Hedging Oil Shocks in Monetary Policy

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Significant fluctuations in crude oil prices draw attention from policymakers, academics, and practitioners. These fluctuations often arise from global demand changes, supply disruptions, or precautionary motives, prompting critical questions about monetary policy responses. Understanding the interplay between oil shocks and monetary policy requires examining central bank actions and their economic impacts. This study investigates monetary policy responses to oil shocks since the 1990s using Structural Vector Autoregression, Impulse Response Functions, and Variance Decomposition. These methods reveal dynamic relationships between crude oil prices, inflation rates, and monetary policy rates. The findings highlight distinct responses among countries. Major oil importers like the U.S. and China significantly raise policy rates in response to oil shocks, while Japan shows a more modest reaction. Among oil-exporting nations, Saudi Arabia and Canada respond swiftly and substantially, whereas Nigeria adopts an unconventional approach, loosening monetary policy after an oil shock. These variations underscore the complex interactions between oil prices and monetary policy globally.

Keywords: oil shocks, monetary policy, structural break, structural vector autoregression, impulse response function, variance decomposition

INTRODUCTION

Oil shocks are widely recognized as infrequent but costly events with substantial recovery implications. However, the macroeconomic impact of fluctuations in oil prices is not uniform. When increases in oil demand and crude oil prices stem from robust domestic or foreign aggregate demand, global economic activity generally expands rather than contracts. This contrasts with scenarios where price increases result from disruptions in foreign oil supply, which typically lead to economic contraction. Historically, there has been a prevailing belief that exogenous political events in the Middle East precipitate recessions in industrialized countries by influencing oil prices, supported by a strong statistical correlation between Middle Eastern political events and recessions in the U.S. Bodenstein et al. (2012) underscore a significant challenge in quantifying the relationship between central bank actions and economic outcomes due to the lack of consensus on how to measure changes in monetary policy. Bernanke and Mihov (1998) anticipated that traditional methods equating monetary policy changes with money supply variations are inadequate due to the influence of non-policy factors on monetary aggregates. The global financial crisis of 2008-2009 further highlighted the importance of systemic risk, emphasizing that financial stability relies critically on the interrelationships among financial system components. The impact of crude oil price fluctuations has introduced new considerations into policy discussions, prompting debates on whether inflation-targeting frameworks should be adjusted to incorporate macroprudential policies in the presence of oil shocks.

Notably, oil demand among Organization for Economic Co-operation and Development (OECD) countries is expected to decline over the forecast period due to government policies promoting fuel efficiency and high vehicle ownership rates. Conversely, non-OECD Asia, particularly China, is projected to grow oil demand, partly due to increasing oil consumption and strategic reserve accumulation. Despite recognizing oil shocks as a significant concern for cost-push inflation, their effects on aggregate supply offer valuable insights into economic management during periods of restrained sectoral spending. This paper explores the effectiveness of monetary policy responses to cost-push inflation caused by oil shocks and evaluates optimal monetary policy design in major oil-importing and -exporting countries. Utilizing a Structural Vector Autoregression (SVAR) model, the study examines the dynamic relationships between crude oil prices, inflation rates, and monetary policy rates. The impulse response functions (IRFs) derived from the SVAR model are analyzed to assess the impact of fluctuations in endogenous variables on each other, while Variance Decomposition (VD) is used to determine the proportion of variability in endogenous variables attributable to their own shocks versus those of other variables in the system. The findings indicate that the U.S. and China adjust their interest rate policies more significantly and rapidly in response to oil shocks compared to Japan. Similarly, Saudi Arabia and Canada exhibit pronounced and swift reactions to changes in oil prices, whereas Nigeria adopts a less conventional monetary policy approach. The subsequent sections of this paper will address these issues in detail: Section 1 provides an overview of oil shocks and their economic impacts, Section 2 reviews the relevant literature, Section 3 presents an empirical analysis of monetary policy responses to oil shocks, and Section 4 concludes with a discussion of policy implications and final remarks.

Oil Shocks and the Economy in Brief

The concept of an "oil shock" is pivotal in analyzing its economic implications, as it can manifest as either a positive or negative occurrence. A negative oil shock is characterized by a sudden and substantial reduction in oil supply, resulting in a sharp increase in oil prices. Such disruptions may arise from various factors, including geopolitical conflicts, natural disasters, supply chain bottlenecks, or intentional output restrictions by major oil producers. The economic repercussions of a negative oil shock are extensive. Firstly, production costs escalate since oil is a fundamental input across numerous industries. Rising oil prices increase costs throughout the economy, often resulting in inflation as businesses transfer these expenses to consumers. Secondly, elevated oil prices curtail consumer spending, particularly on non-essential goods, as households allocate more of their income to energy-related expenses, such as gasoline and heating. This shift ultimately leads to a decline in aggregate demand.

