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# A Country-Specific Oil Price Uncertainty Index for the Philippines and Its Implications for Inflation Expectations

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# A Country-Specific Oil Price Uncertainty Index for the Philippines and Its Implications for Inflation Expectations

Aris Zoleta [1] [2]

## Abstract

This paper examines the role of oil price uncertainty in shaping household inflation expectations and broader inflation dynamics in the Philippines. It develops a novel country-specific oil price uncertainty (OPU) index using a news-based approach and combines this measure with quarterly household inflation expectations from the Bangko Sentral ng Pilipinas Consumer Expectations Survey. Using a Bayesian structural vector autoregression identified via narrative sign restrictions, the paper isolates unexpected oil price uncertainty shocks and compares their macroeconomic effects with shocks associated with realized movements in Brent crude oil prices. The results show that positive oil price uncertainty shocks increase household inflation expectations and headline inflation while temporarily reducing output growth. Compared with shocks to Brent crude prices, oil price uncertainty shocks generate larger and more persistent responses of the monetary policy rate and account for a greater share of fluctuations in household inflation expectations, inflation, and monetary policy. Historical decompositions further indicate that oil price uncertainty shocks played an important role during episodes of heightened geopolitical uncertainty, highlighting oil price uncertainty as a distinct transmission channel through which developments in global oil markets affect Philippine inflation dynamics and monetary policy.

*Keywords*: Oil price uncertainty, inflation expectation, brent crude price,

*JEL Classification*: E31, E58, Q43

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Recent geopolitical tensions in the Middle East have contributed to higher crude oil prices and heightened uncertainty regarding their future path. For oil-importing economies such as the Philippines, these developments raise concerns not only about higher production and transportation costs but also about how uncertainty surrounding future energy prices shapes household inflation expectations. For example, An et al. (2023) showed that increases in oil prices account for a substantial share of global inflation expectations, whereas Aharon et al. (2023) and Hammoudeh and Reboredo (2018) documented the nonlinear and asymmetric effects of oil price changes on inflation. In the Philippines, Allon-Pineda et al. (2025) found that global oil price surprises contribute significantly to domestic inflation.

Although realized oil price changes are well known to affect inflation and inflation expectations, it remains unclear whether uncertainty surrounding the future path of oil prices independently influences household inflation expectations beyond the effects of realized oil price movements. This distinction is important because oil price uncertainty may affect economic decisions through channels that differ from those associated with realized oil price shocks. The literature showed that oil price uncertainty dampens investment and influences macroeconomic activity through distinct channels (Elder & Serletis, 2009; Kilian, 2009; Baumeister & Hamilton, 2019). More recently, researchers have developed both news-based and market-based measures of oil price uncertainty (OPU). For example, Abiad and Qureshi (2023) constructed a news-based OPU index, whereas other studies develop uncertainty measures using commodity futures and financial market indicators (Triantafyllou et al., 2025; Niu et al., 2022; Zhu et al., 2022).

However, despite these advances in measuring oil price uncertainty, relatively little is known about whether uncertainty surrounding future oil prices independently shapes household inflation expectations in the Philippine context. In the Philippine literature, research on inflation expectations has primarily focused on expectation formation, monetary policy communication, and forecast accuracy. Existing studies find that household inflation expectations tend to be upward-biased, substantially backward-looking, and generally less accurate than those of professional forecasters (Cacnio & Basilio, 2022; Guinigundo, 2016; Arcin & Castañares, 2022). More recent studies also highlight the importance of supply-side factors, including climate shocks, food supply disruptions, and oil prices, in shaping inflation expectations and inflation dynamics (Españo et al., 2024; International Monetary Fund, 2024). Despite this growing body of literature, the role of uncertainty surrounding future oil prices remains largely unexplored. Existing Philippine studies have primarily examined the effects of realized oil price movements and other supply-side shocks, whereas available text-based measures of uncertainty, such as those developed by Basilio et al. (2023) and Ahir et al. (2022), capture broader economic or policy uncertainty rather than uncertainty specific to energy markets. Consequently, it remains unclear whether oil price uncertainty constitutes an independent source of variation in household inflation expectations. This paper addresses this gap by examining the role of oil price uncertainty in shaping household inflation expectations and broader inflation dynamics in the Philippines.

The paper contributes to the literature in two important ways. First, it develops a novel country-specific OPU index for the Philippines using a news-based approach, building on Abiad and Qureshi (2023) and Baker et al. (2015). By isolating uncertainty specifically related to oil markets, the index provides a more targeted measure for examining the role of oil-related uncertainty in

inflation dynamics and complements existing measures of broader economic and policy uncertainty. Second, the paper provides new empirical evidence on the relationship between oil price uncertainty and household inflation expectations in the Philippines. In particular, it examines whether uncertainty surrounding the future path of oil prices affects household inflation expectations independent of realized oil price movements. In doing so, the paper identifies an important transmission channel through which developments in global oil markets may influence inflation dynamics and monetary policy in the Philippines.

To examine this relationship, the paper estimates a Bayesian structural vector autoregression (SVAR) identified using narrative sign restrictions (NSR). The identification strategy combines narrative information with economically motivated sign restrictions to isolate unexpected oil price uncertainty shocks, drawing on the broader narrative identification approach of Romer and Romer (2010) and the literature on structural identification of oil-market shocks (Kilian, 2009). Narrative information is used to identify episodes in which geopolitical developments and major disruptions in global oil markets generated heightened uncertainty regarding the future path of crude oil prices. These historically validated episodes are incorporated as narrative restrictions within the Bayesian SVAR framework, requiring an identified oil price uncertainty shock to be associated with an increase in oil price uncertainty during these episodes. Sign restrictions are then used to distinguish oil price uncertainty shocks from other structural disturbances, including shocks associated with realized movements in Brent crude oil prices. The model subsequently traces the dynamic effects of identified OPU shocks on output growth, household inflation expectations, inflation, and the monetary policy rate. Forecast error variance decomposition and historical decomposition are employed to assess the relative importance of oil price uncertainty shocks relative to realized Brent crude oil price shocks in explaining movements in these variables.

The empirical results show that oil price uncertainty exerts economically meaningful effects on household inflation expectations, realized inflation, and monetary policy. Although both realized Brent crude oil price shocks and oil price uncertainty shocks generate inflationary pressures, oil price uncertainty shocks account for a substantially larger share of the forecast error variance of realized inflation, household inflation expectations, and the monetary policy rate across forecast horizons. These findings suggest that uncertainty surrounding the future path of oil prices constitutes an important transmission channel through which developments in global crude oil markets influence inflation dynamics in the Philippines. The historical decomposition and impulse responses of the monetary policy rate provide particularly informative evidence. At the onset of the post-pandemic inflation episode, oil price uncertainty shocks account for a substantially larger share of movements in the policy rate than shocks associated with realized Brent crude oil price changes. Moreover, the effects of oil price uncertainty shocks on the policy rate appear more persistent over time. Taken together, these findings suggest that uncertainty surrounding future oil prices may play an important role in shaping monetary policy responses beyond the effects associated with realized oil price movements.

The remainder of the paper proceeds as follows. Section 2 presents descriptive evidence on the relationship between oil-price-related shocks and household inflation expectations. Section 3 describes the construction of the OPU index, whereas Section 4 discusses the narrative approach used to identify oil price uncertainty shocks. Section 5 compares the proposed OPU index with

other news-based and market-based uncertainty measures. Section 6 outlines the empirical methodology, and Section 7 presents the empirical results. Finally, Section 8 concludes.

