-driven inflation.

Keywords: Inflation persistence, cyclical oil price, permanent oil price, oil innovation, regime-switching local projections
JEL: E31, C51

---

*Declarations of interest:** none.

†FernUniversität in Hagen, Faculty of Business Administration and Economics, Chair for Macroeconomics, Universitätsstr. 11, D-58097 Hagen, Germany, e-mail: josephagyapong06@gmail.com

‡Texas Tech University, Department of Economics, P. O. Box 41014 Lubbock-Texas 79409-1014, United States, e-mail: eayamga@ttu.edu

1 Introduction

In mid-2021, the world experienced a surge in inflation, which prevailed into early 2022. This period of rising prices, exacerbated by the Russia-Ukraine war causing an increase in energy prices, led to significant economic instability in several major economies, including the United States, Germany, and Canada, where inflation rates reached alarming levels. The prolonged increase in inflation and energy prices has raised concerns among policymakers and researchers, seeking to understand the underlying causes and persistence of these inflationary pressures.

Recent studies such as Kilian & Zhou (2023*b*) attribute the sustained inflationary surge to oil shortages which led to the sharp rise in oil prices in that period. Similarly, Gagliardone & Gertler (2023) confirmed that the recent inflation rise in the US is tied to oil price shocks and easy monetary policies. While understanding the level of inflation itself is imperative, it is more important for policymakers and firms who formulate expectations about future inflation to know the degree and sources of inflation persistence - the phenomenon where inflation remains elevated even after the initial shock that caused it has subsided - and the duration high inflation lasts is very important to a policymaker and firms (Fuhrer, 2010). Several studies have explored various factors influencing inflation persistence, including domestic conditions (Gaglianone et al., 2018; Kamber & Wong, 2020), exchange rates (Burdekin & Siklos, 1999), and monetary policies (Oloko et al., 2021). Given the significant influence of oil prices on global economic conditions, evidence concerning the oil impact on the inflation persistence of the oil-importing economies that are highly exposed to oil price shocks is low and this is what the study seeks to do.

Despite crude oil not being part of the consumer price index basket of goods (Kilian & Zhou, 2023), its shocks significantly affect inflation due to its importance in economic activity. Besides, the impact of oil prices on inflation persistence can be heterogeneous through various channels and across different contexts. For example, a transitory rise in oil prices resulting from supply disruptions or geopolitical may have a distinct impact on inflation persistence compared to a long-term upward trend in oil prices. This highlights the need for empirical research that examines these effects, especially in the major oil-importing economies.

Our main objective is to decompose oil prices into several components and examine how they heterogeneously impact inflation persistence. Specifically, we focus the empirical analysis on the world's top 10 economies that heavily depend on oil. According to the United States (US) Energy Information Administration[1] (EIA) in 2022, these countries collectively accounted for 61% of the total world oil consumption. The top 10 oil-importing countries with their share of world total consumption include the US (20%), China (15%), India (5%), Russia (4%), Saudi Arabia (4%), Japan (3%), Brazil (3%), Korea (3%), Canada (2%) and Germany (2%). Notably, in 2023, six of these nations were also among the top 10 oil-exporting countries, including the US (22%), Saudi Arabia (11%), Russia (11%), Canada (6%), China (5%) and Brazil (4%). This underscores the importance of our selected sample for this analysis. Based on these statistics, we categorize these economies into net-importing oil economies (Germany, Japan, China, Korea and India) and net-exporting oil economies(US, Canada, Brazil, Russia and Saudi Arabia). We analyze and compare oil-driven inflation persistence across both net-importing and net-exporting oil economies.

The study addresses these key questions: How does the degree of inflation persistence vary over time? How do oil price shocks differently affect inflation persistence in net-importing and net-exporting oil countries? And does decomposing oil prices provide a more nuanced understanding of their impact on inflation persistence?

[1]https://www.eia.gov/tools/faqs/faq.php?id=709&t=6

Our research contributes to the literature on inflation persistence in three distinct ways. First, we set the specifications of inflation persistence into two: error-based which is an idiosyncratic component of the inflation error structure and intrinsic-based persistence which is incorporated into the inflation process. This makes it easy to investigate the effects of oil price shocks on different specifications of inflation persistence. For robustness, we consider half-life inflation persistence as the third specification. Our study is novel as we apply these specifications to examine the direct and indirect effects of oil prices. Second, we decompose the oil price into returns, cyclical components, permanent oil price (long-term trends), and oil innovation and investigate the effects of each decomposed oil price component on the different specifications of inflation persistence. Finally, we create transmission mechanisms through which oil prices drive inflation persistence. For instance, we contribute to Burdekin & Siklos (1999) and Giannellis & Koukouritakis (2013) by analyzing exchange rate transmission channel; to Zhao et al. (2016) and Mignon & Saadaoui (2024) by examining the effect of geopolitical intensity and also look into the degree of oil price shocks. We then apply Jordà (2005)'s regime-switching local projection that incorporates these transmission channels of extreme oil price shocks, exchange rate movements and intensity of geopolitical to assess the asymmetric effects of oil price shocks on inflation persistence.

The results reveal that oil returns and cyclical oil price components reduce inflation persistence in net-exporting oil economies except for Brazil. In contrast, cyclical oil price significantly increases inflation persistence in net-importing oil economies. The permanent oil prices decrease the intrinsic-based persistence in the US, Germany, Canada, India, Brazil and Korea. We further identify asymmetric oil price impact on inflation persistence through the transmission channel of extreme oil price shock, exchange rate movements and intensity of geopolitical risk.

The remaining study is structured as follows: section 2 reviews the existing literature, section 3 discusses the theoretical framework employed, and section 4 presents the data. Section 5 presents and discusses the empirical results and section 6 concludes with policy implications.

2 Literature Review

2.1 Oil Price Shocks and Inflation Rate

Extensive studies have explored the effects of oil price shocks on inflation at different levels. For instance, Conflitti & Luciani (2019) showed that oil price shocks have a substantially low but long-lasting effect on core inflation in the US and Euro areas. Jiranyakul (2019) and Nasir et al. (2018) found similar evidence for Thailand and BRICS countries respectively. Likewise, Sek et al. (2015) reports that oil price shock has a direct effect on low-oil-dependent countries and an indirect effect on high-oil dependence through the cost of production.

Most studies explore the effects of the types of oil price shocks on the inflation rate. For instance, Zhao et al. (2016) and Wen et al. (2021) identified the effects of different shocks on the inflation rate in China and G7 countries respectively. Zhao et al. (2016) found that oil supply shocks driven by political activities in oil-producing economies mainly produce short-term effects on China's output and inflation, while the other three shocks produce relatively long-term effects. However, Wen et al. (2021) found that the effect of oil supply shocks on inflation was strong before the financial crisis, but weakens during the crisis for all G7 countries. Nevertheless, the effect of oil demand shocks sharply increased after the financial crisis.

Also, most of the literature on oil price shocks explore its effects on inflation expectations. Nasir et al. (2020) explores the effects of oil price shocks on inflation expectations in Norway, Sweden, and Denmark. They found substantial non-linearities and asymmetries in the effect of oil price shocks on inflation expectation, of which the effect is stronger for oil net importers. Importantly, the authors found that inflation expectations are rigid downward. Kilian & Zhou (2022) showed that oil price shocks account for about 42% of US consumer expectations.

Moreover, the literature on the effects of oil price shocks on inflation have also extended extensively to the nonlinearity and asymmetry of the effect. Salisu et al. (2017) demonstrated that oil prices have positive long-run effects on inflation in both net oil-importing and net oil-exporting countries. The long-run effect is larger for net oil-importing countries, while oil-exporting countries tend to have more asymmetries. Cheikh et al. (2023) found a non-linearity in the dynamics of oil price pass-through for the Eurozone area. The authors also found that geopolitical events amplify the oil price pass-through. Besides, Anyars & Adabor (2023), Garzon & Hierro (2021), Li & Guo (2022), and Moshiri (2015) found evidence of asymmetries in different contexts.

These studies show the relationship between oil prices and inflation but do not examine the inflation persistence which has become critical following the Russia-Ukraine war and this gap is what we seek to fill.

2.2 Drivers of Inflation Persistence

Inflation persistence is crucial because it significantly impacts how inflation behaves over time and how central banks approach it. A strand of studies has empirically demonstrated various causes of inflation persistence. For instance, Burdekin & Siklos (1999) show that changes in exchange rate regimes are the main cause of sharp increases in inflation persistence. They found multiple structural shifts at unknown dates which they attributed to wars, oil shocks, and unusual bank reforms. Likewise, Giannellis & Koukouritakis (2013) found that inflation persistence in Latin America is due to currency undervaluation. Other empirical studies have found similar results in various contexts (see Bleaney, 2000; Kuralbayeva, 2011).

Kilian (2010) showed that inflation persistence in the 1970s and 1980s resulted from worldwide shifts in monetary policy regimes. Other empirical studies have established that higher inflation persistence before the 1990s is due to the conduct and credibility of monetary policies as measured by consumer expectations (Bems et al., 2021; Williams, 2006; Bernanke, 2007). These authors attribute the recent stability in inflation in many advanced economies to the conduct and credibility of monetary policies, thus well-anchored consumer inflation expectations.

Geronikolaou et al. (2020) argued that inflation persistence in 28 OECD countries results from progressive taxes and labor mobility. However, Niemann et al. (2013) attribute inflation persistence to rising public debt and fiscal discretionary policies. Similarly, Bianchi et al. (2023) found that inflation, interest rate, and unemployment rates are persistently high when central banks accommodate unfunded fiscal shocks.

3 Theoretical Framework

Economic studies have shown that the changes in the reduced-form inflation persistence are proportional to the changes in the underlying inflation determinants (Fuhrer, 2010). This is commonly demonstrated using the stylized, backward-looking inflation model. Starting with a simple Philips curve equation, where a change in inflation is positively proportional to an output gap,

$$\pi_t - \pi_{t-1} = \kappa g_t, \tag{1}$$

where π_t is inflation rate, g_t is the output gap, $\kappa > 0$.

The output gap is then linked to the central bank's policy rate (i_t) negatively,

$$g_t = -\phi i_t \tag{2}$$

while the central bank adjusts the short-run policy rate depending on the level of inflation.

$$i_t = \lambda \pi_t. \tag{3}$$

Now, combining Equations (1), (2) and (3), we get

$$\pi_t = \mu \pi_{t-1} = \frac{1}{1 + \kappa \phi \lambda} \pi_{t-1}. \tag{4}$$

This leads to an autoregressive process of inflation rate (AR(p))

$$\pi_t = \mu_0 + \mu_1 \pi_{t-1} + \mu_2 \pi_{t-2} + ... + \mu_p \pi_{t-p} + \epsilon_t \tag{5}$$

In a simple form

$$\pi_t = \mu_0 + \sum_{j=1}^{p} \mu_j \pi_{t-j} + \epsilon \tag{6}$$

where μ_j refers to the autoregressive coefficient with j number of lag and P the optimal lag level.

Inflation persistence can be explained from Equation 6 as the rate or speed with which past inflation rates affect the current inflation or how inflation converges to equilibrium after a shock. This implies that inflation persistence increases when it delays returning to the equilibrium after the shock. The transmission mechanism for smaller inflation persistence occurs when the central bank greatly reacts to inflation by increasing the policy rate to revert the increasing inflation to its target level. The output gap will be reduced if it responds more to the higher policy rate. The reduction in the output gap eventually leads to a reduction in the changes in inflation. Therefore, the reaction of the central banks reduces the level of inflation persistence. From Equation 6, we consider two alternative specifications of inflation persistence: the error-term inflation persistence and the intrinsic inflation persistence which is observed with the coefficient of the lags of inflation (μ_j). These specifications will be discussed in detail in the subsequent sections.

Generally, studies have examined inflation persistence from the backward-looking model using different measures. One of the frequently used measures is the first-order autoregression (AR(1)) which explains the extent to which the first lag of inflation determines the current inflation. This measure of inflation persistence has been employed by Cutler (2001) and Demarco (2004). Another widely used measure is the sum of the autoregressive coefficients (cumulative inflation persistence) proposed by Andrews & Chen (1994). This measure has been utilized in several literature such as Marques et al. (2004) and Bilke & Stracca (2007). According to Marques et al. (2004) the cumulative measure gives the best estimate of the inflation persistence. Therefore, for robustness checks, our study employs the cumulative measure for different specifications of inflation persistence such as error-term inflation persistence and intrinsic inflation persistence. We will further examine the half-life specification of inflation persistence where the AR(1) is used.

3.1 Specification of Error-Based Inflation Persistence

Next, we begin with the error-based specific that explains the extent to which disturbance to inflation continues to affect future inflation. This is the unobserved components model that estimates the relative contribution of permanent and transitory components of inflation. Our error-based persistence is in line with studies that examine inflation persistence using the total variance of the inflation gap emanating from past shocks. This suggests that, if past shocks explain a high fraction of the variation of future inflation gaps, then the persistence is high and vice versa (Cogley et al., 2010; Ascari & Sbordone, 2014).

Specifically, we build on the idiosyncratic component of the error term in Equation 6, to model the error-based inflation persistence as the unobserved components decomposition of inflation (thus, the random term ϵ_t) which is subjected to autocorrelation.

$$\epsilon_t = \alpha_t \epsilon_{t-1} + \nu_t \tag{7}$$

where ϵ_t is the error term from Equation 6. α_t is the coefficient that measures the persistence of the shocks to current inflation. We define the error-based inflation persistence as the case when $\alpha_t > 0$. We further look into this as a function of the oil price components in Equation 8 below,

$$\alpha_t = \beta_1 + \beta_2 OP_{t-1} + \omega_t \tag{8}$$

where OP_{t-1} is the lag of the oil price components (see section 3.3). Since our objective is to examine inflation persistence, we assume that changes in the oil price are not immediate as they pass through to consumer prices and inflation can be delayed due to production lags and consumers' gradual adjustment to price changes. Hence, analyze the lagging effect of the oil price components instead of their contemporaneous effect. Putting Equation 8 into 7 gives

$$\epsilon_t = \beta_1 \epsilon_{t-1} + \beta_2 \epsilon_{t-1} OP_{t-1} + (\omega_t \epsilon_{t-1} + \nu_t) \tag{9}$$

The last bracket in Equation 9 becomes a heteroskedastic error term. Equation 9 can then be written in the form

$$\epsilon_t = \beta_1 \epsilon_{t-1} + \beta_2 \epsilon_{t-1} OP_{t-1} + \upsilon_t \tag{10}$$

We further introduce a constant, a lag oil price shock and other control variables: US broad effective exchange rate (FXUS), global economic activity index (GREA) and economic policy uncertainty (EPU) for the US dollar dominance, global demand for industrial commodities and policy uncertainties respectively into Equation 10 given the error term inflation persistence model as

$$\epsilon_t = \beta_0 + \beta_1\epsilon_{t-1} + \beta_2 OP_{t-l} + \beta_3(\epsilon_{t-1}OP_{t-1}) + \beta_4 FXUS_{t-1} + \beta_5 GREA_{t-1} + \beta_6 EPU_{t-1} + \upsilon_t \tag{11}$$

Equation 11 can be represented in terms of partial derivatives to capture the conditional impact of the oil price on inflation persistence as the partial derivative with respect to ϵ_{t-1}:

$$\frac{\partial \epsilon_t}{\partial \epsilon_{t-1}} = \beta_1 + \beta_3 OP_{t-1} \tag{12}$$

This shows that the effect of lagged inflation error (ϵ_{t-1}) on current inflation error (ϵ_t) depends on the coefficient β_1 and is conditional on the lagged oil price (OP_{t-1}) through the interaction term.

Again, the partial derivative with respect to OP_{t-1} can be expressed as:

$$\frac{\partial \epsilon_t}{\partial OP_{t-1}} = \beta_2 + \beta_3 \epsilon_{t-1} \tag{13}$$

This indicates the impact of the lagged oil price on current inflation error, which is influenced by the coefficient β_2 and conditional on lagged inflation (ϵ_{t-1}) error via the interaction term.

The interaction term captures the conditional effect of the lagged oil price on the persistence of inflation errors. That is, for a stronger or strict condition, inflation persistence from oil price shock exists if $\beta_3 > 0$ and is statistically significant.