Additionally, the increased energy costs can slow overall economic activity, particularly in oil-importing countries that are especially susceptible to such shocks. These nations often experience higher inflation and sluggish growth, a situation frequently described as stagflation. The trade balances of oil-importing countries may deteriorate as their expenditures on oil imports rise, weakening their currencies. In contrast, oil-exporting countries may experience improved trade balances; however, the inflationary pressures resulting from rising prices could diminish some of these benefits. Central banks frequently encounter challenging trade-offs during negative oil shocks. The upward pressure on inflation may necessitate an increase in interest rates, but such measures could further suppress economic growth. Historically, negative oil shocks have been associated with economic recessions, notably during the oil crises of the 1970s. Policymakers thus face the complex task of balancing inflation control with the need to sustain economic growth. For example, during the Gulf War in late 1990, oil prices surged to $79.94 (adjusted to 2020 prices) due to production disruptions. Similarly, between 2007 and 2008, the surge in global oil demand outpaced supply, driven largely by major emerging economies. Hamilton (2010) underscores that during this period, global oil consumption increased by 5 million barrels per day, contributing to a consistent price rise. Long story short, at the microeconomic level, rising crude oil prices lead to higher fuel costs, compelling households to allocate a greater share of their budgets to energy and resulting in decreased spending on other goods and services. At the macroeconomic level, heightened oil prices elevate transportation and production costs, contributing to inflation and decelerating economic growth across various sectors.

Conversely, a positive oil shock denotes a sudden increase in oil supply or a significant decline in oil prices, often driven by technological advancements in extraction methods, geopolitical stability in oil-producing regions, or the discovery of new oil reserves. This increase in oil supply generally results in lower energy costs, stimulating economic activity by reducing business production costs and enhancing disposable income for consumers. Consequently, consumers will likely increase their expenditures on goods and services, thereby boosting aggregate demand. Additionally, lower oil prices can improve the trade balances of oil-importing countries, while oil-exporting countries may benefit from heightened demand for their products. In summary, a positive oil shock can foster economic growth, lower inflation rates, and enhance consumer and business confidence.

This paper will focus primarily on the implications of negative oil shocks while incorporating an analysis of monetary policy tools designed to mitigate the inflationary effects experienced by major oil-importing and oil-exporting countries.

LITERATURE REVIEW

A considerable body of literature has examined the importance of oil prices on economic activities and market returns. One of the central questions in recent macroeconomic history is to what extent monetary policy, as opposed to oil price shocks, contributed to the stagflation of the 1970s. Understanding the dynamics of the 1970s is essential for learning from past policy failures (Kilian, 2009a). The persistently high oil prices have consistently placed significant pressure on monitoring recessions, periods of excessive inflation, reduced productivity, and lower economic growth. There is a widespread belief that exogenous political events in the Middle East since the 1970s have caused recessions in industrialized countries through their impact on oil prices. Empirical evidence supports a close statistical relationship between political events in the Middle East and recessions in the U.S. For instance, while the November 1973 recession in the U.S. coincided with the start of the oil embargo, there was a notable delay between the Iranian revolution and the January 1980 recession, and between the outbreak of the Iran-Iraq war and the July 1981 oil spike. While price stability is widely accepted as the key objective of monetary policy, Kilian (2009b) argues that central banks must identify the extensive causes of oil price shocks and respond to the underlying fundamental shocks. The oil price increases of the 1970s were driven significantly by a shift in the monetary policy regime, but not all oil price shocks are attributable to monetary policy shifts. Kilian asserts that recent oil price shocks were driven not by monetary policy shifts in OECD economies as in the 1970s, but by structural economic changes in emerging Asia. The monetary expansions since 2001 were not associated with an overheating domestic economy; the credit crunch mitigated the effect of the 2003-2008 monetary expansion. The fundamental issue was oil demand growing faster than oil supplies, leading to substantial increases in industrial commodity prices, with the real price of crude oil more than quadrupling during 2003-2008. Kilian and Hicks (2011) provide evidence that the surge in the real price of oil is primarily explained by rising global demand for industrial commodities driven by unexpected economic growth. Measuring the scale of the monetary policy stance is complex. To address this, Bernanke and Mihov (1998) developed a Vector Auto Regression (VAR) methodology for measuring innovations in monetary policy and their macroeconomic effects, avoiding reliance on money growth stock. They proposed a semi-structural VAR model that imposes contemporaneous identification restrictions on variables relevant to the commercial bank reserves market. The model includes policy variables (total bank reserves, non-borrowed reserves, and the federal funds rate) and non-policy variables (real GDP, the GDP deflator, and the Dow Jones index of spot commodity prices) for 1965-1996. They recommend using a model of the bank reserves market to incorporate potential changes in reserve market structure and federal system operating procedures, which can be generalized to other countries or periods to measure overall monetary conditions. Building on the work of Bernanke and Mihov (1998), this paper incorporates supplementary variables such as policy rate, inflation rate, and crude oil price to evaluate the monetary policy stance of major oil-importing and -exporting countries. Utilizing the Structural Vector Auto Regression (SVAR) framework, this study aims to provide a comprehensive policy discussion to address crises caused by oil shocks.