## Descriptive Analysis of Household Inflation Expectations

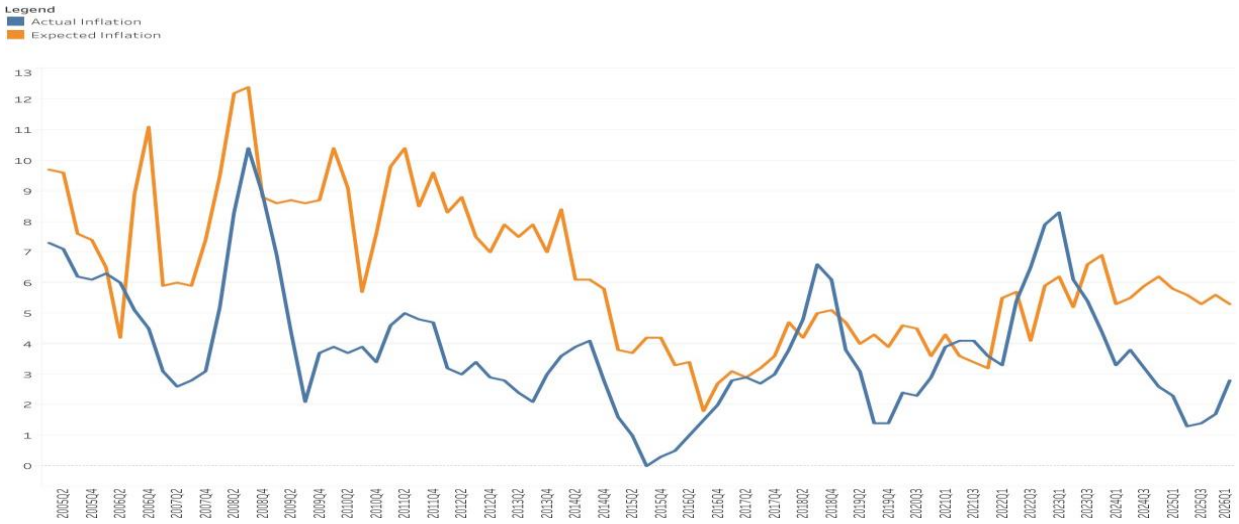
Since its inception in 2004, the Bangko Sentral ng Pilipinas (BSP) has measured household inflation expectations through its quarterly Consumer Expectations Survey (CES). The survey initially covered expectations for price changes across 14 Consumer Price Index (CPI) commodity groups over the next 12 months, and expanded to 24 commodity groups in 2022. The CES provides both qualitative and quantitative measures of 12-month-ahead household inflation expectations and therefore offers a valuable framework for examining whether uncertainty surrounding future oil prices influences inflation expectations even before actual price increases materialize.

This section presents three general observations about inflation expectations in the Philippines. Collectively, these observations indicate that household inflation expectations are closely linked to developments in global oil markets and underscore the importance of distinguishing realized oil price movements from uncertainty about future oil prices.

### Household Consistently Overestimate Actual Inflation

Figure 1 plots household inflation expectations against realized inflation over the period 2005: Q1–2026: Q1. Throughout most of the sample, expected inflation remains above realized inflation, indicating a persistent tendency for households to overestimate future inflation. Two notable exceptions occur during 2018: Q2–2018: Q4 and 2022: Q3–2023: Q2, when realized inflation temporarily exceeded household expectations.

**Figure 1**
*Expected Versus Actual Inflation*




*Note*: Expected inflation refers to households' 12-month-ahead (four-quarter-ahead) inflation expectations from the Consumer Expectations Survey (CES). Actual inflation is measured as the year-on-year growth rate of the headline Consumer Price Index. Sources: BSP (2026) and PSA (2026).

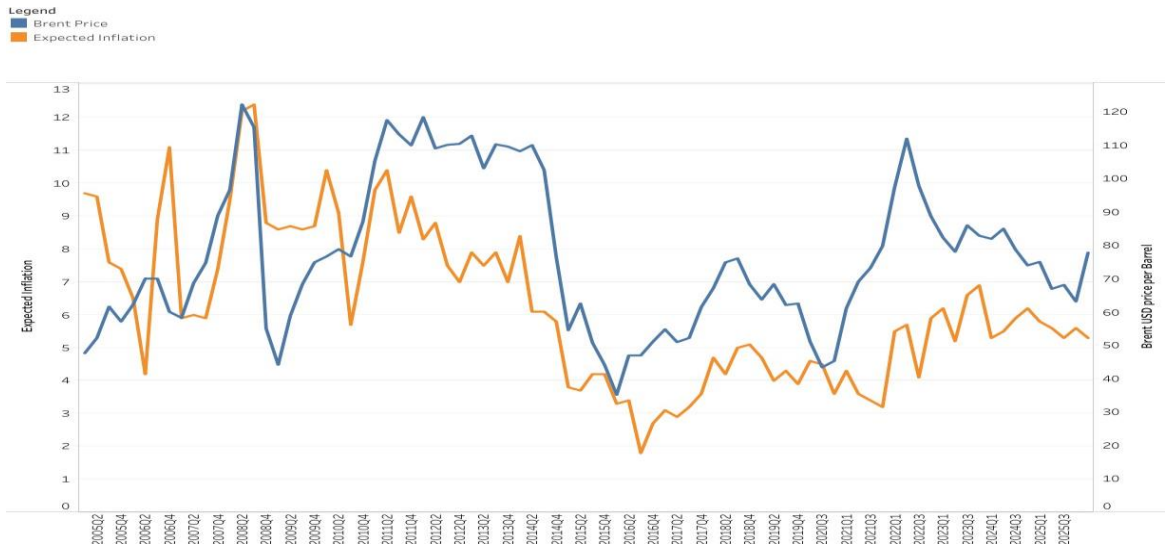
The first episode coincided with the 2018 inflation surge following Typhoon Ompong, which disrupted agricultural production in Northern Luzon and contributed to sharp increases in food prices. The second occurred during the post-pandemic recovery, when demand rebounded more rapidly than supply, resulting in elevated inflation amid persistent global supply chain disruptions. Following the 2008 Global Financial Crisis (GFC), inflation expectations exhibited a gradual downward trend. Cacnio and Basilio (2022) documented a similar pattern and attribute it to the relatively strong macroeconomic performance of the Philippine economy during the post-GFC period. Greater confidence in macroeconomic stability may have contributed to lower perceived inflationary pressures among households.

Another notable feature of the data is the evolution of the gap between expected and realized inflation. The gap remained relatively wide from 2008: Q3 to 2016: Q3, narrowed thereafter, and widened again beginning in 2023: Q3, approximately one year after Russia's invasion of Ukraine. This renewed divergence suggests that households became increasingly concerned about future inflation during a period characterized by heightened global energy market uncertainty.

**Inflation Expectations Closely Track Brent Crude Oil Prices**

Figure 2 compares household inflation expectations with Brent crude oil prices. The two series exhibit a pronounced degree of co-movement throughout the sample period. Periods of elevated oil prices generally coincide with higher inflation expectations, suggesting that developments in global energy markets play an important role in shaping household perceptions of future inflation. Table 1 further summarizes this relationship.

**Figure 2**
*Expected Inflation Versus Brent Crude Oil Prices*




*Note*: Expected inflation refers to households' 12-month-ahead (four-quarter-ahead) inflation expectations from the Consumer Expectations Survey (CES). Brent crude oil prices are measured in U.S. dollars per barrel. Sources: BSP (2026) and FRED (2026).