3.2 Specification of Time-Varying Intrinsic Inflation Persistence

The intrinsic inflation persistence concerns the price and wage mechanism which is linked to the coefficient of the lags of inflation. The intrinsic inflation persistence implies that shocks in the past affect current inflation relating to the autocorrelation of inflation. We examine the intrinsic inflation persistence by computing the time-varying coefficient of the lags of inflation as given in Equation 14 below using a 10-year rolling window regression model

$$\pi_t = \mu_{0t} + \mu_{1t}\pi_{t-1} + \mu_{2t}\pi_{t-2} + ... + \mu_{pt}\pi_{t-p} + \epsilon_t. \tag{14}$$

Equation 14 presents the time-varying autoregressive process of inflation as explained in Equation 5

The reduced form inflation autoregressive time-varying form below

$$\pi_t = \mu_{0t} + \sum_{j=1}^{p} \mu_{jt}\pi_{t-j} + \epsilon \tag{15}$$

where μ_{jt} refers to the time-varying autoregressive coefficient with j number of optimal lag at time t. In other words, μ_{jt} measures the time-varying intrinsic inflation persistence which is the degree of intrinsic inflation persistence over time. There is higher inflation persistence when μ_{jt} is closer to 1.

Following Andrews & Chen (1994), we measure the cumulative intrinsic inflation persistence as computed in the expression:

$$\rho_t = \sum_{j=1}^{p} \mu_{jt} \tag{16}$$

where the optimal lag, p is selected using the Schwarz information criterion (BIC).

We examine the oil impact on the intrinsic inflation persistence using the specification below

$$\rho_t = \beta_0 + \beta_1 OP_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t. \tag{17}$$

where OP_{t-1} is the lag of the oil price components (again see section 3.3). Again, the intrinsic inflation persistence is examined through the past inflation rates, explaining its dynamics over time. Hence, using the lagged oil price components appropriately captures the dynamics adjustments and influences over time while avoiding endogeneity challenges.

3.3 Modeling Oil Price Decomposition

Economic dynamics are tied to oil prices. We need to state that oil prices are associated with various factors which to some extent have different implications for inflation persistence. To better analyze this we decompose oil prices into returns, cyclical, permanent trends and innovations. This provides a comprehensive understanding of how different aspects such as permanent and temporary dynamics of oil prices influence inflation dynamics. The oil price return (OPR) is defined as the log-returns of the oil price ($log(OilPrice_t) - log(OilPrice_{t-1})$) which is commonly used to examine the short-term impact.

On the other hand, the cyclical oil price (COP) explains the short-and medium-term oil price dynamics. While the COP is not typically referred to as a shock itself, it generates a pure transitory oil price-driven inflation persistence such as supply disruptions or geographical events that may not affect the long-term trend. We measure this component using detrending techniques, thus subtracting the long-run trends from the oil price at the level. Besides the cyclical component of the oil price, the trend component which we referred to as the permanent oil price (POP) significantly explains the long-term oil price dynamic which is suitable for analyzing structural change. We estimate the oil trend component using a 12-month simple moving average (SMA) and Hodrick-Prescott (HP) filter for robustness checks. This is in line with Blanchard & Gali (2007), who perform oil price decomposition using the HP filter. Moreso, extant literature provides support for the use of the SMA to identify oil price movements that are smoother and more stable for trend analysis (Sadorsky, 2006; Kaufman, 2013). Intuitively, a rising trend indicates a permanent oil price that spills over to the global economy causing demand shock and eventually transmitting to inflation dynamics.

Next, considering the recent period of high volatility and uncertainties in the oil market which emanate from the geopolitical war, modeling oil price innovations and how they influence inflation persistence become a global phenomenon. We measure oil price innovation (OPI) as the deviation of the current oil price from the fitted oil price condition on the past price behavior. The OPI is simply the error term of the current oil price regressed on the optimal lag of the oil price (AR(p)):

$$OilPrice_t = c + \sum_{j=1}^{p} \psi_j OilPrice_{t-j} + z_t \tag{18}$$

where z_t is the oil price innovation.

3.4 Estimation Approach

After performing the methodological specification to explain the inflation persistence in sections 3.1 and 3.2, we proceed to estimate the individual oil price decomposition impact using a robust linear regression model with other control variables.

Next, we move to a combined regression that considers the interaction between the individual oil price components, providing a more comprehensive picture. To do this, we apply the Bayesian Model Averaging (BMA) used in Raftery et al. (1997); Hoeting et al. (1999) which utilizes information from all possible combinations of the oil price decomposition, giving more informative results (check Appendix B for details of the methods). These methods mitigate the issue of model uncertainty which stirs by increasing regressors. Our focus is on the Posterior Inclusion Probability (PIP). PIP shows the probability of an individual component of the oil price in the combined regression model that has the robust power to impact inflation persistence. As a rule of thumb, an individual component of the oil price impact on inflation persistence is considered weak, positive, strong, or very strong if the PIP falls within the range of 0.50-0.75, 0.75-0.95, 0.95-0.99, or is greater than 0.99, respectively.

4 Data

Monthly datasets spanning from 1980M1 to 2024M3 (44 years)[2] are used for the empirical analysis of the top ten oil-dependent economies which we categorize into net-importing oil economies (Germany (DE), Japan (JP), China (CN), Korea (KR) and India (IN)) and net-exporting oil economies(United States(US), Canada (CA), Brazil (BR), Russia (RU) and Saudi Arabia (SA)). This larger data sample includes several important global events that have significantly affected the global economies, such as the 2008 Global Financial Crisis, the COVID-19 pandemic, the Russia-Ukraine war, etc. We use the total consumer price index and compute the year-on-year inflation rates and bilateral real exchange rates which are sourced from the Bank of International Settlements (BIS).

Also, the WTI, Brent and Dubai crude oil prices are extracted from the Federal Reserve Bank of St. Louis, US Energy Information Administration[3] and International Monetary Fund. The economies used for our analysis have different geopolitical relations and trade oil with different benchmark prices. This means it can be misleading if only one benchmark price is used for all the countries. Therefore, to get a better crude oil price which reflects a global oil price from the three common crude oil benchmark prices, we took a simple average of the three prices. It is worthwhile to stress that when discussing the inflationary impact of oil price shocks on countries other than the US, the price of oil in domestic currency is what matters. Therefore, we further converted the dollar price of oil into domestic currency using the real bilateral exchange rate against the US dollar. As outlined in section 3.3, we decomposed the domestic price of oil into; i) Oil price returns (OPR) ii) Cyclical oil price (COP) iii) Permanent oil price (POP)

[2]Except for China which due to availability of data starts from 1995. Russia also starts in 2001 and Saudi Arabia begins in 1990.

[3]https://www.eia.gov/dnav/pet/pet_pri_spt_s1_d.htm

iv) Oil price innovation (OPI)

We account for the impact of the demand for industrial commodities in the global market and the dominance of the US dollar used for pricing in international markets such as the oil markets by adding Kilian (2009)' measure of the global real economic activity index ($GREA$) and the US broad effective exchange rate ($FXUS$) as control variables. $FXUS$ and $GREA$ are sourced from the Federal Reserve Bank of Dallas. Besides, we include the countries' economic policy uncertainty index[4] (EPU) as measured by Baker et al. (2016) to account for the effect of the local policy uncertainties. We use the global index EPU as a proxy for Saudi Arabia since the local index is not available.

The summary statistics of the data are reported in Table A.1. The inflation rates are relatively stable around their mean value, except in Japan, Brazil and Saudi Arabia the standard deviation of the inflation is higher than the mean in all the countries. Similarly, the EPU is stable as the standard deviation is smaller than the mean across all the countries. Also, the domestic oil prices have been unstable over time as the standard deviations exceed the mean values. However, the FXUS and GREA have been fluctuating frequently suggesting rising uncertainties associated with these variables. All variables are stationary.

5 Empirical Results

5.1 Error-Based Inflation Persistence and Oil Price Decomposition

We begin with the oil-driven inflation persistence based on the error term reported in Tables 1 to 5. Considering the conditions explained in section 3.1, we focus on the interaction between the oil price components and the inflation error term since

[4]https://www.policyuncertainty.com/all_country_data.html

it explains the inflation persistence. We observe that the oil price returns (OPR) do not significantly impact the inflation persistence except in Russia where the inflation persistence significantly reduces in response to the OPR at 5% level (see Table 1).

The cyclical oil price (COP) results are presented in Table 2. With the cross term, we find that an increase in the cyclical oil price increases the inflation persistence in Japan and Brazil while the inverse is observed with Russia. This indicates that aside from inflation persistence decreasing in Russia which is a net-exporting oil economy, COP could significantly increase the inflation persistence in both net-importing and -exporting economies which is consistent with Salisu et al. (2017) and Gaglianone et al. (2018) who find oil price shock increasing inflation persistence in both net-importing and net-exporting oil economies. We believe oil price returns and cyclical oil price shocks reduce Russia's inflation persistence because Russia's crude oil imports are not significant in its overall energy trade balance, thus shocks to crude oil prices do not affect Russia. They are rather beneficiary as they foster foreign reserves through exports, especially positive oil price shocks.

We proceed to the permanent oil price (POP) impact on the error-based inflation persistence by applying the long-run trend in oil prices using simple moving averages and HP trends which is reported in Table 3. The POP interaction with the inflation error term significantly increases the inflation persistence in Germany and Saudi Arabia while the inverse is observed in Russia. We also observed in Table 4 that a rise in oil price innovation (OPI) interaction with the error term reduces the inflation persistence in Russia at a 5% significant level. With these results, we have to state that we have accounted for the impact of the US dollar, the global real economic activity and the economic policy uncertainty.

Building upon the analysis of individual oil price components, we now incorporate all components into a single regression model. This approach allows us to examine their interactions and determine which oil price component exerts the most significant impact on inflation persistence. As already mentioned, we apply the Bayesian Model Average (BMA) and focus on the Posterior Inclusion Probability (PIP) (see Table 5). Again, we only consider the oil price components interacting with the error terms. The OPR is demonstrated to have a very strong impact in China and Brazil while it becomes weak in Russia and Saudi Arabia. The COP only has a very strong impact on Brazil. The POP is strong in Saudi Arabia and weak in Germany, China and Brazil. Moreso, the OPI is very strong in China and Brazil and is weak in Russia and Saudi Arabia. This implies that the interactive impact of the oil price components has the probability of influencing error-based inflation persistence. In the subsequent sections, we analyze intrinsic inflation persistence.

5.2 Dynamics of Intrinsic Inflation Persistence

Next, we discuss the time-varying dynamics of cumulative intrinsic inflation persistence for all ten countries in our sample which we estimate by applying a 10-year rolling regression model (see Figure 1). The inflation persistence was generally low during the 2008/2009 global financial crisis when the global demand for goods and services experienced a significant decline resulting from the interconnected economic disturbances that severely affected the global economy.

Moreover, following COVID-19 and during the Russia-Ukraine war which affected the energy market, significant spikes occurred in inflation persistence in the United States, Germany, Canada, Japan, China, and Korea. Besides, China's inflation persistence has been below average after 2020 due to weaker consumer demand and anchored consumer expectations. The United States, Germany, Canada, and Korea, experienced a significant spike in inflation persistence in early 2022, after which inflation persistence started declining due to strong central bank's response to higher inflation persistence

(Bernanke & Blanchard, 2024). We interpret these spikes as a sign of over-reliance on crude oil for production. Also, we observe that although Japan, China, and Brazil's inflation persistence is rising at a moderate level. On the other hand, Russia's inflation persistence experienced a spike after COVID-19 and during the time they invaded Ukraine but has significantly declined far below its historical average.

In general, the average intrinsic persistence of inflation in these countries is relatively high at a level of 0.9093. The highest persistence of 0.968 is observed in Russia. For the others, Saudi Arabia has the next highest inflation persistence of 0.945, the United States and Germany have the same inflation persistence of 0.94, Japan is 0.935, Korea and China are 0.93, India is 0.91, and Canada is 0.89, second from the least. Brazil has the lowest persistence of 0.7. The volatility of inflation in Brazil proves the low inflation persistence witnessed in Brazil within the sampled periods, as inflation increases and declines within a shorter period. In our next section, we discuss how the various components of the oil price drive this time-varying intrinsic inflation persistence.

5.3 Intrinsic Inflation Persistence and Oil Price Decomposition

We proceed to our second specification of analyzing the persistence of oil-driven inflation based on cumulative[5] intrinsic persistence illustrated in Tables 6 to 10. Table 6 shows the inflation persistence as a function of the oil price returns (OPR). Interestingly, the OPR impact does not significantly affect the intrinsic measure of inflation persistence in both the net-importing and -exporting oil economies.

Dwelling on this result, one may be tempted to conclude that oil price dynamics do not contribute to global inflation persistence even amidst the recent energy crisis. However, this suggests the relevance of decomposing the oil price and examining how the

[5]We also examined the oil impact on the first-order autoregression (AR(1)) measure of the intrinsic inflation persistence, however, the results do not change.

various oil components differently affect inflation persistence. We subsequently analyze how intrinsic inflation persistence responds to the different oil price components such as the cyclical (COP) and permanent (POP) oil dynamics and oil innovations (OPI).

The COP increases the inflation persistence of net-importing oil countries such as Germany, Japan and India. Within the net-exporting oil economies, we notice that the inflation persistence in Russia decreases in response to COP impact (see Table 7). Also, we observe the POP with both the simple moving average and HP filter significantly reduce the cumulative intrinsic inflation persistence in both the net-importing (Germany, China, Korea and India) and -exporting oil economies (US, Canada and Brazil) except in Japan and Saudi Arabia where the inverse occurs(check Table 8). There is no significant impact of the OPI on the intrinsic inflation persistence (Table 9). With the control variables, we find a heterogeneous impact of $FXUS$, $GREA$ and EPU on the inflation persistence.

The PIP result for the combined impact of the oil price components is presented in Table 10. The results demonstrate that the permanent and cyclical oil price components exert a stronger impact on inflation persistence in both the net-importing and -exporting oil economies.

5.4 Asymmetric Oil Price and Intrinsic Inflation Persistence

5.4.1 Extreme and Lower-Medium Oil Price Shock

This section identifies oil price shocks and how their interaction affects inflation persistence. We disentangle the oil shock into "extreme" and "lower-medium" and examine whether an asymmetric oil price shock affects inflation persistence. Recognizing the asymmetry in oil price impacts becomes relevant in creating more robust economic models that integrate these distinctive effects, enhancing the accuracy of inflation predictions and macroeconomic stability estimations. To do this we set a threshold of extreme oil price shock when the oil price returns exceed the 95th percentile which is expressed below:

$$D_{i,t} = \begin{cases} 1 & if\ log(OilPrice_t) - log(OilPrice_{t-1}) \ > \ 95thpercentile, \\ 0 & otherwise. \end{cases} \tag{19}$$

where $D_{i,t}$ is a dummy of oil price shock; $D_{i,t} = 1$ when there is an extreme shock otherwise it is a lower-medium shock.

We then examine the asymmetric shock transmission mechanism of oil price on inflation persistence by incorporating the threshold model in Equation 19 into the local projection proposed by Jordà (2005). This state-dependent or regime-switching local projection is applied in several studies including Ahmed & Cassou (2016), Ramey & Zubairy (2018) and Cloyne et al. (2023) due to its flexibility and less sensitivity to misspecification. The regime-switching local projection is expressed in Equation 20 below

$$\rho_{t+h} = D_{t-1}\left[\beta^h_{0,M} + \sum_{i=1}^{p} \beta^{h+1}_{i,M} y_{t-i} + \sum_{i=1}^{q} \phi_i x_{t-i}\right] + \\ (1 - D_{t-1})\left[\beta^h_{0,N} + \sum_{i=1}^{p} \beta^{h+1}_{i,N} y_{t-i} + \sum_{i=1}^{q} \phi_i x_{t-i}\right] + \epsilon^h_{T,t+h}, \tag{20}$$

where ρ_t represents the dependent variable, in this section we only focus on the cumulative intrinsic inflation persistence. y_t contains lag variables including the oil returns and the dependent variable. The vector of controls x_{t-i} includes the US dollar index ($FXUS$), global real economic activity ($GREA$) and economic policy uncertainty (EPU). p and q are the optimal lags. We execute $h = 1, 2, 3...., 15$ months ahead forecast. β^{h+1}_i denotes the local projection coefficients for each lag i and horizon $h + 1$ and β^h_0 is the intercepts. D_{t-1} represents the lag of the threshold dummy variable. M and N suggest the extreme and low-medium oil shocks respectively. $\epsilon^h_{T,t+h}$ represents the residuals of the asymmetric model which are a moving average of the forecast errors from time t to $t+h$ and do not associate with the past regressors. The impulse response (IRF) then becomes the estimated coefficients which are represented below:

$$\widehat{IRF^M}(t,h,n_i) = \widehat{\beta^h_{1,M}} n_i, \tag{21}$$

and

$$\widehat{IRF^N}(t,h,n_i) = \widehat{\beta^h_{1,N}} n_i, \tag{22}$$

where n_i denotes the structural shock to the i^{th} element in y_t. With a clear normalization $\beta^0_{1,M} = I$ and $\beta^0_{1,N} = I$.