Monetary Policy Responses to Oil Shocks With Empirical Analysis

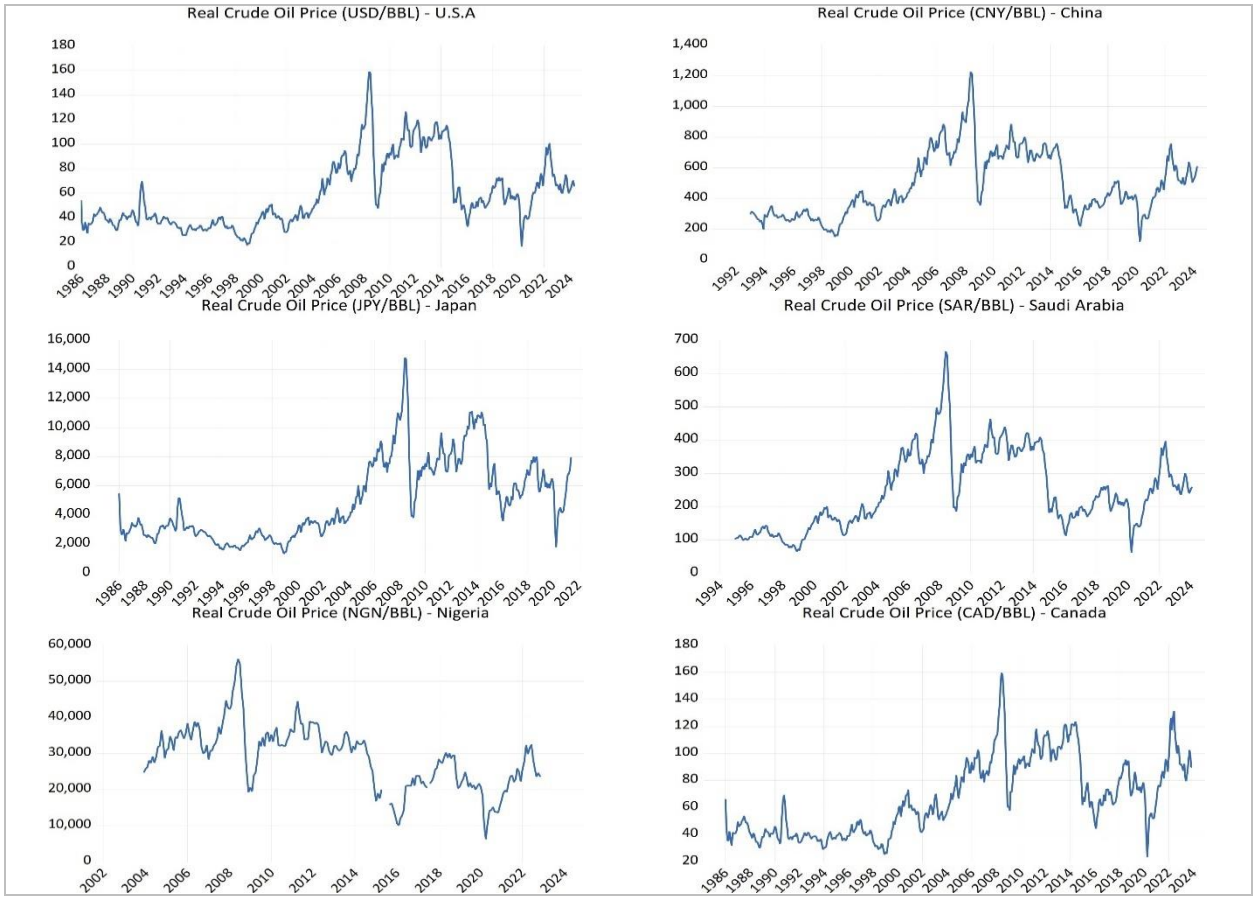
To commence, this study examines major oil-importing and oil-exporting countries, as identified by the Observatory of Economic Complexity (OEC)—a data visualization and analysis platform developed by the MIT Media Lab, which provides insights into global trade dynamics and economic complexity. According to 2022 OEC data, the leading importers of crude oil are U.S.A. ($199 billion), China ($287 billion), and Japan ($86.7 billion), while the principal exporters are Saudi Arabia ($236 billion), Nigeria ($52.1 billion), and Canada ($123 billion).