**The Relationship Between Inflation Expectations, Inflation, and Oil Prices Strengthened after the GFC**

Table 1 reports the Pearson correlation coefficients between household inflation expectations, realized inflation, and Brent crude oil prices. Inflation expectations are positively correlated with both realized inflation and crude oil prices throughout the sample. However, these relationships are strongest during the post-GFC period (2008: Q3–2016: Q3), suggesting that households became more responsive to macroeconomic and energy price developments during this episode.

**Table 1**
*Correlation of Expected Inflation With Actual Inflation and Brent Crude Oil Prices*

| Sample Period | Actual Inflation | Brent Crude Oil Prices |
|---|---|---|
| Full Sample | 0.512 | 0.514 |
| 2008: Q3–2016: Q3 | 0.674 | 0.592 |
| 2016: Q4–2026: Q1 | 0.317 | 0.441 |

The strong association between inflation expectations and Brent crude oil prices is consistent with the broader literature emphasizing the importance of oil price movements in inflation dynamics (Aharon et al., 2023; Hammoudeh & Reboredo, 2018; Kilian, 2009; Kilian & Zhou, 2022). It is also consistent with the findings of Guinigundo (2016) and Cacnio and Basilio (2022), who showed that commodity and energy prices play an important role in shaping household inflation expectations in the Philippines.

Taken together, these stylized facts suggest that developments in global oil markets are closely associated with household inflation expectations in the Philippines. However, the evidence presented thus far is based primarily on realized crude oil price movements. It does not distinguish between the effects of actual oil price changes and uncertainty regarding their future path. This distinction is important because households may respond not only to realized increases in oil prices but also to heightened uncertainty surrounding future energy costs. Motivated by this observation, the following section develops a country-specific OPU index for the Philippines to isolate the role of oil price uncertainty in shaping inflation expectations.

## Measuring the Country-Specific Oil Price Uncertainty Index for the Philippines

This section describes the construction of the country-specific OPU index for the Philippines. Following the news-based methodology of Baker et al. (2015) and Abiad and Qureshi (2023), the index measures the intensity of newspaper coverage related to oil price uncertainty. Unlike realized oil price series, the proposed index captures uncertainty surrounding the future path of oil prices as reflected in domestic news coverage.

### Factiva Search Algorithm

Factiva serves as the primary source of newspaper articles used to construct the OPU index.

Maintained by Dow Jones, Factiva is a global news and business information database that provides access to current and historical content from newspapers, newswires, industry publications, websites, company reports, and other media sources. Its extensive coverage of Philippine newspapers makes it well suited for constructing a country-specific, news-based measure of oil price uncertainty. The search algorithm identifies articles related to oil price uncertainty by requiring each article to contain terms from three keyword groups: (a) oil-related terms ("oil," "petrol," "petroleum," "gas," or "gasoline"), (b) price-related terms, and (c) uncertainty-related terms. The search covers articles published between January 1990 and April 2026, and the resulting article counts are aggregated to the monthly frequency.

To improve the relevance of the dataset, the search is restricted to leading English-language broadsheet newspapers in the Philippines. Table 2 lists the newspaper outlets included in the analysis. To ensure that the retrieved articles contain sufficient textual content, only articles with more than 99 words are retained. Additional filters exclude sports articles, editorials, abstracts, advertorials, sponsored content, advice columns, blogs, analyses, and commentaries, as these categories are less likely to contain economically relevant information on oil markets. After applying these restrictions, the final dataset consists of 1,871 newspaper articles.

**Table 2**
*Newspapers Included in the Construction of the OPU Index*

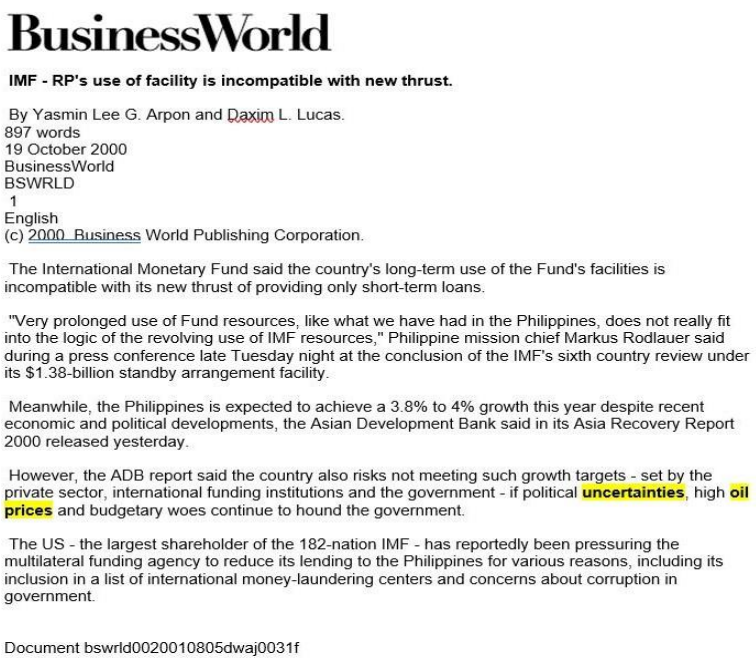
| | |
|---|---|
| Bilyonaryo (Philippines) | Manila Bulletin (Philippines) |
| BusinessWorld (Philippines) | Manila Standard (Philippines) |
| Daily Tribune (Philippines) | Philippine Daily Inquirer |
| Esquire Philippines (Philippines) | The Philippine Star |
| | The Manila Times (Philippines) |

## Textual Feature Extraction

All articles retrieved from Factiva were downloaded in Rich Text Format (RTF). Figure 3 illustrates the structure of a typical article downloaded from the database. The articles were subsequently converted into a machine-readable format, and their textual features were extracted using recurring patterns in the article structure. The extracted information includes the article title, publication date, newspaper source, document identification number, and article content, all of which were stored in a JavaScript Object Notation (JSON) file. The text located between the article separator and the document identification number constitutes the main body of the article and serves as the primary input for constructing the OPU index. [3]

[3] Regular expressions (RegEx) were implemented in Python to identify and extract the relevant textual features from each article.

**Figure 3**
*Example of a Factiva Newspaper Article*



BusinessWorld

**IMF - RP's use of facility is incompatible with new thrust.**

By Yasmin Lee G. Arpon and Daxim L. Lucas.
897 words
19 October 2000
BusinessWorld
BSWRLD
1
English
(c) 2000 Business World Publishing Corporation.

The International Monetary Fund said the country's long-term use of the Fund's facilities is incompatible with its new thrust of providing only short-term loans.

"Very prolonged use of Fund resources, like what we have had in the Philippines, does not really fit into the logic of the revolving use of IMF resources," Philippine mission chief Markus Rodlauer said during a press conference late Tuesday night at the conclusion of the IMF's sixth country review under its $1.38-billion standby arrangement facility.

Meanwhile, the Philippines is expected to achieve a 3.8% to 4% growth this year despite recent economic and political developments, the Asian Development Bank said in its Asia Recovery Report 2000 released yesterday.

However, the ADB report said the country also risks not meeting such growth targets - set by the private sector, international funding institutions and the government - if political **uncertainties**, high **oil prices** and budgetary woes continue to hound the government.

The US - the largest shareholder of the 182-nation IMF - has reportedly been pressuring the multilateral funding agency to reduce its lending to the Philippines for various reasons, including its inclusion in a list of international money-laundering centers and concerns about corruption in government.