The asymmetric oil price shocks to the intrinsic inflation persistence are presented in Figure 2. The persistence of inflation in the net-importing oil economies including Germany, China and Korea significantly increases in response to a standard deviation shock in the oil price in the lower-medium oil shock regime. This increase in inflation persistence takes place in the short run in Germany and Korea while in China it happens after the 6^{th} month. The inverse is observed in Canada, where the inflation persistence significantly decreases following oil price shock in the lower-medium shock regime.

5.4.2 Exchange Rate Movements(Depreciation vs. Appreciation)

Continuing with the asymmetric impact, we examine the transmission channel of the exchange rate. This helps to look into how domestic currency movements influence the pass-through effect of global oil prices (Burdekin & Siklos, 1999; Giannellis & Koukouritakis, 2013). We disentangle the domestic currency exchange rate into its regime of depreciation and appreciation. This is imperative given that the trade openness of these economies associated with their currencies can influence the oil impact in the economy. Similar to section 5.4.1, we generate a threshold of domestic currency depreciation and appreciation:

$$FX_{i,t} = \begin{cases} 1 & if\ \Delta FX_{t-1} > 0, \\ 0 & otherwise. \end{cases} \tag{23}$$

where $FX_{i,t}$ is a dummy of 1 when the domestic currency is depreciating and otherwise it's denoted appreciation. ΔFX_{t-1} represents the respective lag of the log returns of the exchange rate at time t. We plug this Equation 23 into the asymmetric Equation 20.

The intrinsic inflation persistence responses to asymmetric oil price changes condition on the domestic currency is presented in Figure 3. The impact is significant in the net-importing oil economies. For instance, we observe that inflation persistence in Germany increases in reaction to oil prices in the regime of domestic currency depreciation. In contrast, inflation persistence in Korea significantly declines following the oil price shock in the domestic currency depreciation regime. Moreover, Japan and China have their inflation persistence increasing in reaction to the oil price change in the regime of their currency appreciation.

In the next section, we will investigate the asymmetric impact condition on the geopolitical risk.

5.4.3 Geopolitical Intensity

Geopolitical risk plays a crucial role in either amplifying or moderating the economic effects of oil price shocks. Consequently, our third nonlinearity test incorporates the transmission mechanism of the global geopolitical risk measured by Caldara & Iacoviello (2022) to capture its role in shaping these dynamics. This is in line with studies that find that the recent geopolitical risk amplifies the oil price shocks (Zhao et al., 2016; Mignon & Saadaoui, 2024). We create a regime of extreme geopolitical intensity and low-medium geopolitical intensity. With this, we are able to provide a more nuanced analysis of how oil price shocks might affect inflation persistence differently depending on the geopolitical situation. We generate a threshold of extreme intensity when the geopolitical risk exceeds the 95th percentile as represented below:

$$EGPR_{i,t} = \begin{cases} 1 & if\ GPR_{t-1} \ > \quad GPR^{95thpercentile,} \\ 0 & otherwise. \end{cases} \tag{24}$$

where $EGPR_{i,t}$ is a dummy of 1 when it is an extreme geopolitical risk and otherwise it represents low-medium geopolitical risk. GPR_{t-1} represents the respective lag of the geopolitical risk at time t. Similarly, we put Equation 24 into the asymmetric Equation 20.

The results demonstrate an asymmetric impact (see Figure 4). It shows that in the regime of low-medium geopolitical risk, inflation persistence significantly declines following oil price shocks in China, India (in the short run) and the USA (in the long run). The inverse is observed in Russia where the inflation persistence increases when there is low-medium geopolitical risk. On the other hand, in extreme global geopolitical cases, inflation persistence significantly increases (decreases) in reaction to oil price shocks in Germany, Japan and China (Korea).

5.5 Robustness Tests: Half-Life Inflation Persistence

In our main results, we discuss two key specifications: error-based inflation persistence and intrinsic inflation persistence, as detailed in sections 5.1 and 5.3. Besides, we perform a robustness test by considering a third specification, "half-life inflation persistence". This measures the time it takes for an inflation shock to decrease by half. This is largely used to examine the persistence of deviations from the purchasing power parity equilibrium (Murray & Papell 2002; Rossi 2005). The half-life is suitable for measuring the inflation persistence within units of time making it relevant for inflation communication purposes as it explains the number of periods for which the effect of a unit shock to inflation remains over 0.5. Using AR(1) process of Equation 14, we compute the time-varying inflation half-life as

$$hl_t = \frac{ln(1/2)}{ln(\mu_t)} \tag{25}$$

Equation 25 shows the number of times required for the inflation shock to be reduced to half, such that $\mu_t = 1/2$. Intuitively, since the half-life cannot be negative we impose a lower bound of 0, suggesting an immediate adjustment after the inflation shock (Rossi 2005). We proceed to look into the oil impact on the half-life inflation persistence using the specification below

$$hl_t = \beta_0 + \beta_1 OP_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t. \tag{26}$$

where OP_{t-1} is the lag of the oil price components. We identify similar results as discussed in section 5.3(see Appendix C).

5.6 Economic Discussions and Policy Implications

This study analyzed the impact of individual and combined oil price components on inflation persistence across net-importing and net-exporting oil economies. The results show that oil price returns and cyclical oil price components decrease inflation persistence in net-exporting oil economies except for Brazil. Conversely, these short-term oil price components significantly increase inflation persistence in the net-importing oil economies except for China. This is not surprising as we find in Figure 1 that China's inflation persistence has been declining since 2020. These results align with Gaglianone et al. (2018), who find oil price shock increasing inflation persistence. To explore the implication and the transmission mechanism further, we perform a nonlinear analysis incorporating the impact of the extreme geopolitical risk. The results indicate that the recent supply disruptions or geographical events increase the oil price impact on the inflation persistence, especially in oil-dependent economies which is consistent with (Mignon & Saadaoui, 2024).

Also, the cyclical oil price impact confirms structural inflation pressure emanating from the short and medium-term oil price changes following supply disruptions or geographical events. This suggests that through the cost-push channel, an increase in the oil price causes the cost of production increment for goods and services causing the general prices to rise. In economies with sticky wages and prices, workers, particularly relatively skilled workers, could demand wage increments following the higher prices. This so-called "second-round effects" perpetuates inflation persistence (Prasad & Keane, 1995; Majchrowska, 2022; Bernanke & Blanchard, 2024). On the other hand, as cyclical oil prices are transitory, an increase in these prices influences inflation expectations, further entrenching persistence.

The analysis also highlights the role of long-term oil price trends thus permanent oil prices in shaping inflation dynamics. From the error-based specification, we noted that the interaction between the long-run oil price trends and the inflation shocks increases the inflation persistence in Germany and Saudi Arabia while the inverse is observed in Russia. The economic intuition is that Germany as an oil importer, persistent rising oil prices directly increase production and transportation costs across the economy. These cost pressures are passed through to consumers, leading to cost-push inflation interacting with inflation shocks contributing to inflation persistence. In the case of Saudi Arabia, the persistent high oil prices boost its oil revenues, increasing domestic government spending and investment. As a result of the expansionary fiscal policy, there can be overheating in the domestic economy interacting with the inflation shocks, which eventually increases inflation persistence. From the cumulative intrinsic inflation persistence, the long-run oil price trends significantly reduce the inflation persistence, as prolonged increment (decrement) in oil prices lowers (rises) consumer confidence and spending, lowering the total aggregate demand and eventually reducing inflation rates (Baumeister & Kilian, 2016). However, this dynamics varies for Japan and Saudi

Arabia.

Moreover, an asymmetric impact emerges as lower-medium oil price shocks amplify inflation persistence in net-importing economies such as Germany, China, and Korea. There are several economic implications to this, among them is the expectation channel where when there is unanchored inflation expectation people expect inflation to persist even with a lower oil shock. Again, if the central bank's monetary response to increasing inflation is slow, even lower oil price shock can significantly lead to persistence in inflation.

Furthermore, we accounted for how currency exchange rate influences the oil price pass through to the inflation persistence. There is a heterogeneity of impact: in countries like Germany, currency depreciation exacerbates oil-driven inflation persistence, while in Asia-Pacific economies (e.g., Japan, China, and Korea), currency appreciation increases inflation persistence. The result suggests that the depreciation of currencies in oil-dependent countries raises the domestic cost of imported oil, sustaining inflation. In the case of the Asia-Pacific countries which export more goods, appreciation of their currency can weaken export competitiveness, which induces governments to adjust domestic prices to sustain economic activity, which can fuel inflation persistence. This transmission mechanism underscores the relevance of exchange rate management in mitigating the inflationary effects of oil price shocks.

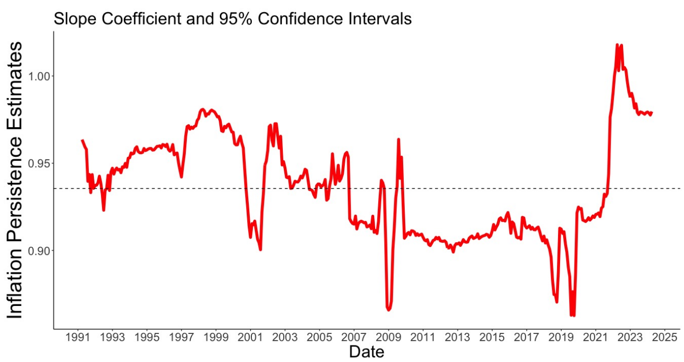
6 Conclusions and Implications

This study examines the decomposed oil-driven inflation persistence by examining how different aspects of oil price dynamics such as oil returns; cyclical components; permanent trends and oil innovations for the top 10 oil-dependent economies grouped into net-importing and net-exporting oil economies from 1980M1 to 2024M3. We apply different specifications including error-based, intrinsic inflation persistence and half-life inflation persistence.

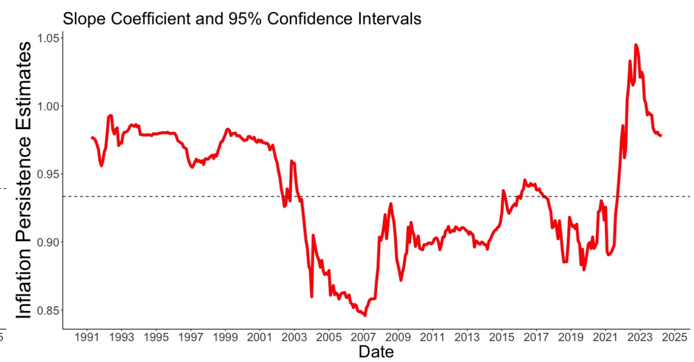
The study reveals that the oil price returns and cyclical oil price components decrease inflation persistence in net-export oil economies except for Brazil. In contrast, these short-run components of the oil price significantly increase inflation persistence in the net-import oil economies with the exception of China. Again, the study shows that the permanent oil price leads to an increase in the error-based inflation persistence in Germany and Saudi Arabia while the inverse is observed in Russia. Nevertheless, it significantly reduces the intrinsic inflation persistence.

Applying the regime-switching local projection that incorporates extreme oil price shock, exchange rate movements and intensity of geopolitical risk, this study identifies asymmetric oil price impact on inflation persistence. We observe that in extreme global geopolitical risks, inflation persistence significantly increases in reaction to oil shocks in net-importing oil economies (except Korea). The findings emphasize the significant transmission mechanisms through which these factors shape the influence of oil price dynamics on inflation persistence.

The study provides several implications for managing inflation in economies that heavily depend on oil. The study also supports the central banks with more precise and effective measures that address oil-driven inflation based on the specific component of oil price dynamics, such as cyclical oil prices or permanent oil prices. By and large, the study results guide central banks toward achieving their inflation targets and promoting a stable economy. Although our study provides robust analyses of how oil prices in domestic currency drive inflation persistence, future research can employ the domestic price of gasoline paid by consumers since the relationship between the price of oil and the price of refined products could be unstable over time.

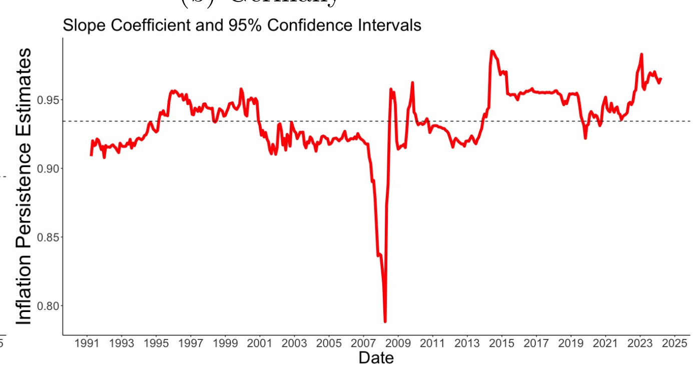


(a) United States

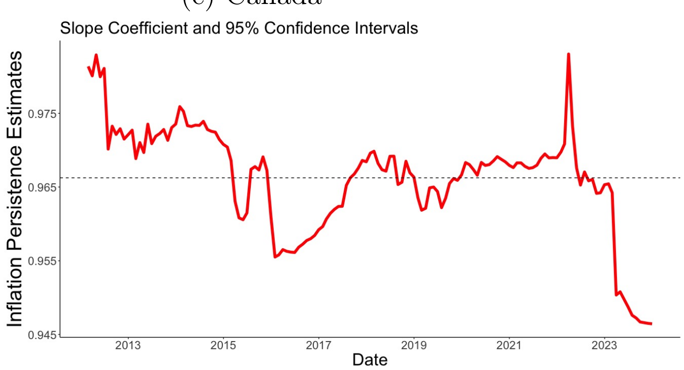


(b) Germany

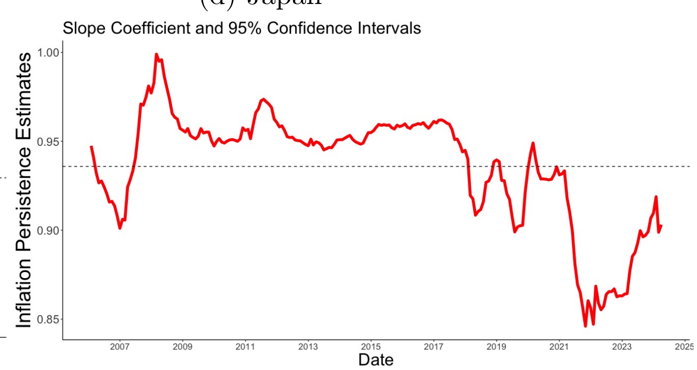
(c) Canada



(d) Japan

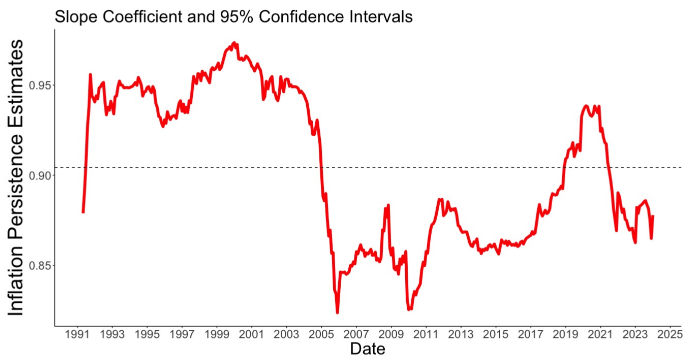


(e) Russia

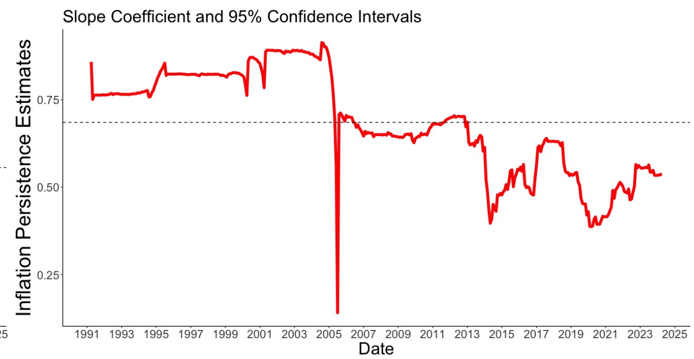


(f) China

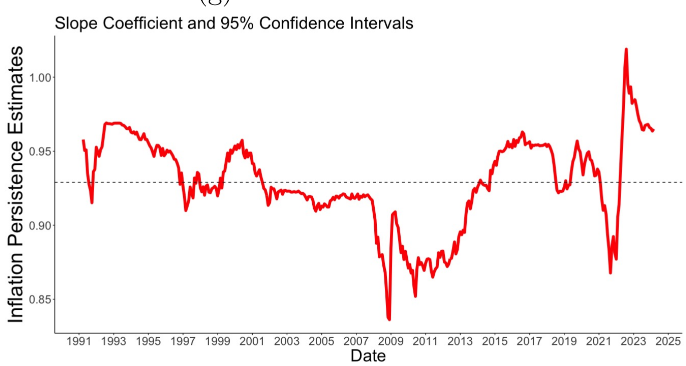
Figure 1: Time-Varying Dynamics of Cumulative Inflation Persistence



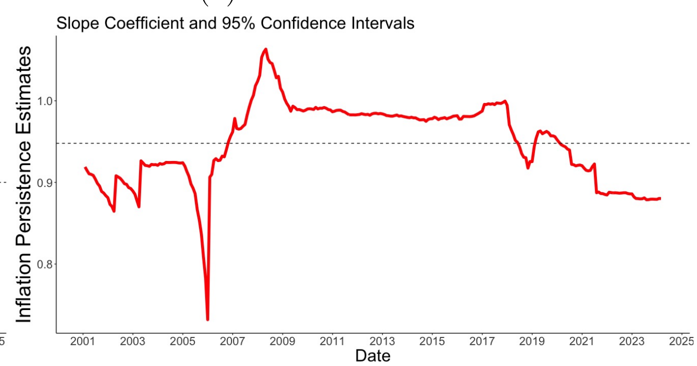
(g) India



(h) Brazil



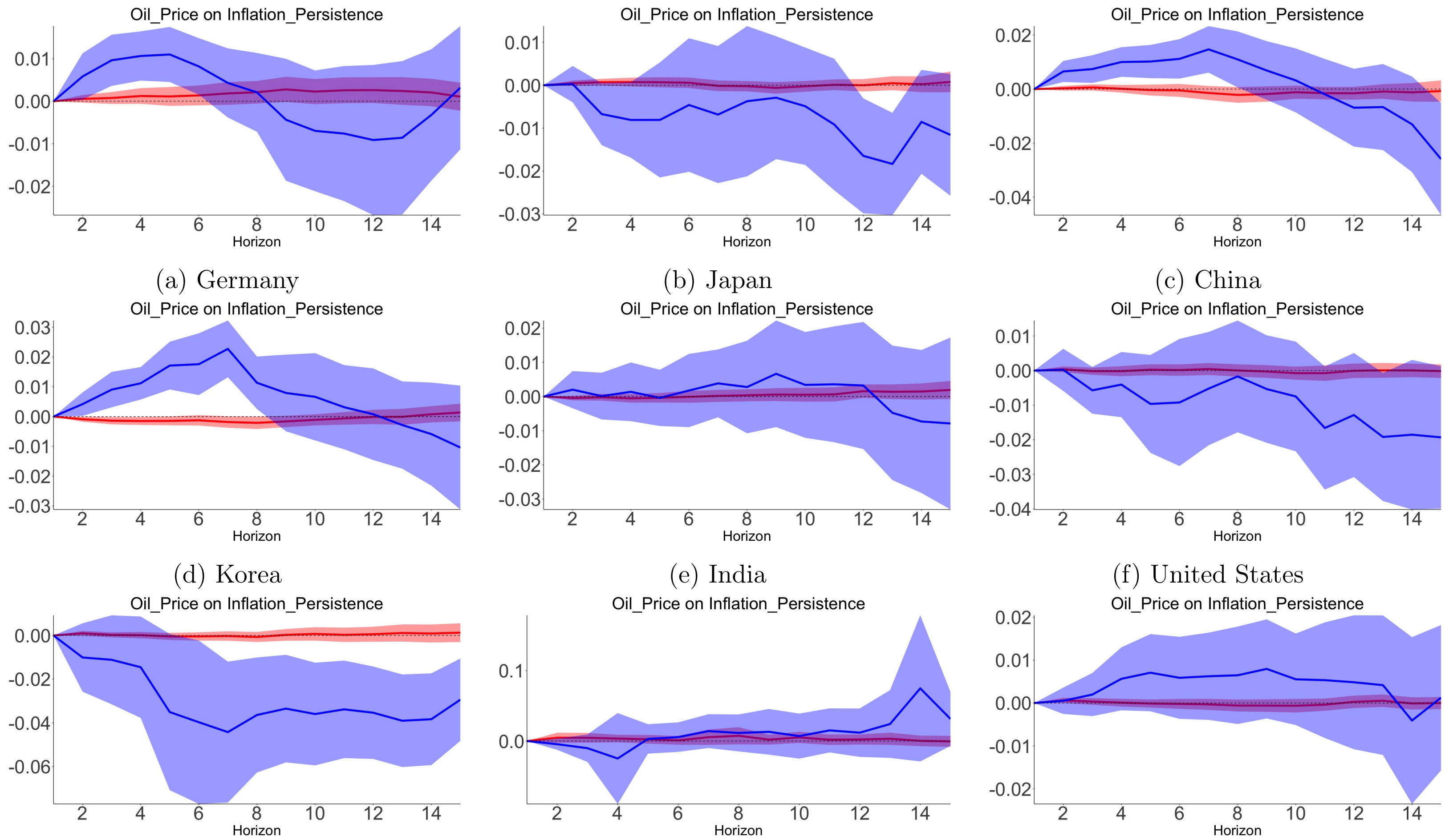
(i) Korea



(j) Saudi Arabia

Figure 1: Time-Varying Dynamics of Cumulative Inflation Persistence

Note: This figure illustrates the time-varying Dynamics of Cumulative intrinsic Inflation Persistence estimated by applying a 10-year rolling regression model.



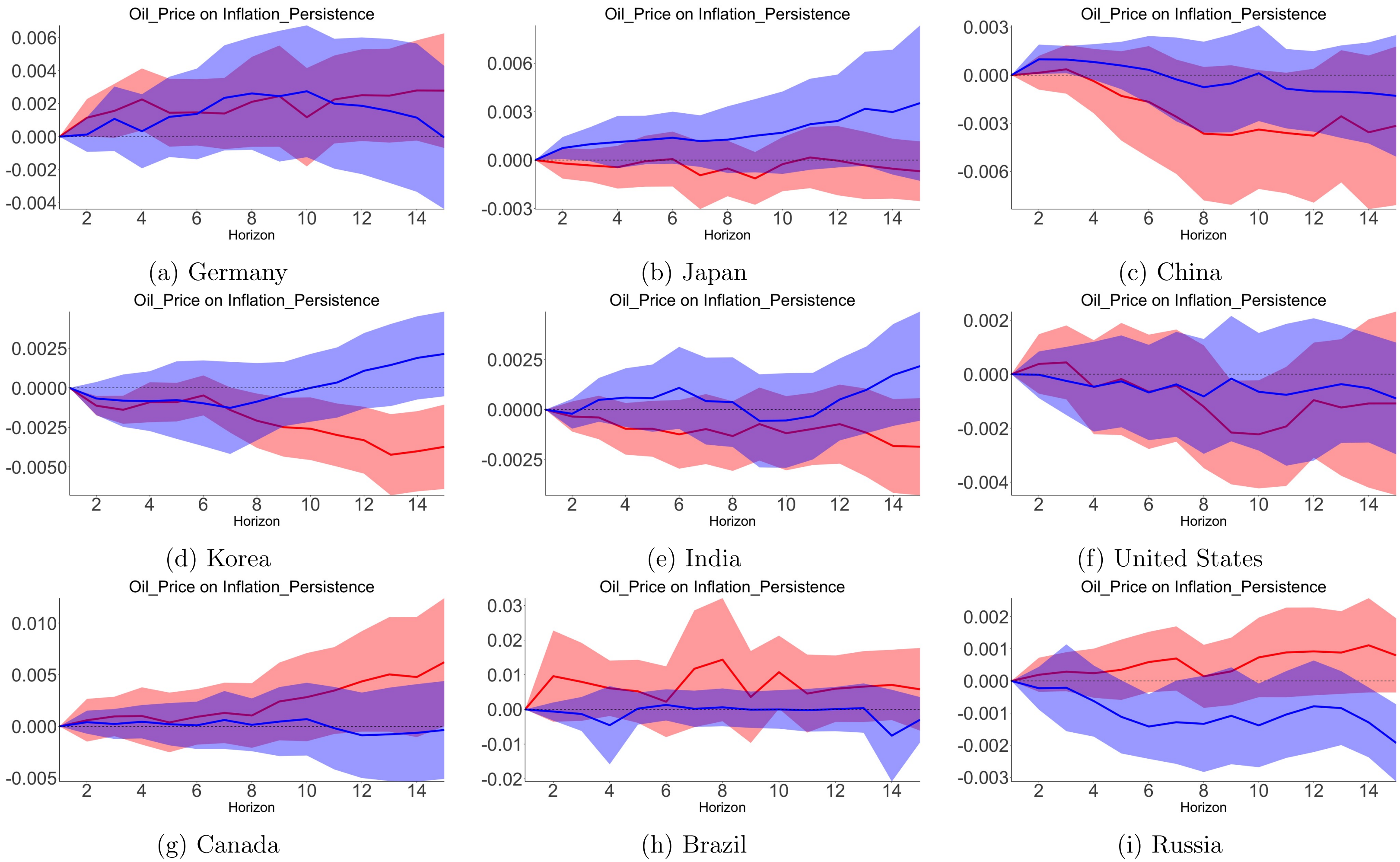
(a) Germany (b) Japan (c) China

(d) Korea (e) India (f) United States

(g) Canada (h) Brazil (i) Russia

Figure 2: Inflation Persistence's Response to Oil Price Shocks

Note: This figure presents the impact of oil price returns on intrinsic inflation persistence interacting with the extreme oil price shock (Red solid line) and low-to-medium oil price shock (Blue solid line) regimes. The shaded area represents the 95% confidence bands.



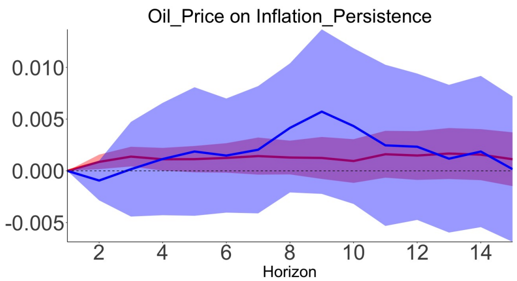
(a) Germany (b) Japan (c) China

(d) Korea (e) India (f) United States

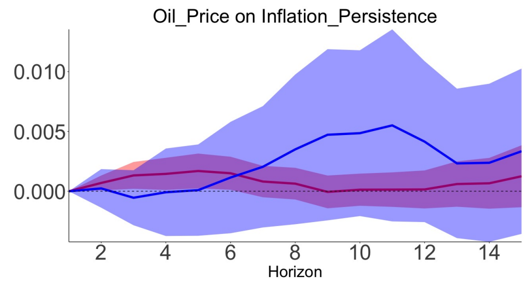
(g) Canada (h) Brazil (i) Russia

Figure 3: Inflation Persistence's Response to Oil Price Change with Domestic Currency Interaction

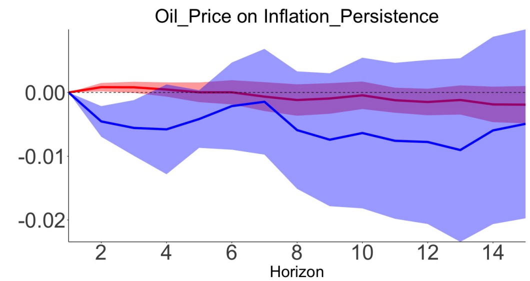
Note: This figure presents the impact of oil price returns on intrinsic inflation persistence interacting with domestic currency within a regime of domestic currency depreciation (Red solid line) and appreciation (Blue solid line). The shaded area represents the 95% confidence bands.



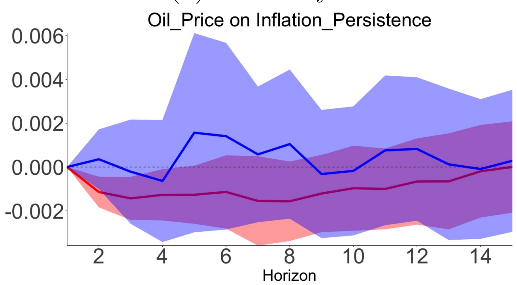
(a) Germany



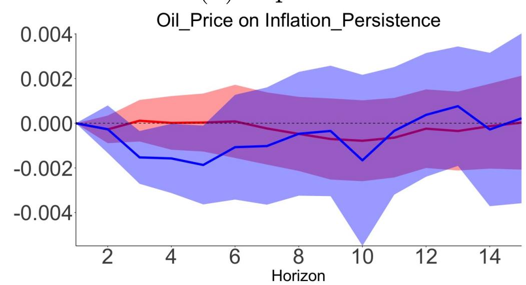
(b) Japan



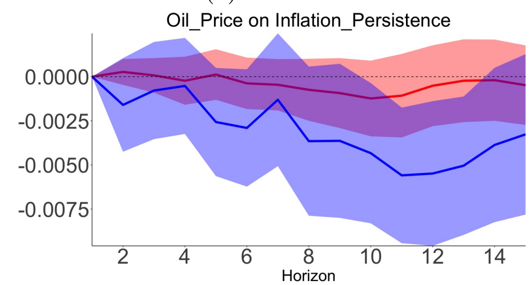
(c) China



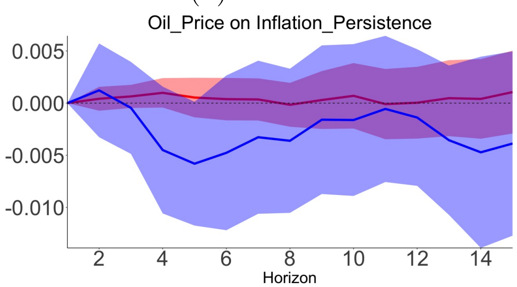
(d) Korea



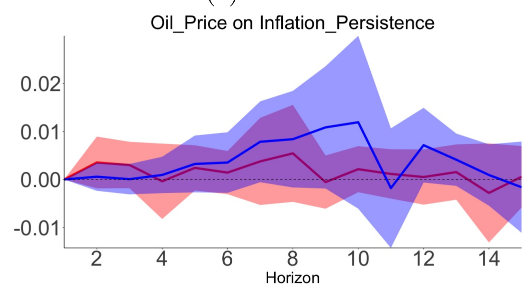
(e) India



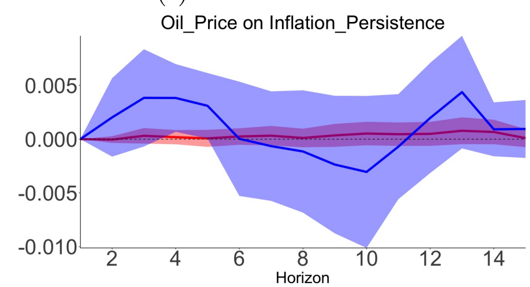
(f) United States



(g) Canada



(h) Brazil



(i) Russia

Figure 4: Inflation Persistence's Response to Oil Price Change with Geopolitical Interaction

Note: This figure presents the impact of oil price returns on intrinsic inflation persistence interacting with the intensity of geopolitical risk within a regime of extreme geopolitical intensity (Red solid line) and low-to-moderate intensity (Blue solid line). The shaded area represents the 95% confidence bands.