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## Constructing the Country-Specific OPU Index

The objective of the OPU index is to measure the intensity of newspaper coverage related to oil price uncertainty over time. Following Abiad and Qureshi (2023) and Baker et al. (2015), an article contributes to the index only if it contains terms from all three keyword categories: "oil," "price," and "uncertainty." If the keyword combination appears multiple times within the same article, each occurrence is counted separately, allowing a single article to contribute multiple observations. As noted by Abiad and Qureshi (2023) and Baker et al. (2015), raw article counts are not directly comparable over time because the total volume of newspaper coverage varies across periods.

To construct a time-consistent index, the raw article counts are standardized and normalized using the procedure proposed by Abiad and Qureshi (2023) and Baker et al. (2015). The procedure consists of three steps:

1. Raw article counts are scaled by the total number of newspaper articles published within each newspaper-month observation.
2. The resulting newspaper-level series are standardized to have unit standard deviation over the period 2005–2026 and then averaged across newspapers for each month.
3. The monthly average series is normalized to have a mean value of 100 over the period January 2005 to April 2026.

For completeness and ease of replication, the normalization procedure can be expressed formally. Let $X_{i,t}$ denote the scaled article frequency for newspaper $i$ in month $t$, where $i = 1,2,3 \dots N$. Let

$T_1$ denote the standardization period and $T_2$ denote the normalization period. The normalized OPU index is then obtained as follows: [4]

1. Compute the time-series standard deviation, $\sigma_i$, for each newspaper over the standardization period.

2. Standardize the scaled article frequencies:

$$Y_{i,t} = \frac{X_{i,t}}{\sigma_i}$$

3. Compute the monthly average across newspapers:

$$Z_t = \frac{1}{N} \sum_{i=1}^{N} Y_{i,t}$$

4. Compute the mean of $Z_t$ over the normalization period:

$$M = \frac{1}{T_1} \sum_{t \in T_2} Z_t$$

5. Normalize the series so that its mean equals 100:

$$OPU_t = Z_t \times \frac{100}{M}$$

**Narrative Validation of the Country-Specific OPU Index**

This section provides a narrative validation of the country-specific OPU index. Following the narrative methodology of Romer and Romer (2010) and Shiller (2017), the major spikes in the OPU index are linked to historically documented geopolitical events and disruptions in global oil markets. Rather than relying solely on statistical evidence, the narrative approach provides qualitative validation that the proposed index captures economically meaningful episodes of heightened oil price uncertainty.

Figure 4 plots the country-specific OPU index together with major global oil market events. The

[4] This notation is heavily borrowed from Abiad and Qureshi (2023)

figure shows that pronounced increases in the index coincide with episodes of geopolitical conflict, supply disruptions, and heightened uncertainty in international energy markets. To validate these episodes, the original newspaper articles associated with each spike in the index were manually reviewed to identify the underlying sources of oil price uncertainty reported at the time. The narrative evidence was subsequently cross-checked against external sources, including policy briefs, official government documents, analytical reports, and other publicly available materials, to verify the historical interpretation of each event. This validation exercise strengthens the credibility of the OPU index by demonstrating that periods of elevated uncertainty closely correspond to well-documented developments in global oil markets rather than to random fluctuations in newspaper coverage.

**Figure 4**
*Country-Specific Oil Price Uncertainty Index and Selected Global Events*

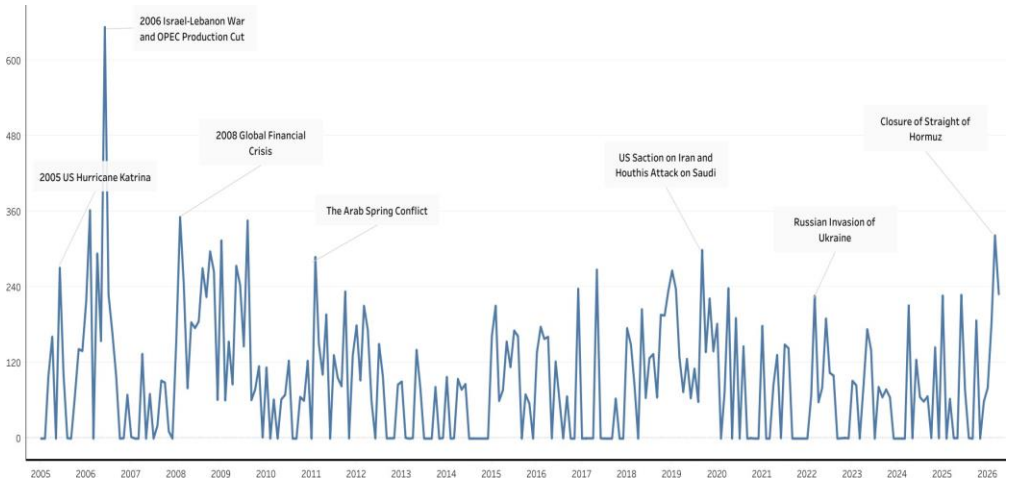



Table 3 summarizes the major episodes identified through the narrative analysis. For each episode, the table documents the underlying developments in the global oil market, together with the contemporaneous domestic policy environment in the Philippines. The domestic context highlights how international oil market disruptions influenced policy discussions and economic conditions in the Philippines, illustrating the relevance of the proposed OPU index for understanding inflation dynamics and monetary policy.

**Table 3**

*Major Oil Price Shock Events*

| Event | Description | Domestic Environment |
|---|---|---|
| 2005 Hurricanes Katrina | Hurricanes Katrina and Rita disrupted U.S. Gulf oil production and refining capacity, causing significant supply disruptions and upward pressure on global crude oil prices. | The passage of Republic Act No. 9337, which imposed a 10% Value Added Tax (VAT) on fuel; proposals to revise the Oil Price Stabilization Fund (OPSF); growing support for shifting the transport sector toward compressed natural gas (CNG); and proposals to expand the use of renewable fuels such as bioethanol. |
| 2006 Israel–Lebanon War, OPEC Production Cut, Possible Wider Middle East Tensions and Civil War in Nigeria | In February 2006, Al-Qaeda attempted to attack Saudi Arabia's Abqaiq oil facility. During the same period, militant attacks on Iraqi oil pipelines disrupted crude oil supplies to Turkey and parts of Europe. In July 2006, the Israel–Lebanon War heightened concerns over wider conflict in the Middle East. The civil war in Nigeria caused the temporary closure of some oil facilities. | Executive Order No. 527 temporarily adjusted import duty rates on crude petroleum oils and refined petroleum products by linking tariff rates to the level of crude oil prices. There was also a proposal to establish an Asian bond mechanism through which petrodollar earnings from oil-producing countries could be recycled back into the region. |
| 2008 Global Financial Crisis | The peak in crude oil prices before the Global Financial Crisis was driven by rising demand from emerging market economies, particularly China, and concerns over limited OPEC spare capacity. However, prices declined sharply as the global economic slowdown weakened oil demand. | Renewed interest emerged in reviving the use of CNG in the transportation sector. The National Economic and Development Authority also formed a committee to review local pump prices. |
| 2011 Arab Spring Conflict | The Arab Spring refers to a series of protests and uprisings across the Middle East and North Africa. The associated oil price shock was largely linked to heightened geopolitical uncertainty, particularly the civil wars in Libya and Syria. | There were proposals in Congress to amend Republic Act No. 8479, or the Downstream Oil Industry Deregulation Act, to grant the Department of Energy (DOE) broader authority to help mitigate high pump prices, including expanded powers to regulate oil prices. |
| 2018–2019 U.S. Renewed Sanctions on Iran and Houthi Attack on Saudi Oil Facilities | In May 2018, the United States withdrew from the Iran nuclear deal and reimposed sanctions on Iran. Tensions escalated in the Strait of Hormuz, while Houthi attacks on Saudi oil facilities in September 2019 further contributed to upward pressure on | The DOE activated the Oil Contingency Task Force (OCTF) to assess and mitigate the impact of oil price increases following attacks on Saudi oil facilities and related developments. It also promoted the Philippine Conventional Energy Contracting Pro- |

| | | |
|---|---|---|
| | crude oil prices. | gram (PCECP) to encourage the discovery of indigenous energy sources. |
| 2022 Russian Invasion of Ukraine | In February 2022, Russia invaded Ukraine, leading to a full-scale war and additional sanctions from the United States and its allies. These developments heightened uncertainty over global crude oil supply and contributed to upward pressure on oil prices. | The Department of Agriculture (DA) expressed readiness to provide fuel subsidies to affected fisherfolk amid higher oil prices linked to the Russia–Ukraine war. Renewed interest also emerged in amending the oil deregulation law, while several policymakers expressed support for planned oil and gas exploration in the West Philippine Sea (WPS) as a way to reduce the country's exposure to oil price volatility. The Social Amelioration Program (SAP) was also proposed for expansion to help poor households cope with rising food prices. |
| 2026 Middle East Tensions and Closure of the Strait of Hormuz | In February 2026, the United States and Israel initiated attacks on Iran. Iran retaliated against key U.S. allies in the region, while the blockade of the Strait of Hormuz disrupted major crude oil shipping routes and intensified global oil price pressures. | Many economists called on the President and economic managers to strengthen fuel subsidies and assistance for vulnerable segments of the population instead of blanket removal of fuel excise tax. The Senate also approved a measure granting the President emergency powers to lower or suspend excise taxes on petroleum products. |

Taken together, the narrative evidence indicates that the major peaks in the country-specific OPU index coincide with historically significant episodes of geopolitical conflict, oil supply disruptions, and heightened uncertainty in global energy markets. The close correspondence between the identified spikes and documented historical events provides qualitative validation of the proposed index and suggests that it captures economically meaningful variation in oil price uncertainty. Moreover, several of these episodes are subsequently used as narrative restrictions in the Bayesian SVAR, providing a direct link between the construction of the index and the empirical identification strategy employed in the following sections.

## Comparison With Other Measures of Uncertainty

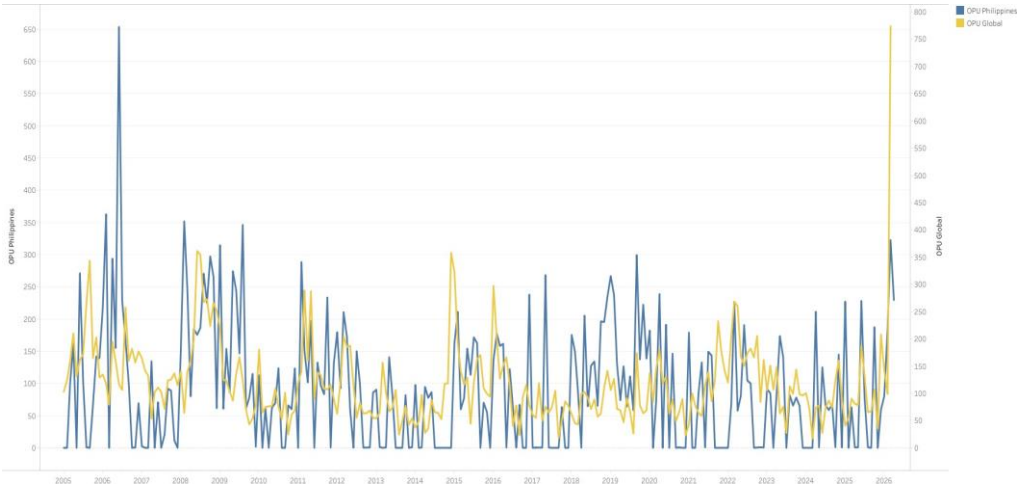
This section compares the proposed country-specific OPU index with existing text-based and market-based measures of uncertainty. The objective is to assess whether the proposed index captures information beyond existing uncertainty measures while highlighting the major events associated with its movements. The comparison also provides preliminary evidence on the extent to which the country-specific OPU index reflects global oil market developments, broader economic uncertainty, and financial market volatility.

## Country-Specific Versus Global Oil Price Uncertainty

Figure 5 compares the country-specific OPU index developed in this paper with the OPU index of Abiad and Qureshi (2023), which is constructed using approximately 50 U.S. newspaper outlets. The country-specific OPU index exhibits pronounced spikes during major episodes of global oil market disruptions and broadly tracks the movements of the global OPU index. This co-movement suggests that oil price uncertainty in the Philippines is closely linked to developments in international oil markets, consistent with the literature showing that oil price uncertainty tends to increase during periods of geopolitical conflict, supply disruptions, and global demand shocks.

Despite these similarities, the two series do not move identically. This finding is consistent with the literature emphasizing the importance of local information, media salience, and country-specific exposure in shaping news-based uncertainty measures (Baker et al., 2015; Abiad & Qureshi, 2023). Several episodes are more pronounced in the country-specific OPU index than in the global measure, suggesting that domestic newspapers place greater emphasis on oil market developments perceived to have stronger implications for local energy prices and household welfare. For example, the country-specific OPU index records larger increases during the 2006 Israel–Lebanon War and selected OPEC production cuts, whereas the global OPU index responds more strongly to recent Middle East tensions and concerns over the Strait of Hormuz. These differences indicate that the proposed OPU index is not merely a local replication of the global measure but rather reflects how international oil market developments are interpreted through the lens of Philippine news coverage.

**Figure 5**
*Country-Specific Versus Global Oil Price Uncertainty*




*Source:* Global OPU index from Abiad & Qureshi (2023).

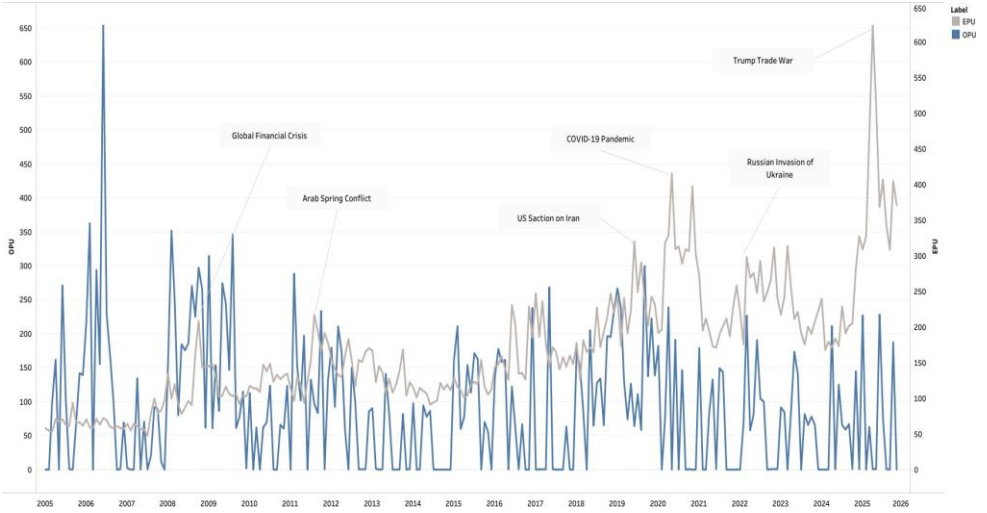
## Oil Price Uncertainty and Other News-Based Measures of Uncertainty

Figure 6 compares the country-specific OPU index with the economic policy uncertainty (EPU) index developed by Baker et al. (2015). Whereas the OPU index focuses specifically on uncertainty surrounding future oil prices, the EPU index captures broader uncertainty associated with economic policy developments.