Table 1: Error Inflation Persistence and Oil Price Return

	First Order Persistence							
	$\epsilon_t = \beta_0 + \beta_1\epsilon_{t-1} + \beta_2 OPR_{t-l} + \beta_3(\epsilon_{t-1}OPR_{t-1}) + \beta_4 FXUS_{t-1} + \beta_5 GREA_{t-1} + \beta_6 EPU_{t-1} + \upsilon_t$							
	Net Importers							
	β_0	β_1	β_2	β_3	β_4	β_5	β_6	Adj R^2
DE	-0.0001	-0.0432	0.0064^{**}	0.3654	-0.0002	0.0003^{**}	0.0002	0.0215
	(0.0002)	(0.0628)	(0.0028)	(0.5674)	(0.0002)	(0.0001)	(0.0005)	
JP	0.0001	0.0877^{*}	0.0048^{**}	-0.1513	0.0002	0.0001	-0.0003	0.0269
	(0.0002)	(0.0457)	(0.0019)	(0.4486)	(0.0002)	(0.0002)	(0.0002)	
CN	-0.0001	0.0680	0.0111^{***}	-0.1265	-0.0002	0.0007^{*}	-0.0001	0.0517
	(0.0003)	(0.0594)	(0.0035)	(0.5918)	(0.0004)	(0.0003)	(0.0003)	
KR	-0.0001	0.0050	0.0122^{***}	-0.6045	0.0006^{**}	0.0003^{*}	-0.0003	0.0738
	(0.0002)	(0.0674)	(0.0032)	(0.8467)	(0.0003)	(0.0001)	(0.0002)	
IN	-0.0006	-0.0439	0.0065	0.0994	-0.0006	0.0007^{**}	0.0004	0.0131
	(0.0004)	(0.0589)	(0.0044)	(0.4971)	(0.0004)	(0.0003)	(0.0003)	
	Net Exporters							
US	-0.0001	-0.0985^{*}	0.0089^{***}	0.0187	-0.0002	0.0002	-0.0002	0.0526
	(0.0002)	(0.0563)	(0.0020)	(0.3150)	(0.0002)	(0.0002)	(0.0002)	
CA	-0.0001	-0.0452	0.0096^{***}	-0.0256	0.0003	0.0002	-0.0001	0.0304
	(0.0002)	(0.0456)	(0.0026)	(0.5342)	(0.0002)	(0.0002)	(0.0002)	
BR	-0.0007	-0.0976	0.0259	0.7086	0.0046	-0.0001	0.0006	0.0185
	(0.0017)	(0.1010)	(0.0185)	(1.2658)	(0.0031)	(0.0005)	(0.0013)	
RU	-0.0002	0.0691	0.0037	-0.9167^{**}	-0.0003	0.0009^{**}	0.0010	0.0414
	(0.0005)	(0.1295)	(0.0062)	(0.3737)	(0.0004)	(0.0004)	(0.0009)	
SA	-0.0001	0.0805	0.0064	-1.6814	-0.0008^{*}	-0.0009^{**}	0.0004	0.0438
	(0.0004)	(0.0723)	(0.0053)	(1.4800)	(0.0004)	(0.0003)	(0.0005)	

Note: The table reports the estimates of permanent oil price returns (OPR) impact on the error-based inflation persistence (ϵ_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table 2: Error Inflation Persistence and Cyclical Oil Shock

$\epsilon_t = \beta_0 + \beta_1\epsilon_{t-1} + \beta_2 COP_{t-l} + \beta_3(\epsilon_{t-1}COP_{t-1}) + \beta_4 FXUS_{t-1} + \beta_5 GREA_{t-1} + \beta_6 EPU_{t-1} + \upsilon_t$																
	SMA(12)								HP Trend							
	Net Importers															
	β_0	β_1	β_2	β_3	β_4	β_5	β_6	Adj R^2	β_0	β_1	β_2	β_3	β_4	β_5	β_6	Adj R^2
DE	−0.0003	−0.0809	0.0052***	0.3128	−0.0002	0.0001	0.0001	0.0565	−0.0001	−0.0307	0.0027**	0.3497	−0.0003	0.0003*	0.0001	0.0190
	(0.0002)	(0.0601)	(0.0012)	(0.2483)	(0.0002)	(0.0001)	(0.0004)		(0.0002)	(0.0538)	(0.0013)	(0.2794)	(0.0002)	(0.0001)	(0.0004)	
JP	−0.0001	0.0389	0.0044***	0.3420*	0.0001	−0.0001	−0.0002	0.0543	−0.0001	0.0263	0.0045***	0.2113	0.0001	−0.0001	−0.0002	0.0582
	(0.0002)	(0.0459)	(0.0010)	(0.1830)	(0.0002)	(0.0001)	(0.0002)		(0.0002)	(0.0461)	(0.0009)	(0.1767)	(0.0002)	(0.0001)	(0.0002)	
CN	−0.0002	0.0469	0.0060**	0.1462	−0.0004	0.0004	−0.0001	0.0508	−0.0001	0.0691	0.0035	0.1557	−0.0005	0.0006*	0.0001	0.0327
	(0.0004)	(0.0640)	(0.0025)	(0.2126)	(0.0004)	(0.0004)	(0.0003)		(0.0003)	(0.0632)	(0.0024)	(0.2070)	(0.0004)	(0.0004)	(0.0002)	
KR	−0.0001	−0.0012	0.0052***	−0.4313	0.0004	0.0001	−0.0003*	0.0510	−0.0001	−0.0022	0.0026***	−0.2366	0.0003	0.0002*	−0.0004*	0.0292
	(0.00)	(0.0630)	(0.0013)	(0.4755)	(0.0003)	(0.0001)	(0.0002)		(0.0002)	(0.0617)	(0.0013)	(0.4092)	(0.0003)	(0.0001)	(0.0002)	
IN	−0.0006*	−0.0595	0.0052**	−0.0819	−0.0007	0.0004	0.0004	0.0233	−0.0005	−0.0639	0.0047**	−0.1269	−0.0009*	0.0005*	0.0004	0.0213
	(0.0004)	(0.0560)	(0.0025)	(0.2667)	(0.0004)	(0.0003)	(0.0003)		(0.0004)	(0.0564)	(0.0023)	(0.2680)	(0.0005)	(0.0003)	(0.0003)	
	Net Exporters															
US	−0.0001	−0.0921*	0.0047***	0.1594	−0.0003	−0.0001	−0.0002	0.0580	−0.0001	−0.0054	0.0004	0.1557	−0.0003	0.0002	−0.0003	0.0099
	(0.0001)	(0.0472)	(0.0010)	(0.1603)	(0.0002)	(0.0002)	(0.0002)		(0.0002)	(0.0593)	(0.0007)	(0.1813)	(0.0002)	(0.0002)	(0.0002)	
CA	−0.0001	−0.0555	0.0055***	0.1347	0.0002	−0.0001	−0.0001	0.0357	0.0001	−0.0145	0.0022**	0.0017	0.0001	0.0001	−0.0001	0.0001
	(0.0002)	(0.0431)	(0.0013)	(0.1969)	(0.0002)	(0.0002)	(0.0002)		(0.0002)	(0.0503)	(0.0011)	(0.1892)	(0.0002)	(0.0002)	(0.0002)	
BR	−0.0001	−0.0638	−0.0065	1.6041*	0.0039	0.0002	0.0003	0.0592	−0.0002	−0.0721	−0.0091	1.6253*	0.0042	0.0002	0.0002	0.0569
	(0.0018)	(0.0724)	(0.0074)	(0.8700)	(0.0025)	(0.0006)	(0.0014)		(0.0017)	(0.0702)	(0.0077)	(0.9510)	(0.0026)	(0.0006)	(0.0014)	
RU	−0.0002	0.0730	0.0024	−0.5761**	−0.0005	0.0008*	0.0008	0.0378	−0.0002	0.0266	0.0047	−0.3652	−0.0006	0.0007*	0.0008	0.0304
	(0.0005)	(0.1389)	(0.0032)	(0.2275)	(0.0004)	(0.0004)	(0.0007)		(0.0005)	(0.1396)	(0.0037)	(0.2488)	(0.0004)	(0.0004)	(0.0008)	
SA	0.0001	0.0409	0.0009	−0.2068	−0.0008**	0.0008**	0.0004	0.0254	0.0001	0.0350	0.0024	0.2207	−0.0009***	0.0007**	0.0004	0.0289
	(0.0004)	(0.0580)	(0.0022)	(0.2224)	(0.0004)	(0.0004)	(0.0005)		(0.0005)	(0.0530)	(0.0018)	(0.1910)	(0.0003)	(0.0003)	(0.0006)	

Note: The table reports the estimates of cyclical oil price shock (COP) impact on the error-based inflation persistence (ϵ_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table 3: Error Inflation Persistence and Permanent Oil Shock

$\epsilon_t = \beta_0 + \beta_1\epsilon_{t-1} + \beta_2 POP_{t-l} + \beta_3(\epsilon_{t-1}POP_{t-1}) + \beta_4 FXUS_{t-1} + \beta_5 GREA_{t-1} + \beta_6 EPU_{t-1} + \upsilon_t$																
	SMA(12)								HP Trend							
	Net Importers															
	β_0	β_1	β_2	β_3	β_4	β_5	β_6	Adj R^2	β_0	β_1	β_2	β_3	β_4	β_5	β_6	Adj R^2
DE	−0.0002	−0.6479**	0.0001	0.1698**	−0.0002	0.0003**	0.0001	0.0102	−0.0008	0.6403**	0.0002	0.1668**	−0.0002	0.0003**	0.0001	0.0100
	(0.0009)	(0.2586)	(0.0002)	(0.0705)	(0.0002)	(0.0001)	(0.0004)		(0.0010)	(0.2668)	(0.0003)	(0.0714)	(0.0002)	(0.0001)	(0.0004)	
JP	−0.0012	−0.5678	0.0001	0.0799	0.0001	0.0001	−0.0004**	0.0177	−0.0011	−0.6115	0.0001	0.0852	0.0001	0.0001	−0.0004	0.0178
	(0.0018)	(0.4321)	(0.0002)	(0.0522)	(0.0002)	(0.0002)	(0.0002)		(0.0017)	(0.4393)	(0.0002)	(0.0532)	(0.0002)	(0.0002)	(0.0002)	
CN	−0.0016	0.6036	0.0003	−0.0895	−0.0005	0.0007**	0.0001	0.0256	−0.0038	0.7250	0.0007	−0.1105	−0.0004	0.0007*	−0.0001	0.0292
	(0.0036)	(0.6775)	(0.0006)	(0.1173)	(0.0003)	(0.0004)	(0.0003)		(0.0039)	(0.6687)	(0.0007)	(0.1153)	(0.0004)	(0.0004)	(0.0003)	
KR	0.0059	1.1164	−0.0006	−0.1053	0.0004	0.0004***	−0.0002	0.0181	0.0049	1.1696	−0.0005	−0.1099	0.0004	0.0005***	−0.0002	0.0171
	(0.0042)	(0.9870)	(0.0004)	(0.0901)	(0.0002)	(0.0002)	(0.0002)		(0.0044)	(0.9376)	(0.0004)	(0.0850)	(0.0003)	(0.0001)	(0.0002)	
IN	−0.0059	−0.1207	0.0007	0.0090	−0.0007	0.0007**	0.0002	0.0089	−0.0071	−0.0766	0.0008	0.0034	−0.0007	0.0007**	0.0002	0.0095
	(0.0050)	(0.6714)	(0.0006)	(0.0870)	(0.0005)	(0.0003)	(0.0003)		(0.0057)	(0.7409)	(0.0007)	(0.0960)	(0.0005)	(0.0003)	(0.0003)	
	Net Exporters															
US	0.0013*	−0.2102	−0.0004*	0.0512	−0.0003	0.0003*	−0.0001	0.0136	0.0003	−0.1913	−0.0001	0.0468	−0.0003	0.0003	−0.0002	0.0093
	(0.0007)	(0.3270)	(0.0002)	(0.0861)	(0.0002)	(0.0002)	(0.0002)		(0.0008)	(0.3101)	(0.0002)	(0.0822)	(0.0002)	(0.0002)	(0.0002)	
CA	0.0017	−0.1665	−0.0004	0.0438	0.0002	0.0003*	0.0001	−0.0032	0.0007	−0.2004	−0.0002	0.0525	0.0002	0.0002	0.0001	−0.0056
	(0.0015)	(0.2911)	(0.0004)	(0.0774)	(0.0002)	(0.0002)	(0.0002)		(0.0015)	(0.2956)	(0.0004)	(0.0777)	(0.0002)	(0.0002)	(0.0002)	
BR	−0.0073	0.8640	0.0015	−0.2669	0.0041	−0.0002	−0.0001	0.0143	−0.0091	0.6827	0.0019	−0.2165	0.0042	−0.0003	−0.0001	0.0136
	(0.0178)	(0.7788)	(0.0035)	(0.2046)	(0.0028)	(0.0007)	(0.0006)		(0.0194)	(0.7800)	(0.0038)	(0.2061)	(0.0028)	(0.0007)	(0.0006)	
RU	−0.0001	2.9472	−0.0001	−0.3682	−0.0005	0.0008**	0.0008	0.0162	0.0141	4.0863*	−0.0018	−0.5099*	−0.0005	0.0008*	0.0010	0.0262
	(0.0163)	(2.1381)	(0.0021)	(0.2658)	(0.0004)	(0.0004)	(0.0008)		(0.0250)	(2.3782)	(0.0032)	(0.2931)	(0.0004)	(0.0004)	(0.0009)	
SA	−0.0063**	−2.2659***	0.0012**	0.4359***	−0.0009**	0.0006**	0.0003	0.0630	−0.0068**	−2.2163***	0.0013**	0.4209***	−0.0009**	0.0006**	0.0002	0.0522
	(0.0028)	(0.4305)	(0.0005)	(0.0815)	(0.0004)	(0.0003)	(0.0006)		(0.0030)	(0.5202)	(0.0005)	(0.0990)	(0.0004)	(0.0003)	(0.0006)	

Note: The table reports the estimates of permanent oil price shock (POP) impact on the error-based inflation persistence (ϵ_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table 4: Error Inflation Persistence and Oil Price Innovation

	$\epsilon_t = \beta_0 + \beta_1\epsilon_{t-1} + \beta_2 OPI_{t-l} + \beta_3(\epsilon_{t-1}OPI_{t-1}) + \beta_4 FXUS_{t-1} + \beta_5 GREA_{t-1} + \beta_6 EPU_{t-1} + \upsilon_t$							
	Net Importers							
	β_0	β_1	β_2	β_3	β_4	β_5	β_6	Adj R^2
DE	-0.0001	-0.0353	0.0062^{**}	0.2617	-0.0002	0.0003^{**}	0.0001	0.0192
	(0.0002)	(0.0608)	(0.0025)	(0.6133)	(0.0002)	(0.0001)	(0.0005)	
JP	0.0001	0.0932^{**}	0.0051^{**}	-0.4204	0.0002	0.0002	-0.0003	0.0287
	(0.0002)	(0.0464)	(0.0020)	(0.5127)	(0.0002)	(0.0002)	(0.0002)	
CN	-0.0001	0.0757	0.0119^{***}	0.3697	-0.0002	0.0007^{*}	-0.0001	0.0488
	(0.0003)	(0.0598)	(0.0039)	(0.6610)	(0.0004)	(0.0003)	(0.0003)	
KR	-0.0001	0.0205	0.0124^{***}	-0.7192	0.0005^{**}	0.0003^{**}	-0.0003^{*}	0.0697
	(0.0002)	(0.0696)	(0.0030)	(0.7785)	(0.0003)	(0.0001)	(0.0002)	
IN	-0.0006	-0.0397	0.0081^{*}	-0.0316	-0.0006	0.0007^{**}	0.0003	0.0161
	(0.0004)	(0.0585)	(0.0046)	(0.5825)	(0.0004)	(0.0003)	(0.0003)	
	Net Exporters							
US	-0.0001	-0.0881	0.0092^{***}	-0.0382	-0.0002	0.0002	-0.0002	0.0549
	(0.0002)	(0.0556)	(0.0021)	(0.4871)	(0.0002)	(0.0002)	(0.0002)	
CA	0.0001	-0.0372	0.0094^{***}	-0.1978	0.0003	0.0002	-0.0001	0.0281
	(0.0002)	(0.0456)	(0.0028)	(0.6051)	(0.0002)	(0.0002)	(0.0002)	
BR	-0.0005	-0.0852	0.0352^{*}	-0.8087	0.0049	-0.0001	0.0006	0.0235
	(0.0017)	(0.1116)	(0.0185)	(1.8575)	(0.0032)	(0.0006)	(0.0013)	
RU	-0.0002	0.0715	0.0035	-0.8993^{**}	-0.0004	0.0009^{**}	0.0010	0.0412
	(0.0005)	(0.1287)	(0.0052)	(0.3505)	(0.0004)	(0.0004)	(0.0008)	
SA	0.0001	0.0417	0.0040	-0.3335	-0.0008^{*}	0.0008^{**}	0.0004	0.0256
	(0.0004)	(0.0618)	(0.0044)	(0.6315)	(0.0004)	(0.0003)	(0.0005)	

Note: The table reports the estimates of oil price innovation (OPI) impacts on the error-based inflation persistence (ϵ_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table 5: Error Inflation Persistence and Oil Price Decomposition: Posterior Inclusion Probability (PIP) of BMA

	Net Importers					Net Exporters				
	DE	JP	CN	KR	IN	US	CA	BR	RU	SA
Intercept	(−)1.0000	(+)1.0000	(−)1.0000	(+)1.0000	(−)1.0000	(−)1.0000	(−)1.0000	(−)1.0000	(−)1.0000	(+)1.0000
ϵ_{t-1}	(−)0.5538	(−)0.3437	(+)0.6408	(+)0.4259	(−)0.3129	(−)0.5450	(−)0.3389	(−)0.5579	(+)0.4246	(−)0.8449
OPR	(+)0.5872	(−)0.4631	(+)0.5924	(+)0.7044	(−)0.4003	(+)0.5939	(+)0.6596	(−)0.5682	(+)0.2922	(+)0.8975
COP	(+)0.7440	(+)0.9999	(+)0.3694	(+)0.6535	(+)0.6752	(+)0.2783	(+)0.4695	(−)0.4022	(+)0.7107	(+)0.2987
POP	(+)0.3133	(+)0.2730	(+)0.4860	(−)0.6735	(+)0.3926	(−)0.3743	(−)0.3128	(+)0.5496	(−)0.3929	(+)0.8743
OPI	(+)0.5334	(+)0.7336	(+)0.5599	(+)0.4996	(+)0.5474	(+)0.6163	(+)0.5279	(+)0.7718	(+)0.2916	(−)0.8462
$\epsilon_{t-1}OPR$	(+)0.2928	(+)0.3703	(−)0.8621	(−)0.3736	(+)0.3141	(−)0.2996	(+)0.2981	(+)1.0000	(−)0.5816	(−)0.7414
$\epsilon_{t-1}COP$	(+)0.4607	(+)0.3289	(+)0.3158	(−)0.3505	(−)0.2929	(+)0.2847	(+)0.3052	(+)1.0000	(+)0.4740	(+)0.3941
$\epsilon_{t-1}POP$	(+)0.5200	(+)0.3628	(−)0.5969	(−)0.4287	(−)0.3136	(+)0.4599	(−)0.3310	(−)0.5603	(−)0.4156	(+)0.8693
$\epsilon_{t-1}OPI$	(−)0.2831	(−)0.4264	(+)0.8691	(−)0.3690	(−)0.3231	(+)0.2868	(−)0.3042	(−)1.0000	(−)0.5502	(+)0.5358
FXUS	(−)0.4017	(+)0.2721	(−)0.3137	(+)0.7785	(−)0.5798	(−)0.3816	(+)0.5525	(+)0.8289	(−)0.4008	(−)0.6736
GREA	(+)0.5544	(+)0.2723	(+)0.7519	(+)0.5178	(+)0.5798	(+)0.5877	(+)0.3403	(−)0.2766	(+)0.7970	(+)0.4971
EPU	(+)0.2910	(−)0.4020	(−)0.2784	(−)0.3738	(+)0.3090	(−)0.4714	(−)0.2756	(−)0.2859	(+)0.8188	(+)0.3159

Note: The table presents the Posterior Inclusion Probability (PIP) of the Bayesian Model Averaging (BMA). PIP indicators between 0.500 and 0.750 (weak) and greater than 0.750 (very strong). The sign in the bracket represents the direction of the oil impact: (+) is the positive mean impact and (-) denotes the negative mean impact.

Table 6: Intrinsic Inflation Persistence and Oil Price Return

	Net Importers					
	$\rho_t = \beta_0 + \beta_1 OPR_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t$					
	β_0	β_1	β_2	β_3	β_4	Adj R^2
DE	0.9314^{***}	0.0282	0.0016	-0.0117^{***}	0.0136^{***}	0.2124
	(0.0051)	(0.0279)	(0.0022)	(0.0034)	(0.0048)	
JP	0.9349^{***}	0.0100	0.0028^{**}	-0.0105^{***}	-0.0015	0.2484
	(0.0023)	(0.0100)	(0.0013)	(0.0035)	(0.0016)	
CN	0.9406^{***}	-0.0165	-0.0045^{*}	-0.0035	-0.0181^{***}	0.3271
	(0.0026)	(0.0225)	(0.0027)	(0.0026)	(0.0032)	
KR	0.9295^{***}	0.0006	-0.0003	-0.0101^{***}	-0.0010	0.1278
	(0.0035)	(0.0177)	(0.0024)	(0.0024)	(0.0035)	
IN	0.8969^{***}	0.0141	-0.0005	-0.0081^{**}	-0.0047	0.0468
	(0.0051)	(0.0269)	(0.0029)	(0.0036)	(0.0032)	
	Net Exporters					
US	0.9358^{***}	0.0194	0.0004	-0.0006	-0.0061^{**}	0.0417
	(0.0038)	(0.0230)	(0.0023)	(0.0029)	(0.0029)	
CA	0.8969^{***}	0.0414	0.0037	-0.0182^{***}	-0.0141^{**}	0.1069
	(0.0079)	(0.0453)	(0.0043)	(0.0063)	(0.0058)	
BR	0.6854^{***}	0.0375	-0.0091	-0.0010	-0.0757^{***}	0.2696
	(0.0156)	(0.0816)	(0.0077)	(0.0122)	(0.0161)	
RU	0.9686^{***}	-0.0013	-0.0001	0.0022^{***}	-0.0015^{**}	0.0628
	(0.0007)	(0.0079)	(0.0007)	(0.0006)	(0.0006)	
SA	0.9494^{***}	-0.0329	-0.0009	-0.0015	-0.0089^{*}	0.0186
	(0.0057)	(0.0335)	(0.0039)	(0.0053)	(0.0049)	

Note: The table reports the estimates of permanent oil price returns (OPR) impact on the intrinsic inflation persistence (ρ_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table 7: Intrinsic Inflation Persistence and Cyclical Oil Shock

$\rho_t = \beta_0 + \beta_1 COP_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t$

	SMA(12)						HP Trend					
Net Importers												
	β_0	β_1	β_2	β_3	β_4	Adj R^2	β_0	β_1	β_2	β_3	β_4	Adj R^2
DE	0.9306***	0.0400*	0.0012	−0.0141***	0.0132***	0.2336	0.9316***	0.0354	0.0002	−0.0130***	0.0132***	0.2299
	(0.0050)	(0.0241)	(0.0021)	(0.0034)	(0.0046)		(0.0050)	(0.0253)	(0.0022)	(0.0032)	(0.0043)	
JP	0.9343***	0.0261***	0.0028**	−0.0120***	−0.0006	0.2864	0.9350***	0.0183*	0.0022*	−0.0112***	−0.0010	0.2667
	(0.0023)	(0.0074)	(0.0013)	(0.0035)	(0.0016)		(0.0023)	(0.0097)	(0.0013)	(0.0034)	(0.0016)	
CN	0.9406***	−0.0180	−0.0043*	−0.0023	−0.0176	0.3358	0.9406***	−0.0100	−0.0037	−0.0031	−0.0181***	0.3285
	(0.0026)	(0.0120)	(0.0025)	(0.0028)	(0.0031)		(0.0026)	(0.0125)	(0.0024)	(0.0027)	(0.0032)	
KR	0.9295***	−0.0012	−0.0004	−0.0100***	−0.0010	0.1279	0.9295***	0.0088	−0.0006	−0.0104***	−0.0010	0.1300
	(0.0034)	(0.0175)	(0.0025)	(0.0027)	(0.0034)		(0.0035)	(0.0171)	(0.0023)	(0.0025)	(0.0034)	
IN	0.8963***	0.0297**	−0.0005	−0.0099***	−0.0042**	0.0606	0.8969***	−0.0036	−0.0007	−0.0079***	−0.0049***	0.0461
	(0.0023)	(0.0130)	(0.0024)	(0.0018)	(0.0018)		(0.0023)	(0.0131)	(0.0025)	(0.0018)	(0.0018)	
Net Exporters												
US	0.9357***	0.0148	0.0002	−0.0015	−0.0059*	0.0455	0.9359***	−0.0095	0.0001	−0.0001	−0.0066*	0.0417
	(0.0038)	(0.0214)	(0.0022)	(0.0029)	(0.0030)		(0.0038)	(0.0244)	(0.0021)	(0.0028)	(0.0034)	
CA	0.8959***	0.0651	0.0036	−0.0216***	−0.0137**	0.1303	0.8973***	0.0401	0.0022	−0.0195***	−0.0138**	0.1145
	(0.0080)	(0.0477)	(0.0043)	(0.0065)	(0.0057)		(0.0079)	(0.0459)	(0.0043)	(0.0062)	(0.0060)	
BR	0.6849***	0.0309	−0.0093	−0.0019	−0.0753***	0.2703	0.6854***	−0.0664	−0.0084	0.0013	−0.0771***	0.2742
	(0.0154)	(0.0744)	(0.0079)	(0.0012)	(0.0163)		(0.0156)	(0.0825)	(0.0077)	(0.0126)	(0.0163)	
RU	0.9694***	−0.0072	−0.0001	0.0030***	−0.0017**	0.0813	0.9682***	0.0040	−0.0002	0.0018***	−0.0013*	0.0687
	(0.0008)	(0.0052)	(0.0006)	(0.0008)	(0.0007)		(0.0007)	(0.0049)	(0.0007)	(0.0007)	(0.0007)	
SA	0.9496***	−0.0445**	−0.0008	0.0018	−0.0085*	0.0412	0.9494***	0.0052	−0.0001	−0.0020	−0.0088*	0.0153
	(0.0056)	(0.0206)	(0.0039)	(0.0055)	(0.0048)		(0.0057)	(0.0251)	(0.0041)	(0.0048)	(0.0050)	

Note: The table reports the estimates of cyclical oil price shock (COP) impact on the intrinsic inflation persistence (ρ_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table 8: Intrinsic Inflation Persistence and Permanent Oil Shock

$$\rho_t = \beta_0 + \beta_1 POP_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t$$

	SMA(12)						HP Trend					
Net Importers												
	β_0	β_1	β_2	β_3	β_4	Adj R^2	β_0	β_1	β_2	β_3	β_4	Adj R^2
DE	1.1010***	−0.0476***	0.0015	−0.0091***	0.0295***	0.6344	1.1208***	−0.0528***	−0.0001	−0.0076***	0.0312***	0.6792
	(0.0119)	(0.0034)	(0.0015)	(0.0032)	(0.0038)		(0.0107)	(0.0031)	(0.0013)	(0.0029)	(0.0032)	
JP	0.8959***	0.0047	0.0026**	−0.0108***	−0.0022	0.2738	0.8917***	0.0052*	0.0027**	−0.0110***	−0.0023	0.2788
	(0.0241)	(0.0030)	(0.0012)	(0.0035)	(0.0016)		(0.0242)	(0.0030)	(0.0012)	(0.0035)	(0.0016)	
CN	1.0192***	−0.0128**	−0.0034	−0.0031	−0.0192***	0.3369	1.0998***	−0.0258**	−0.0039	−0.0020	−0.0197***	0.3554
	(0.0581)	(0.0095)	(0.0025)	(0.0028)	(0.0031)		(0.0615)	(0.0100)	(0.0024)	(0.0028)	(0.0032)	
KR	1.1557***	−0.0211***	−0.0002	−0.0088***	0.0071**	0.2936	1.1790***	−0.0232***	−0.0008	−0.0080***	0.0078**	0.3168
	(0.0509)	(0.0049)	(0.0023)	(0.0022)	(0.0030)		(0.0513)	(0.0049)	(0.0023)	(0.0022)	(0.0031)	
IN	1.4014***	−0.0643***	0.0007	−0.0042*	0.0041**	0.6513	1.4628***	−0.0719***	−0.0018	−0.0024	0.0044**	0.6826
	(0.0329)	(0.0042)	(0.0016)	(0.0025)	(0.0021)		(0.0417)	(0.0053)	(0.0016)	(0.0023)	(0.0022)	
Net Exporters												
US	1.0164***	−0.0218***	0.0010	0.0018	−0.0014	0.2444	1.0177***	−0.0220***	0.0001	0.0024	−0.0011	0.2299
	(0.0154)	(0.0047)	(0.0020)	(0.0022)	(0.0022)		(0.0164)	(0.0048)	(0.0021)	(0.0022)	(0.0023)	
CA	1.1601***	−0.0678***	0.0046	−0.0094**	0.0072	0.4545	1.1794***	−0.0723***	0.0024	−0.0074*	0.0088*	0.4679
	(0.0392)	(0.0109)	(0.0038)	(0.0041)	(0.0054)		(0.0384)	(0.01056)	(0.0039)	(0.0041)	(0.0052)	
BR	1.2457***	−0.1222***	−0.0080	0.0200*	−0.0311***	0.5435	1.2529***	−0.1231***	−0.0115*	0.0204*	−0.0300***	0.5313
	(0.0573)	(0.0131)	(0.0064)	(0.0108)	(0.0103)		(0.0633)	(0.0145)	(0.0063)	(0.0113)	(0.0101)	
RU	0.9549***	0.0017	−0.0001	0.0021***	−0.0016**	0.0649	1.0138***	−0.0057	0.0001	0.0024***	−0.0012*	0.0784
	(0.0256)	(0.0033)	(0.0007)	(0.0006)	(0.0006)		(0.0427)	(0.0054)	(0.0006)	(0.0006)	(0.0006)	
SA	0.6649***	0.0526***	−0.0041	−0.0035	−0.0122**	0.2203	0.6390***	0.0572***	−0.0018	−0.0055	−0.0132***	0.2003
	(0.0483)	(0.0089)	(0.0036)	(0.0041)	(0.0050)		(0.0461)	(0.0086)	(0.0036)	(0.0043)	(0.0050)	

Note: The table reports the estimates of permanent oil price shock (POP) impact on the intrinsic inflation persistence (ρ_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table 9: Intrinsic Inflation Persistence and Oil Price Innovation

	$\rho_t = \beta_0 + \beta_1 OPI_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t$					
			Net Importers			
	β_0	β_1	β_2	β_3	β_4	Adj R^2
DE	0.9315***	−0.0046	0.0014	−0.0115***	0.0134***	0.2093
	(0.0051)	(0.0251)	(0.0022)	(0.0034)	(0.0049)	
JP	0.9350***	0.0053	0.0028**	−0.0105***	−0.0016	0.2472
	(0.0023)	(0.0081)	(0.0013)	(0.0035)	(0.0016)	
CN	0.9407***	−0.0191	−0.0045*	−0.0036	−0.0181***	0.3275
	(0.0026)	(0.0225)	(0.0026)	(0.0026)	(0.0032)	
KR	0.9295***	−0.0068	−0.0004	−0.0100***	−0.0010	0.1282
	(0.0024)	(0.0156)	(0.0023)	(0.0018)	(0.0026)	
IN	0.8969***	−0.0067	−0.0009	−0.0080**	−0.0049	0.0461
	(0.0051)	(0.0228)	(0.0029)	(0.0036)	(0.0032)	
			Net Exporters			
US	0.9359***	0.0021	−0.0001	−0.0005	−0.0063**	0.0388
	(0.0038)	(0.0182)	(0.0023)	(0.0029)	(0.0029)	
CA	0.8971***	−0.0014	0.0031	−0.0179***	−0.0143**	0.1040
	(0.0079)	(0.0364)	(0.0045)	(0.0064)	(0.0058)	
BR	0.6856***	−0.0048	−0.0097	−0.0008	−0.0757***	0.2691
	(0.0156)	(0.0725)	(0.0078)	(0.0122)	(0.0161)	
RU	0.9686***	−0.0001	0.0001	0.0022***	−0.0015**	0.0626
	(0.0007)	(0.0079)	(0.0007)	(0.0006)	(0.0006)	
SA	0.9494***	−0.0127	−0.0003	−0.0017	−0.0088*	0.0154
	(0.0057)	(0.0294)	(0.0040)	(0.0053)	(0.0050)	

Note: The table reports the estimates of oil price innovation (OPI) impacts on the intrinsic inflation persistence (ρ_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table 10: Intrinsic Inflation Persistence and Oil Price Decomposition: Posterior Inclusion Probability (PIP) of BMA

	Net Importers					Net Exporters				
	DE	JP	CN	KR	IN	US	CA	BR	RU	SA
Intercept	(+)1.0000	(+)1.0000	(+)1.0000	(+)1.0000	(+)1.0000	(+)1.0000	(+)1.0000	(+)1.0000	(+)1.0000	(+)1.0000
OPR	(+)0.3902	(+)0.3274	(−)0.3320	(−)0.2733	(+)0.3130	(+)0.5839	(+)0.3258	(+)0.3382	(−)0.3009	(−)0.3907
COP	(+)1.0000	(+)0.9752	(−)0.4165	(+)0.4502	(+)0.6491	(+)0.2793	(+)0.9999	(−)0.3289	(+)0.5308	(−)0.3096
POP	(−)1.0000	(+)0.9985	(−)0.9907	(−)1.0000	(−)1.0000	(−)1.0000	(−)1.0000	(−)1.0000	(−)0.6646	(+)1.0000
OPI	(−)0.3326	(−)0.3243	(−)0.3038	(+)0.2740	(−)0.2919	(−)0.4223	(−)0.3000	(+)0.3168	(+)0.2971	(+)0.3315
FXUS	(−)0.4226	(+)0.7678	(−)0.7736	(−)0.3272	(−)0.5126	(+)0.2913	(+)0.2883	(−)0.7691	(−)0.2751	(−)0.3432
GREA	(−)1.0000	(−)1.0000	(−)0.4231	(−)1.0000	(−)0.8691	(+)0.7098	(−)0.9997	(+)0.9995	(+)0.8954	(−)0.8223
EPU	(+)1.0000	(−)0.5304	(−)1.0000	(+)1.0000	(+)0.9839	(−)0.3456	(+)0.9986	(−)1.0000	(−)0.6867	(−)0.9998

Note: The table presents the Posterior Inclusion Probability (PIP) of the Bayesian Model Averaging (BMA). PIP indicators between 0.500 and 0.750 (weak) and greater than 0.750 (very strong). The sign in the bracket represents the direction of the oil impact: (+) is the positive mean impact and (-) denotes the negative mean impact.