The two indices display substantial co-movement between 2008 and 2019, suggesting that oil price uncertainty tends to rise during periods of broader economic and policy uncertainty. However, beginning in 2020, the two measures diverge noticeably. Although the EPU index remains persistently elevated during the COVID-19 pandemic and subsequent global policy disruptions, the country-specific OPU index exhibits sharper but shorter-lived spikes associated with disruptions in global oil markets.

The observed divergence suggests that the proposed OPU index captures a more narrowly defined source of uncertainty than the EPU index. In particular, the country-specific OPU index appears to be more responsive to energy market disruptions, geopolitical risks, and oil supply shocks, whereas the EPU index reflects broader and more persistent macroeconomic and policy uncertainty.

**Figure 6**
*Country-Specific Oil Price Uncertainty Versus Economic Policy Uncertainty*




*Note*: OPU = Oil Price Uncertainty; EPU = Economic Policy Uncertainty

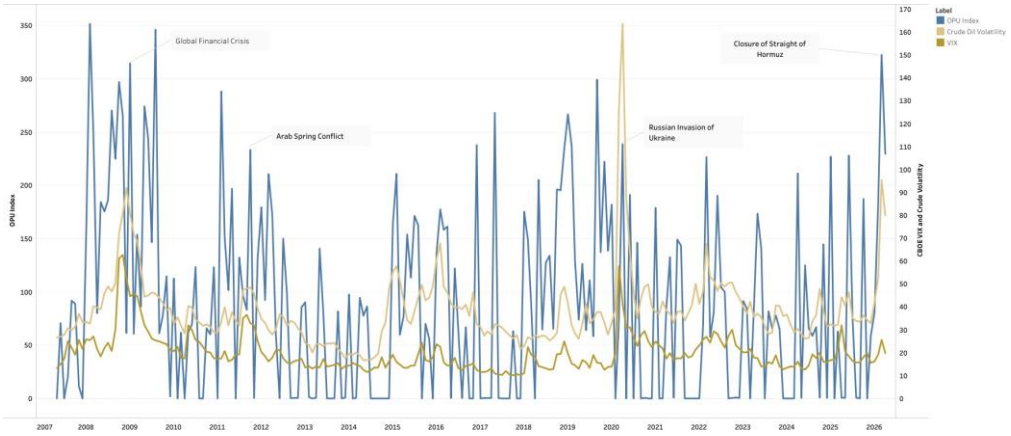
## Country-Specific Oil Price Uncertainty and Market-Based Measures of Uncertainty

Figure 7 compares the country-specific OPU index with two widely used market-based measures of uncertainty: the CBOE Crude Oil Volatility Index (OVX), which measures implied volatility in

crude oil markets, and the CBOE Volatility Index (VIX), which measures expected volatility in the U.S. equity market. The OVX records its largest increase during the Russian invasion of Ukraine, exceeding the spike associated with recent Middle East tensions. This finding highlights the exceptional impact of the Russia–Ukraine conflict on market expectations regarding future oil supply disruptions. More generally, major peaks in the country-specific OPU index coincide with increases in both the OVX and VIX, suggesting that episodes of heightened oil price uncertainty are accompanied by elevated uncertainty in both energy and financial markets. Despite this broad co-movement, the country-specific OPU index differs from market-based measures in that it reflects uncertainty communicated through domestic news coverage rather than expectations implied by financial market prices. Consequently, the proposed index complements existing market-based indicators by capturing the information environment facing households and policymakers.

Taken together, these comparisons suggest that the proposed country-specific OPU index captures information that is related to but distinct from existing text- and market-based measures of uncertainty. Although the index co-moves with broader uncertainty indicators during major global events, it places greater emphasis on oil market developments that are salient in Philippine news coverage. This distinction supports using the country-specific OPU index as a complementary measure to examine the role of oil price uncertainty in shaping household inflation expectations and macroeconomic dynamics in the Philippines.

**Figure 7**
*Country-Specific Oil Price Uncertainty Versus Market-Based Measures of Uncertainty*




*Note*: OPU = Oil Price Uncertainty; OVX = CBOE Crude Oil Volatility Index; VIX = CBOE Volatility Index.
Sources: CBOE

Taken together, these comparisons suggest that the proposed country-specific OPU index captures information that is related to but distinct from existing text- and market-based measures of uncertainty. Although the index co-moves with broader uncertainty indicators during major global events, it places greater emphasis on oil market developments that are salient in Philippine news coverage. This distinction supports the use of the country-specific OPU index as a complementary

measure for examining the role of oil price uncertainty in shaping household inflation expectations and macroeconomic dynamics in the Philippines.

## Empirical Methodology

This section describes the empirical framework used to examine the macroeconomic effects of oil price uncertainty shocks in the Philippines. The analysis employs a Bayesian SVAR to identify exogenous oil price uncertainty shocks and trace their dynamic effects on output growth, household inflation expectations, inflation, and the monetary policy rate. The identification strategy builds on the seminal work of Kilian (2009) and extends it by incorporating NSR to identify economically meaningful oil price uncertainty shocks.

### SVAR Specification

Since the seminal contribution of Sims (1980), vector autoregressive (VAR) models have become one of the standard empirical tools for analyzing macroeconomic fluctuations and the transmission of oil price shocks (Kilian, 2009; Kilian & Lee, 2014; Kilian & Murphy, 2014; Baumeister & Hamilton, 2019; Kilian & Zhou, 2022). A VAR model captures the joint dynamics among a set of endogenous variables by expressing each variable as a function of its own lagged values and the lagged values of all other variables in the system. The reduced-form VAR ($p$) can be written as:

$$y_t = \bar{A} + \sum_{i=1}^{p} A_i y_{t-1} + \varepsilon_t$$

where $y_t$ denotes the vector of endogenous variables, $\bar{A}$ is a vector of intercepts, $A_i$ denotes the coefficient matrix associated with lag $i$, $\varepsilon_t$ is the vector of reduced-form innovations, and $p$ is the lag length. The empirical model consists of six endogenous variables:

$$y_t = \begin{bmatrix} opu_t \\ brent_t \\ gdp_t \\ \pi_t^e \\ \pi_t \\ i_t \end{bmatrix}$$

where $opu_t$ denotes the country-specific OPU index, $brent_t$ is the Brent crude oil price, $gdp_t$ is output growth, $\pi_t^e$ denotes household inflation expectations, $\pi_t$ is headline inflation, and $i_t$ represents the monetary policy rate. The corresponding innovations represent unexpected movements in each variable after controlling for the information contained in the lagged values of the VAR system.