References

Ahmed, M. I. & Cassou, S. P. (2016), 'Does consumer confidence affect durable goods spending during bad and good economic times equally?', *Journal of Macroeconomics* **50**, 86–97.

Andrews, D. W. & Chen, H.-Y. (1994), 'Approximately median-unbiased estimation of autoregressive models', *Journal of Business & Economic Statistics* **12**(2), 187–204.

Anyars, S. I. & Adabor, O. (2023), 'The impact of oil price changes on inflation and disaggregated inflation: Insights from ghana', *Research in Globalization* **6**, 100125.

Ascari, G. & Sbordone, A. M. (2014), 'The macroeconomics of trend inflation', *Journal of Economic Literature* **52**(3), 679–739.

Baker, S. R., Bloom, N. & Davis, S. J. (2016), 'Measuring economic policy uncertainty', *The quarterly journal of economics* **131**(4), 1593–1636.

Baumeister, C. & Kilian, L. (2016), 'Lower oil prices and the us economy: Is this time different?', *Brookings Papers on Economic Activity* **2016**(2), 287–357.

Bems, R., Caselli, F., Grigoli, F. & Gruss, B. (2021), 'Expectations' anchoring and inflation persistence', *Journal of International Economics* **132**, 103516.

Bernanke, B. & Blanchard, O. (2024), 'An analysis of pandemic-era inflation in 11 economies', *Peterson Institute for International Economics Working Paper* pp. 24–11.

Bernanke, B. S. (2007), Inflation expectations and inflation forecasting, *in* 'Speech at the Monetary Economics Workshop of the National Bureau of Economic Research Summer Institute, Cambridge, Massachusetts', Vol. 10, p. 11.

Bianchi, F., Faccini, R. & Melosi, L. (2023), 'A fiscal theory of persistent inflation', *The Quarterly Journal of Economics* **138**(4), 2127–2179.

Bilke, L. & Stracca, L. (2007), 'A persistence-weighted measure of core inflation in the euro area', *Economic Modelling* **24**(6), 1032–1047.

Blanchard, O. J. & Gali, J. (2007), 'The macroeconomic effects of oil shocks: Why are the 2000s so different from the 1970s?'.

Bleaney, M. (2000), 'Exchange rate regimes and inflation persistence', *IMF Staff papers* **47**(3), 387–402.

Burdekin, R. C. & Siklos, P. L. (1999), ‘Exchange rate regimes and shifts in inflation persistence: does nothing else matter?’, *Journal of Money, Credit, and Banking* pp. 235–247.

Caldara, D. & Iacoviello, M. (2022), ‘Measuring geopolitical risk’, *American Economic Review* **112**(4), 1194–1225.

Cheikh, N. B., Zaied, Y. B. & Mattoussi, W. (2023), ‘Oil price shocks in the age of surging inflation’, *Energy Economics* **128**, 107128.

Cloyne, J., Jordà, Ò. & Taylor, A. M. (2023), State-dependent local projections: Understanding impulse response heterogeneity, Technical report, National Bureau of Economic Research.

Cogley, T., Primiceri, G. E. & Sargent, T. J. (2010), ‘Inflation-gap persistence in the us’, *American Economic Journal: Macroeconomics* **2**(1), 43–69.

Conflitti, C. & Luciani, M. (2019), ‘Oil price pass-through into core inflation’, *The Energy Journal* **40**(6), 221–248.

Cutler, J. (2001), Core inflation in the uk, Technical report, External MPC Unit Discussion Paper.

Demarco, A. (2004), ‘A new measure of core inflation for malta’, *Central Bank of Malta Quarterly Review* **2**.

Fuhrer, J. C. (2010), Inflation persistence, *in* ‘Handbook of monetary economics’, Vol. 3, Elsevier, pp. 423–486.

Gaglianone, W. P., de Carvalho Guillén, O. T. & Figueiredo, F. M. R. (2018), ‘Estimating inflation persistence by quantile autoregression with quantile-specific unit roots’, *Economic Modelling* **73**, 407–430.

Gagliardone, L. & Gertler, M. (2023), ‘Oil prices, monetary policy and inflation surges’.

Garzon, A. J. & Hierro, L. A. (2021), ‘Asymmetries in the transmission of oil price shocks to inflation in the eurozone’, *Economic Modelling* **105**, 105665.

Geronikolaou, G., Spyromitros, E. & Tsintzos, P. (2020), ‘Progressive taxation and human capital as determinants of inflation persistence’, *Economic Modelling* **88**, 82–97.

Giannellis, N. & Koukouritakis, M. (2013), ‘Exchange rate misalignment and inflation rate persistence: Evidence from latin american countries’, *International Review of Economics & Finance* **25**, 202–218.

Hoeting, J. A., Madigan, D., Raftery, A. E. & Volinsky, C. T. (1999), 'Bayesian model averaging: a tutorial (with comments by m. clyde, david draper and ei george, and a rejoinder by the authors', *Statistical science* **14**(4), 382–417.

Jiranyakul, K. (2019), 'Oil price shocks and domestic inflation in thailand', *Available at SSRN 2578836* .

Jordà, Ò. (2005), 'Estimation and inference of impulse responses by local projections', *American economic review* **95**(1), 161–182.

Kamber, G. & Wong, B. (2020), 'Global factors and trend inflation', *Journal of International Economics* **122**, 103265.

Kaufman, P. J. (2013), *Trading Systems and Methods,+ Website*, Vol. 591, John Wiley & Sons.

Kilian, L. (2009), 'Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market', *American economic review* **99**(3), 1053–1069.

Kilian, L. (2010), Oil price volatility: Origins and effects, Technical report, WTO Staff Working Paper.

Kilian, L. & Zhou, X. (2022), 'Oil prices, gasoline prices, and inflation expectations', *Journal of Applied Econometrics* **37**(5), 867–881.

Kilian, L. & Zhou, X. (2023*a*), 'A broader perspective on the inflationary effects of energy price shocks', *Energy Economics* **125**, 106893.

Kilian, L. & Zhou, X. (2023*b*), 'Oil price shocks and inflation'.

Kuralbayeva, K. (2011), 'Inflation persistence and exchange rate regime: Implications for dynamic adjustment to shocks in a small open economy', *Journal of Macroeconomics* **33**(2), 193–205.

Li, Y. & Guo, J. (2022), 'The asymmetric impacts of oil price and shocks on inflation in brics: a multiple threshold nonlinear ardl model', *Applied Economics* **54**(12), 1377–1395.

Majchrowska, A. (2022), 'Does the minimum wage affect inflation?', *Ekonomista* (4), 417–436.

Marques, C. R. et al. (2004), *Inflation persistence: facts or artefacts?*, Vol. 371, European Central Bank.

Mignon, V. & Saadaoui, J. (2024), 'How do political tensions and geopolitical risks impact oil prices?', *Energy Economics* **129**, 107219.

Moshiri, S. (2015), 'Asymmetric effects of oil price shocks in oil-exporting countries: the role of institutions', *OPEC Energy Review* **39**(2), 222–246.

Murray, C. J. & Papell, D. H. (2002), 'The purchasing power parity persistence paradigm', *Journal of International Economics* **56**(1), 1–19.

Nasir, M. A., Huynh, T. L. D. & Yarovaya, L. (2020), 'Inflation targeting & implications of oil shocks for inflation expectations in oil-importing and exporting economies: Evidence from three nordic kingdoms', *International Review of Financial Analysis* **72**, 101558.

Nasir, M. A., Naidoo, L., Shahbaz, M. & Amoo, N. (2018), 'Implications of oil prices shocks for the major emerging economies: A comparative analysis of brics', *Energy Economics* **76**, 76–88.

Niemann, S., Pichler, P. & Sorger, G. (2013), 'Public debt, discretionary policy, and inflation persistence', *Journal of Economic Dynamics and Control* **37**(6), 1097–1109.

Oloko, T. F., Ogbonna, A. E., Adedeji, A. A. & Lakhani, N. (2021), 'Oil price shocks and inflation rate persistence: A fractional cointegration var approach', *Economic Analysis and Policy* **70**, 259–275.

Prasad, M. E. & Keane, M. M. P. (1995), *The employment and wage effects of oil price changes: a sectoral analysis*, International Monetary Fund.

Raftery, A. E., Madigan, D. & Hoeting, J. A. (1997), 'Bayesian model averaging for linear regression models', *Journal of the American Statistical Association* **92**(437), 179–191.

Ramey, V. A. & Zubairy, S. (2018), 'Government spending multipliers in good times and in bad: evidence from us historical data', *Journal of political economy* **126**(2), 850–901.

Rossi, B. (2005), 'Confidence intervals for half-life deviations from purchasing power parity', *Journal of Business & Economic Statistics* **23**(4), 432–442.

Sadorsky, P. (2006), 'Modeling and forecasting petroleum futures volatility', *Energy economics* **28**(4), 467–488.

Salisu, A. A., Isah, K. O., Oyewole, O. J. & Akanni, L. O. (2017), 'Modelling oil price-inflation nexus: The role of asymmetries', *Energy* **125**, 97–106.

Sek, S. K., Teo, X. Q. & Wong, Y. N. (2015), 'A comparative study on the effects of oil price changes on inflation', *Procedia Economics and Finance* **26**, 630–636.

Wen, F., Zhang, K. & Gong, X. (2021), 'The effects of oil price shocks on inflation in the g7 countries', *The North American Journal of Economics and Finance* **57**, 101391.

Williams, J. C. (2006), The phillips curve in an era of well-anchored inflation expectations, Technical report, unpublished working paper, Federal Reserve Bank of San Francisco, September.

Zhao, L., Zhang, X., Wang, S. & Xu, S. (2016), 'The effects of oil price shocks on output and inflation in china', *Energy Economics* **53**, 101–110.

Appendix

Appendix A: Descriptive Statistics

Table A.1: Descriptive Statistics

	Mean	Std. Dev.	Min	Max	ADF Test Level	ADF Test $1^{st} Diff$		Mean	Std. Dev.	Min	Max	ADF Test Level	ADF Test $1^{st} Diff$
GPR	101.2799	47.6517	39.05	512.53	-8.633^{***}	-22.061^{***}	GREA	0.4975	55.4125	-161.4209	189.3484	-3.051^{***}	-19.039^{***}
FXUS	0.00007	0.0157	-0.0485	0.0625	-16.059^{***}	-30.020^{***}							
United States							**Germany**						
Inflation	3.0425	1.9054	-2.1195	11.7667	-4.355^{***}	-14.245^{***}		2.1588	1.6933	-1.0017	8.4532	-2.876^{**}	-21.600^{***}
EPU	123.4717	57.1078	44.7827	503.9633	-7.716^{***}	-28.934^{***}		171.8511	49.3878	28.4339	844.8547	-3.768^{***}	-25.235^{***}
Oil Price	0.0015	0.0861	-0.5049	0.4319	-16.718^{***}	-30.392^{***}		0.0024	0.088	-0.5233	0.3955	-16.981^{***}	-30.707^{***}
Exchange rate								0.8396	0.1298	0.6114	1.3028	-2.142	-17.295^{***}
Canada							**Japan**						
Inflation	2.9582	2.3694	-0.9544	12.1229	-3.676^{***}	-20.147^{***}		0.8635	1.4542	-2.5922	7.1361	-4.529^{***}	-22.782^{***}
EPU	154.3391	103.7732	28.5368	678.8171	-6.036^{***}	-32.065^{***}		102.8793	33.0713	45.9893	239.0214	-7.286^{***}	-25.622^{***}
Oil price	0.0019	0.0829	-0.4529	0.4291	-17.017^{***}	-30.371^{***}		0.0025	0.0926	-0.5306	0.4260	-16.515^{***}	-30.391
Exchange rate	1.222	0.1428	0.9605	1.5531	-1.202	-18.255^{***}		104.946	26.488	57.7035	199.289	0.555	-16.927^{***}
Russia							**China**						
Inflation	8.4584	3.8433	2.1521	17.4247	-2.534	-10.256^{***}		2.0566	2.2911	-2.2284	9.3490	-3.244^{***}	-16.526^{***}
EPU	178.2167	150.5670	12.3987	964.8407	-7.021^{***}	-32.874^{***}		151.6195	116.4832	10.1113	661.8281	-5.625^{***}	-27.517^{***}
Oil price	0.0028	0.088	-0.3615	0.3912	-13.411^{***}	-23.870^{***}		0.0040	0.0904	-0.4914	0.3049	-13.782^{***}	-25.591^{***}
Exchange rate	1.1033	10.0157	26.5743	66.2869	-2.409	-13.511^{***}		7.1814	0.9055	5.7332	8.7115	-1.050	-11.818^{***}
India							**Brazil**						
Inflation	6.2112	2.7509	-0.7101	15.9783	-4.092^{***}	-17.087^{***}		-0.1261	7.6443	-48.8324	53.4996	-6.372^{***}	-19.986^{***}
EPU	89.7802	44.4249	23.35276	283.6891	-7.568^{***}	-25.991^{***}		138.1660	87.0334	12.6899	676.9550	-7.808^{***}	-26.516^{***}
Oil price	0.0032	0.0874	-0.4624	0.4323	-17.050^{***}	-30.618^{***}		0.0025	0.0875	-0.390	0.3963	-17.880^{***}	-31.447^{***}
Exchange rate	46.554	11.089	19.575	64.3745	-2.182	-19.271^{***}		2.24	0.6848	1.4397	5.0732	-1.497	-17.026^{***}
South Korea							**Saudi Arabia**						
Inflation	3.8895	3.2986	-0.4309	25.2795	-7.671^{***}	-17.307^{***}		1.8844	2.6345	-3.8291	10.5076	-3.119^{***}	-19.161^{***}
EPU	126.1357	75.1996	22.4275	533.1768	-6.665^{***}	-25.622^{***}		140.7201	75.0318	49.2245	431.5649	-3.556^{***}	-23.081^{***}
Oil Price	0.0023	0.0875	-0.4855	0.4364	-17.319^{***}	-30.686^{***}		0.0036	0.0923	-0.5085	0.4372	-14.382^{***}	-26.660^{***}
Exchange rate	1131.197	158.1306	883.0771	1798.406	-2.202	-14.983^{***}		3.7382	0.3289	3.1332	4.4417	-1.570	-16.001^{***}

Note: GPR is geopolitical risk, FXUS represents the nominal US dollar index, GREA is the global real economic activity and EPU denotes economic policy uncertainty. The ADF Test is the Augmented Dickey-Fuller test statistics for Stationarity. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Appendix B: Bayesian Model Averaging

By using the Bayesian Model Averaging (BMA), the issue of model uncertainty caused by an increase in regressors is lessened. Raftery et al. (1997); Hoeting et al. (1999) make an econometric application of BMA to the linear regression models. Through a model selection process, the BMA determines which model is the "best" one. This model is put up as the authentic model, and conclusions are drawn from it. By calculating a weighted average across all the models, the selection is done. Let's assume, for clarity, that we have n possible explanatory variables of X. We could then estimate models using 2^n regressor combinations. For simplicity, we will refer to all of the explanatory models in this study as $M = M_{1,....,}M_n$, where all of the probabilities are conditional. In this work, assuming Y is the future observation, given the data Z, we estimate Y using a posterior distribution of the type IFP_t which includes the dependent variables in the inflation persistence specifications.

$$Pr(Y|Z) = \sum_{i=1}^{n} Pr(Y|M_n, Z)Pr(M_n|Z), \tag{B.1}$$

where $Pr(M_n|Z)$ is the posterior model probability of M_n which is expressed as

$$Pr(M_n|Z) = \frac{Pr(Z|M_n)Pr(M_n)}{\sum_{j=1}^{n} Pr(Z|M_j)Pr(M_j)}. \tag{B.2}$$

The probability of the posterior model is important for choosing the optimal model for the estimation that takes into account the researcher's prior knowledge of the data. $Pr(M_n)$, the prior probability that M_n is a genuine representation of the model, must therefore be known. Given in Equation B.3 below, $Pr(Z|M_n)$ is the marginal likelihood, which is constant across all models in M.

$$Pr(Z|M_n) = \int Pr(Z|\theta_n, M_n)Pr(\theta_n|M_n)d\theta_n, \tag{B.3}$$

where θ_n contains the coefficients of the model M_n and $Pr(Z|\theta_n, M_n)$ explains the likelihood. $Pr(\theta_n|M_n)$ denotes the prior density of θ_n.