The six endogenous variables are selected to capture the principal transmission channels through which oil price uncertainty affects the Philippine economy. The country-specific OPU index represents the exogenous source of oil market uncertainty, whereas Brent crude oil prices capture realized movements in international oil prices. Output growth reflects real economic activity; household inflation expectations capture the expectations channel; headline inflation measures the pass-through of oil price shocks to domestic prices; and the monetary policy rate represents the monetary policy response. Collectively, these variables summarize the key channels through which oil price uncertainty is transmitted to the macroeconomy.

The reduced-form VAR is estimated within a Bayesian framework using a hierarchical Minnesota prior. The Minnesota prior shrinks autoregressive coefficients toward parsimonious values, thereby reducing parameter uncertainty and mitigating the overparameterization commonly encountered in unrestricted VAR models. The hierarchical specification allows the degree of shrinkage to be estimated from the data rather than fixed a priori. This approach is particularly appropriate in the present study because the model contains six endogenous variables but is estimated using a relatively small quarterly sample. Consequently, Bayesian shrinkage improves estimation efficiency while preserving the dynamic relationships among the variables.[5]

**Empirical Identification Strategy**

The use of narrative information to identify structural shocks in SVAR models was first proposed by Romer and Romer (2010). Its application to oil market analysis was subsequently developed by Kilian (2009). This study adopts the NSR framework of Antolın-dıaz and Rubio-Ram´ırez (2018), which combines conventional sign restrictions with historical information from well-identified economic episodes.

Traditional sign restrictions identify structural shocks by imposing theoretically motivated sign restrictions on the impulse responses of selected variables over a finite horizon. Unlike recursive identification schemes, sign restrictions do not require imposing a contemporaneous causal ordering among the variables and therefore provide greater flexibility in identifying economically meaningful structural shocks.

A key advantage of the NSR approach is that it combines conventional sign restrictions with historical information derived from well-documented economic events. Such information substantially narrows the set of admissible structural decompositions while preserving the flexibility of sign-restricted Bayesian VAR. This feature is particularly valuable in the present study because the narrative validation of the country-specific OPU index identifies several major geopolitical events that provide credible information for identifying exogenous oil price uncertainty shocks. Consequently, the identification strategy directly links the narrative evidence presented in the previous section with the structural estimation of the Bayesian SVAR.

In this paper, the sign restrictions are imposed to capture the expected response of the economy to

[5] The Bayesian SVAR with sign restrictions is estimated in R using the bsvarSIGNs package developed by Wang and Wo´zniak (2025).

major global events affecting crude oil markets, during which oil price uncertainty increases, Brent crude oil prices rise, and economic activity declines. During the historical validation of the index, specific historical episodes associated with significant increases in oil price uncertainty were identified. These events are used as narrative restrictions to further inform the identification of oil price uncertainty shocks. Tables 4 and 5 summarize the sign and narrative restrictions imposed in the Bayesian SVAR.

**Table 4**
*Sign Restrictions for an Oil Price Uncertainty Shock*

| Variable | Sign |
|---|---|
| Country Specific OPU | + |
| Brent Crude Oil Price | + |
| Output Growth | _ |

**Table 5**
*Historical Episodes Used for Narrative Sign Restrictions*

| Quarter | Date | Event |
|---|---|---|
| Q3 2005 | September 30, 2005 | Hurricane Katrina |
| Q3 2006 | September 30, 2006 | Lebanon War |
| Q1 2011 | March 31, 2011 | Arab Spring and Libyan Civil War |
| Q3 2019 | September 30, 2019 | Saudi Aramco Abqaiq–Khurais attack |
| Q1 2022 | March 31, 2022 | Russia–Ukraine War |

**Data Collection**

The empirical analysis uses quarterly data covering the period from 2005: Q1 to 2026: Q1. Household inflation expectations and the monetary policy rate are obtained from the BSP, whereas headline inflation and real gross domestic product (GDP) are sourced from the Philippine Statistics Authority (PSA). Brent crude oil prices are obtained from the Federal Reserve Economic Data (FRED) database. The country-specific OPU index is originally constructed at the monthly frequency using Philippine newspaper articles. It is aggregated to quarterly observations by taking the simple average of the monthly index within each quarter. Likewise, monthly Brent crude oil prices are aggregated using quarterly averages to ensure consistency with the frequency of the remaining macroeconomic variables. The frequency of the analysis is dictated by the BSP Consumer Expectations Survey, which is conducted quarterly.

**Table 4**
*Definition of Variables and Data Sources*

| Notations | Definition | Source |
|---|---|---|
| $opu$ | Country-specific oil price uncertainty index | Author's calculation |
| $brent$ | Brent crude oil price | FRED |
| $gdp$ | Real GDP growth | PSA |
| $\pi^e$ | Household inflation expectation | BSP CES |
| $\pi$ | Headline inflation | PSA |
| $i$ | Monetary policy rate | BSP |

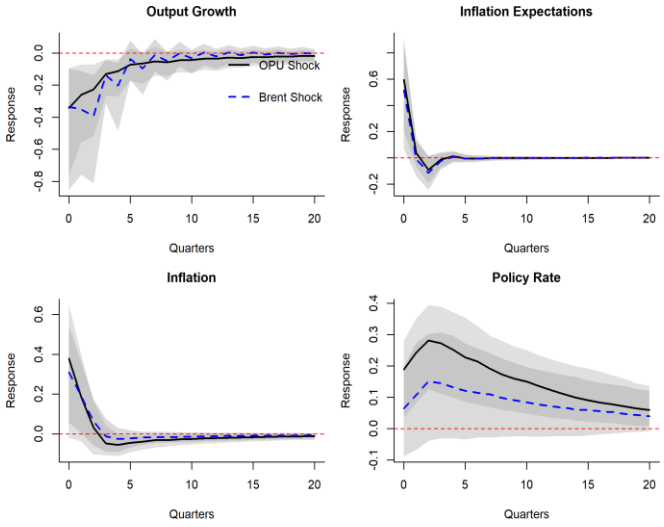
## Comparing the Macroeconomic Effects of Oil Price Uncertainty and Brent Crude Oil Price Shocks

This section compares the dynamic effects of OPU shocks and Brent crude oil price shocks using three complementary tools: impulse response functions (IRFs), forecast error variance decomposition (FEVD), and historical decomposition (HD). Examining the two identification schemes within a unified framework allows the analysis to assess whether uncertainty surrounding future oil prices conveys additional information beyond realized changes in oil prices**.**

### Impulse Response Analysis

Figure 8 compares the impulse responses of output growth, household inflation expectations, headline inflation, and the policy rate following an identified OPU shock and a Brent crude oil price shock. Overall, both shocks generate qualitatively similar responses for output growth, inflation expectations, and headline inflation, suggesting that realized oil price movements and oil price uncertainty operate through common transmission channels. However, important differences emerge in the magnitude and persistence of the responses, particularly for monetary policy.

**Figure 8**
*Impulse Response of Macroeconomic Variables on Brent and Oil Price Uncertainty Shock*




Both shocks produce an immediate decline in output growth, with the contraction dissipating after approximately five quarters. The similarity of the output responses suggests that both realized oil price increases and uncertainty surrounding future oil prices temporarily weaken economic activity by raising production costs and reducing aggregate demand. Consistent with the precautionary behavior emphasized in the uncertainty literature, firms may postpone investment, while households delay discretionary consumption, as uncertainty about future energy prices increases.

Household inflation expectations increase immediately after both shocks, then gradually return to their long-run equilibrium. The close correspondence between the two impulse responses suggests that households incorporate both realized oil price increases and uncertainty regarding future oil market developments when forming inflation expectations. Likewise, headline inflation rises on impact under both identification schemes, indicating that increases in energy costs—whether realized or anticipated through heightened uncertainty—are transmitted relatively quickly to domestic prices.

The most important difference between the two identification schemes lies in the response of the policy rate. Following an oil price uncertainty shock, the policy rate increases substantially more than after a Brent crude oil price shock and remains elevated over a considerably longer horizon. This result suggests that the BSP responds more strongly to uncertainty surrounding future oil prices than to realized oil price increases alone. One possible explanation is that heightened oil price uncertainty increases the likelihood of persistent inflationary pressures and second-round effects on inflation expectations, thereby requiring a more sustained monetary policy response.

**Forecast Error Variance Decomposition**

Although the impulse responses describe the dynamic effects of the identified shocks, the FEVD evaluates their quantitative importance in explaining macroeconomic fluctuations. Table 5 compares the proportion of forecast error variance explained by OPU shocks with that explained by Brent crude oil price shocks across different forecast horizons.

**Table 5**

*Forecast Error Variance Explained by OPU and Brent Crude Oil Price Shocks (%)*

| Variable | $h_1$ | $h_4$ | $h_8$ | $h_{12}$ | $h_{20}$ |
|---|---|---|---|---|---|
| Output Growth | 0.20 | 0.6 | 0.6 | 0.7 | 0.7 |
| | (0.20) | (0.6) | (0.6) | (0.6) | (0.6) |
| Inflation Expectations | 20.9 | 23.2 | 23.0 | 22.9 | 22.9 |
| | (12.7) | (14.2) | (13.6) | (13.6) | (13.6) |
| Inflation | 33.2 | 35.5 | 36.7 | 38.0 | 38.0 |
| | (10.6) | (11.5) | (12.0) | (12.2) | (12.8) |
| Policy Rate | 55.9 | 68.1 | 67.3 | 65.7 | 61.1 |
| | (8.7) | (11.6) | (13.0) | (12.3) | (12.5) |

Notes: The first number in each cell reports the percentage of forecast error variance explained by the Oil Price Uncertainty (OPU) shock. The value in parentheses reports the corresponding contribution of the Brent crude oil price shock. Forecast horizons are measured in quarters.

For output growth, both shocks explain only a negligible proportion of the forecast error variance throughout the forecast horizon, indicating that neither shock is a major source of output fluctuation. The contribution of both shocks remains below 1% even at longer horizons.

More substantial differences emerge for the nominal variables. Oil price uncertainty shocks explain approximately 23%–27% of the forecast error variance of household inflation expectations, compared with only 13%–14% for Brent crude oil price shocks. Similarly, oil price uncertainty shocks account for between 33% and 38% of the variation in headline inflation, approximately three times the contribution of Brent shocks. These results indicate that uncertainty surrounding future oil prices contributes more to inflation dynamics than realized oil price movements themselves.

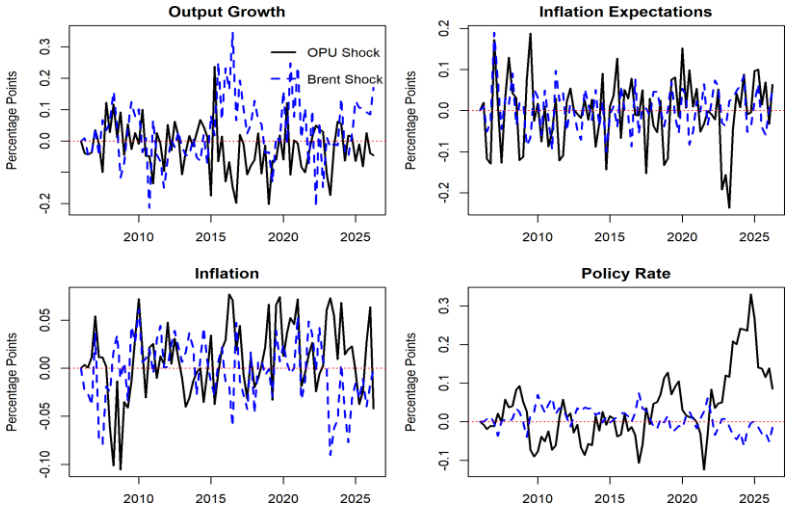
The largest difference is observed for the monetary policy rate. Oil price uncertainty shocks explain between 56% and 68% of the forecast error variance across forecast horizons, whereas Brent crude oil price shocks account for only 9% to 13%. The persistence of this gap across all horizons indicates that oil price uncertainty is a substantially more important determinant of monetary policy than realized changes in oil prices. Combined with the impulse response analysis, these findings suggest that the BSP responds not only to observed inflationary pressures but also to uncertainty regarding the future path of global oil prices.

**Historical Decomposition**

Figure 9 presents the historical decomposition (HD) implied by the two identification schemes. The HD provides an additional assessment of the relative importance of oil price uncertainty shocks and Brent crude oil price shocks by tracing their contributions to the historical evolution of the macroeconomic variables. The decomposition reveals that the contribution of oil price

uncertainty shocks becomes particularly pronounced during major episodes of geopolitical uncertainty, including the Russia–Ukraine conflict and the recent escalation of tensions in the Middle East. During these episodes, oil price uncertainty shocks account for considerably larger movements in household inflation expectations, headline inflation, and especially the policy rate than Brent crude oil price shocks. In contrast, Brent shocks generally explain smaller and less persistent fluctuations in these variables. The policy-rate decomposition is particularly informative. Beginning around the post-pandemic inflation episode, oil price uncertainty shocks account for a substantially larger proportion of policy rate movements than Brent crude oil price shocks. This pattern is consistent with both the impulse response analysis and the FEVD, which indicate that uncertainty surrounding future oil prices exerts a stronger and more persistent influence on monetary policy than realized oil price increases.

**Figure 9**
*Historical Decomposition of OPU and Brent Price Shocks*




Taken together, the impulse response analysis, forecast error variance decomposition, and historical decomposition provide mutually reinforcing evidence that oil price uncertainty represents a distinct and economically important transmission channel. Although both oil price uncertainty shocks and Brent crude oil price shocks generate similar qualitative responses of output growth, inflation expectations, and headline inflation, oil price uncertainty shocks consistently exert larger and more persistent effects on monetary policy. The consistency of these findings across three complementary empirical approaches strengthens the conclusion that uncertainty surrounding future oil prices contains substantially more information for macroeconomic dynamics than realized oil price movements alone.

## Conclusion

This paper develops a country-specific OPU index for the Philippines and examines its implications for household inflation expectations, inflation, output growth, and monetary policy. The results show that oil price uncertainty is an important transmission channel through which

external energy-market developments affect the Philippine economy. In particular, OPU shocks raise household inflation expectations and headline inflation while temporarily weakening output growth. The findings also indicate that oil price uncertainty shocks have stronger and more persistent effects on the policy rate than realized Brent crude oil price shocks. Forecast error variance decompositions and historical decompositions further show that oil price uncertainty explains a larger share of fluctuations in inflation expectations, inflation, and monetary policy, especially during periods of heightened geopolitical risk. These results suggest that uncertainty about the future path of oil prices contains information beyond actual oil price movements and should be closely monitored in the conduct of monetary policy. Overall, the evidence highlights the importance of distinguishing between realized oil price shocks and uncertainty surrounding future oil prices. For an oil-importing economy such as the Philippines, incorporating oil price uncertainty into inflation monitoring and policy analysis may help improve assessments of inflation risks and the formation of household expectations.

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