Equation (B.2) yields a model average that is weighted under the posterior model probabilities $Pr(M_n|Z)$, which is referred to as the BMA that improves the estimation performance. The BMA produces the prior and posterior inclusion probabilities for each individual regressor in this way. To elaborate, a prior inclusion probability gives the likelihood that an explanatory variable is incorporated into the model before gaining access to the data. The prior model probabilities of all models that include explanatory variables are added up to calculate it. Conversely, the posterior inclusion probability indicates the likelihood that an explanatory variable will be added to the model after the data has been viewed. The posterior model probabilities of each model that covers those explanatory variables are added up to compute this. We took into account Markov Chain Monte Carlo Model Composition (MCMC) while estimating BMA when simulating from the posterior.

Appendix C: Half-Life Inflation Persistence and Oil Price Decomposition

Table C.1: Half-Life Persistence and Oil Price Return

	$hl_t = \beta_0 + \beta_1 OPR_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t$					
	β_0	β_1	β_2	β_3	β_4	Adj R^2
	Half-Life Persistence					
DE	15.1040***	4.0458	−0.0921	−2.1857**	0.2586	0.0154
	(1.7895)	(7.1686)	(0.7694)	(0.8823)	(2.6953)	
JP	11.7724***	−1.1782	0.3538	−1.7396***	−0.5601	0.1177
	(0.6385)	(3.0712)	(0.3115)	(0.5012)	(0.4357)	
CN	18.2500***	−24.5155	−4.0803	7.2392	−4.4209**	0.0418
	(4.0928)	(24.1006)	(2.9847)	(5.6990)	(1.7243)	
KR	19.9994***	−44.5421	−2.0577	−3.0290**	7.2951	−0.0032
	(5.9597)	(46.1178)	(1.9936)	(1.3014)	(6.9756)	
IN	12.8323***	4.4187	0.0595	−1.3533***	0.1919	0.0718
	(0.6679)	(4.0287)	(0.3550)	(0.4143)	(0.4690)	
	Net Exporters					
US	18.4557***	−38.5930	−5.5937	−4.3914**	−1.9412	0.0461
	(2.9836)	(28.4452)	(4.8200)	(1.7081)	(1.7812)	
CA	14.5000***	13.7892	0.3621	−2.1382*	−1.4187	−0.0025
	(2.4753)	(14.0796)	(1.2805)	(1.2450)	(2.3441)	
BR	2.8905***	−0.3222	−0.1645	−0.0669	−0.8568***	0.2026
	(0.2149)	(1.1727)	(0.1071)	(0.1896)	(0.1429)	
RU	44.4408***	−57.0476	2.9046	−0.4890	2.6268	0.0087
	(3.5990)	(46.0196)	(2.9967)	(2.4232)	(4.3123)	
SA	38.1283***	88.3308	4.8071	−10.0247***	−5.1356	−0.0001
	(9.4718)	(68.5360)	(8.4200)	(3.4948)	(3.4196)	

Note: The table reports the estimates of permanent oil price returns (OPR) impact on the intrinsic inflation persistence (hl_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table C.2: Half-Life Persistence and Cyclical Oil Shock

$\mathrm{hl}_t = \beta_0 + \beta_1 COP_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t$												
	SMA(12)						HP Trend					
	Net Importers											
	β_0	β_1	β_2	β_3	β_4	Adj R^2	β_0	β_1	β_2	β_3	β_4	Adj R^2
DE	15.1246***	−0.1119	−0.1173	−2.1429**	0.2403	0.0149	15.0956***	−6.9593	0.1255	−1.8569**	0.2840	0.0212
	(1.8631)	(8.7344)	(0.7670)	(0.9757)	(2.7122)		(1.7754)	(8.2423)	(0.7300)	(0.8802)	(2.6423)	
JP	11.6733***	3.3116**	0.3641	−1.9397***	−0.4009	0.1294	11.7705***	6.3503**	0.1562	−1.9842***	−0.2957	0.1630
	(0.5352)	(1.6465)	(0.3325)	(0.4517)	(0.3859)		(0.6094)	(3.0097)	(0.3235)	(0.5551)	(0.3354)	
CN	18.2201***	−8.2888	−3.3685	7.6417	−4.3340***	0.0407	18.2576***	6.3328	−3.3657	6.6421	−4.6316**	0.04032
	(4.0770)	(8.5827)	(2.4052)	(5.9867)	(1.6487)		(4.0901)	(7.5734)	(2.3727)	(5.3141)	(1.8759)	
KR	19.2706***	30.2476	−1.5742	−5.5555	7.3362	−0.0026	20.0495***	57.4628	−3.0812	−5.7094	7.0745	0.0022
	(5.2815)	(26.9006)	(1.6937)	(3.4118)	(6.9499)		(5.8647)	(53.8267)	(3.0520)	(3.7907)	(6.4867)	
IN	12.6975***	7.6783**	0.0350	−1.8026***	0.3227	0.1190	12.8639***	3.4181	−0.1301	−1.4716***	0.1984	0.0782
	(0.4799)	(3.7149)	(0.3379)	(0.4315)	(0.3769)		(0.6791)	(3.2590)	(0.3221)	(0.4089)	(0.4737)	
	Net Exporters											
US	18.6418***	−22.9473	−5.1241	−3.0608**	−2.1096	0.0504	18.2745***	−11.7309	−4.4158	−4.1331**	−1.9646	0.0393
	(3.0682)	(15.7842)	(4.4214)	(1.3468)	(1.9273)		(2.9070)	(11.6768)	(4.3886)	(1.8720)	(2.3063)	
CA	14.5126***	2.6471	0.1979	−2.2009	−1.4627	−0.0038	14.5730***	3.0863	0.1038	−2.1673*	−1.4512	−0.0037
	(2.4640)	(7.4583)	(1.1975)	(1.3453)	(2.2813)		(2.5124)	(9.8563)	(1.1368)	(1.1532)	(2.3591)	
BR	2.8770***	0.5176	−0.1550	−0.0855	−0.8485***	0.2045	2.8871***	−0.9493	−0.1418	−0.0372	−0.8765***	0.2087
	(0.2120)	(1.0258)	(0.1067)	(0.1952)	(0.1433)		(0.2134)	(1.0759)	(0.1062)	(0.1976)	(0.1447)	
RU	42.2132***	8.7904	4.4308	−2.3902	3.5881	−0.0095	40.1139***	35.6116	2.8530	−4.6634	4.8925	0.0072
	(4.7974)	(26.5412)	(3.2675)	(3.9834)	(5.2225)		(4.8317)	(32.7936)	(2.9406)	(3.7140)	(5.4605)	
SA	38.1241***	21.2424	2.5168	−10.9486**	−5.5510*	−0.0038	38.1302***	−16.3489	2.4936	−8.4883**	−5.4543	−0.0042
	(9.4346)	(36.9857)	(7.0634)	(4.9447)	(3.3263)		(9.6538)	(19.9095)	(3.4116)	(3.4116)	(3.4599)	

Note: The table reports the estimates of cyclical oil price shock (COP) impact on the intrinsic inflation persistence (hl_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table C.3: Half-Life Persistence and Permanent Oil Shock

$$\text{hl}_t = \beta_0 + \beta_1 POP_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t$$

	SMA(12)						HP Trend					
	β_0	β_1	β_2	β_3	β_4	Adj R^2	β_0	β_1	β_2	β_3	β_4	Adj R^2
Net Importers												
DE	61.5879^{***}	-13.0476^{***}	-0.0814	-1.4840^{**}	4.6523^{*}	0.2660	64.7613^{***}	-13.8371^{***}	-0.5018	-1.1291^{*}	4.8975^{*}	0.2689
	(6.0798)	(1.6198)	(0.6611)	(0.7044)	(2.6877)		(7.0443)	(1.8456)	(0.6438)	(0.6678)	(2.8503)	
JP	-6.7370^{***}	2.2294^{**}	0.2783	-1.9058^{***}	-0.7890^{*}	0.2321	-6.0064	2.1341^{***}	0.3521	-1.9440^{***}	-0.7711^{*}	0.2196
	(6.8329)	(0.8642)	(0.2725)	(0.5184)	(0.4610)		(6.3274)	(0.8020)	(0.2779)	(0.5385)	(0.4564)	
CN	1.1012	2.7807	-3.3383	6.8821	-4.3617^{**}	0.0399	58.0430^{**}	-6.4574	-3.1946	7.4138	-4.9514^{**}	0.0405
	(26.1936)	(4.5200)	(2.4205)	(5.3818)	(1.7301)		(28.7654)	(4.1908)	(2.2838)	(5.6646)	(1.9821)	
KR	-45.6973	6.1026	-1.6721	-3.8367^{*}	5.1268	-0.0033	-25.3073	4.1949	-1.5466	-3.8465^{*}	5.8672	-0.0039
	(94.2252)	(9.2852)	(1.7100)	(2.2128)	(3.9861)		(76.0094)	(7.5633)	(1.5314)	(2.2915)	(4.6715)	
IN	75.6377^{***}	-7.9986^{***}	0.1555	-0.8459^{***}	1.2817^{***}	0.5602	83.4410^{***}	-8.9652^{***}	-0.1571	-0.6220^{**}	1.3190^{***}	0.5882
	(8.5696)	(1.0623)	(0.2428)	(0.3233)	(0.3036)		(9.2464)	(1.1432)	(0.2289)	(0.2707)	(0.2940)	
Net Exporters												
US	31.2096^{*}	-3.4860	-4.4680	-4.2766^{**}	-0.7719	0.0400	35.6139^{**}	-4.6539	-4.5965	-4.0353^{**}	-0.4588	0.0431
	(18.8834)	(5.4090)	(4.5124)	(1.9966)	(1.2107)		(17.4977)	(4.9039)	(4.3172)	(1.9546)	(1.3127)	
CA	63.8573^{***}	-12.7013^{**}	0.4583	-0.4445	2.5371	0.0512	69.1926^{***}	-13.9958^{***}	0.0448	-0.0157	2.9822	0.0571
	(21.9663)	(5.4457)	(1.0503)	(0.8452)	(2.0791)		(21.6584)	(5.2876)	(1.1679)	(0.8315)	(2.1522)	
BR	9.3686^{***}	-1.4133^{***}	-0.1409	0.1735	-0.3397^{***}	0.4235	9.3416^{***}	-1.3996^{***}	-0.1817^{*}	0.1734	-0.3360^{***}	0.4066
	(0.6318)	(0.1331)	(0.0968)	(0.1677)	(0.0930)		(0.6999)	(0.1520)	(0.0951)	(0.1748)	(0.0960)	
RU	-34.0915	9.8240	3.8313	-1.6196	2.8713	-0.0078	86.5843	-5.5071	4.4666	-1.0470	3.6030	-0.0100
	(94.4566)	(12.2002)	(3.0734)	(2.2961)	(4.6761)		(142.1652)	(18.3103)	(3.1795)	(2.7301)	(5.1034)	
SA	32.7943	1.0131	1.9997	-9.2985^{***}	-5.4553^{*}	-0.0049	-18.6173	10.4876	1.7355	-9.9473^{***}	-6.1837^{**}	-0.0038
	(87.6312)	(14.6868)	(7.4044)	(2.8655)	(3.1564)		(86.6134)	(14.5277)	(6.9200)	(2.6335)	(3.1179)	

Note: The table reports the estimates of permanent oil price shock (POP) impact on the intrinsic inflation persistence (hl_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table C.4: Half-Life Persistence and Oil Price Innovation

	$\text{hl}_t = \beta_0 + \beta_1 OPI_{t-1} + \beta_2 FXUS_{t-1} + \beta_3 GREA_{t-1} + \beta_4 EPU_{t-1} + \epsilon_t$					
			Net Importers			
	β_0	β_1	β_2	β_3	β_4	Adj R^2
DE	15.1332***	−3.2636	−0.1341	−2.1317**	0.2386	0.0152
	(1.7931)	(6.5530)	(0.7775)	(0.8795)	(2.7004)	
JP	11.7671***	−0.6561	0.3594	−1.7444***	−0.5486	0.1174
	(0.6323)	(2.3383)	(0.3119)	(0.5071)	(0.4256)	
CN	18.2822***	−12.5932	−3.5858	7.0834	−4.5344**	0.0402
	(4.1265)	(15.1786)	(2.5935)	(5.5694)	(1.8029)	
KR	19.8612***	−14.8816	−1.7543	−3.3437**	7.4560	−0.0042
	(5.8208)	(15.6724)	(1.7297)	(1.5644)	(7.1360)	
IN	12.8434***	1.4934	−0.0054	−1.3291***	0.1706	0.0677
	(0.6724)	(3.3559)	(0.3483)	(0.4111)	(0.4764)	
			Net Exporters			
US	18.4174***	−37.4098	−5.3909	−4.4835**	−1.7145	0.0449
	(2.9563)	(25.0854)	(4.6550)	(1.7472)	(1.8755)	
CA	14.5284***	11.6966	0.3051	−2.1177*	−1.4725	−0.0030
	(2.4880)	(14.9103)	(1.2927)	(1.2395)	(2.3090)	
BR	2.8911***	−0.8659	−0.1705	−0.0647	−0.8544***	0.2039
	(0.2147)	(1.0815)	(0.1064)	(0.1898)	(0.1423)	
RU	44.7614***	−65.5616	3.1420	−0.1645	2.6836	0.0135
	(3.5113)	(51.4329)	(2.9640)	(2.6011)	(4.1650)	
SA	38.0864***	77.4424	4.1715	−9.6355***	−5.2681	−0.0015
	(9.4757)	(54.3814)	(7.7916)	(3.2912)	(3.4220)	

Note: The table reports the estimates of oil price innovation (OPI) impacts on the half-life inflation persistence (hl_t). US broad effective exchange rate ($FXUS$), global economic activity index ($GREA$) and economic policy uncertainty (EPU) are used as control variables. Heteroskedasticity robust standard error is in the parenthesis. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$.

Table C.5: Half-Life Inflation Persistence and Oil Price Decomposition with BMA Model

	Net Importers					Net Exporters				
	DE	JP	CN	KR	IN	US	CA	BR	RU	SA
Intercept	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
OPR	0.3535	0.5184	0.3399	0.4875	0.3167	0.5564	0.3158	0.2781	0.4693	0.3689
COP	0.5708	0.9999	0.2928	0.5824	1.0000	0.3463	0.3222	0.3436	0.7491	0.3361
POP	1.0000	1.0000	0.2845	0.3237	1.0000	0.7195	1.0000	1.0000	0.2840	0.2871
OPI	0.3132	0.3927	0.3144	0.4168	0.3024	0.4450	0.3425	0.2829	0.6540	0.3270
FXUS	0.2934	0.2982	0.3946	0.2895	0.5223	0.9831	0.2712	0.8615	0.2913	0.2999
GREA	0.5820	1.0000	0.9532	0.3646	1.0000	0.9209	0.2947	0.8905	0.3392	0.5337
EPU	1.0000	0.8441	0.5198	0.4111	1.0000	0.3427	0.7158	0.9986	0.4737	0.2997

Note: The table presents the Posterior Inclusion Probability (PIP) of the Bayesian Model Averaging (BMA). PIP indicators between 0.500 and 0.750 (weak) and greater than 0.750 (very strong).