To advance the analysis, the identification of structural breaks in the monthly oil price series from 1986 to the present is undertaken. This involves examining a univariate time series of real crude oil prices to pinpoint a structural break, thereby allowing the model's coefficients to change post-break date. Denoting the break date as T_b, and defining D_t as 0 before T_b and 1 after T_b, the model is formulated as shown in Equation 1.

$$p_t = \beta_0 + \beta_1 p_{1t} + \beta_2 p_{2t} + \gamma D_t + \delta (D_t.p_{1t}) + \varepsilon_t \quad (1)$$

Adjustments were made to identify structural breaks in the real oil price series for various countries' exchange rate and consumer price index. The analysis yields the real price of oil expressed in local currency terms. The trajectory of real crude oil prices across these countries is depicted in Figure 1.

FIGURE 1
REAL CRUDE OIL PRICE TRAJECTORY OF MAJOR OIL-IMPORTING AND EXPORTING COUNTRIES



Source: FRED and Author's Calculation (June, 2024) - Monthly Data

The analysis identifies the following structural breaks in the data for various countries: for U.S.A., structural breaks are observed on September 1, 1990; August 1, 2008; and August 1, 2014. Structural breaks are detected in China on August 1, 2008, and August 1, 2014. Japan experiences structural breaks on August 1, 2008, and October 1, 2014. Saudi Arabia shows structural breaks on July 1, 2008, and August 1, 2014. Nigeria's data exhibits structural breaks on August 1, 2008, and July 1, 2024. And for Canada, structural breaks are recorded on November 1, 1990; August 1, 2008; and August 1, 2014. These structural breaks align with significant real-world events, such that: the structural break on September 1, 1990, corresponds to the crude oil price shock triggered by the Gulf War, which followed Iraq's invasion of Kuwait. The structural break on August 1, 2008, is associated with the crude oil price shock driven by heightened demand from emerging markets and geopolitical tensions. And, the structural break on August 1, 2014, reflects the crude oil price crash resulting from a surge in oil production, particularly from the U.S., coupled with the Organization of the Petroleum Exporting Countries (OPEC)'s decision to maintain production levels.

Next, the data formatting process is necessary due to the time series nature of the data and its exhibited trending behavior or non-stationarity in the mean, as observed with variables such as the inflation rate, the real crude oil price, and the policy interest rate. To address this, a trend removal or de-trending procedure is essential. Specifically, log differencing ($\Delta\log(.)$) is applied to the real crude oil price series and the consumer price index series, while differencing (Δ) is utilized for the interest rate series. This approach enables the series to approximate a white noise process, thus satisfying the stability condition. Following this, the SVAR processes are to be implemented. SVAR analysis, as discussed in this section, is optimally conducted within the framework of estimating systems of simultaneous equations. The structural representation of the SVAR model is introduced in Equation 2 below.

$$\mathbf{B}Y_t = \Gamma_0 + \Gamma_1 Y_{t-1} + \ldots + \varepsilon_t \tag{2}$$

where $\varepsilon \sim i.i.d.D(0, \Sigma)$ is structural errors, and Σ is a diagonal matrix.

$$Y_t = \begin{bmatrix} \Delta\log(ROIL_t) \\ \Delta\log(CPI_t) \\ \Delta INTR_t \end{bmatrix}$$

I apply equality constraints using constraint matrices to impose the Cholesky restrictions on this system. Specifically, I construct **B** as a lower triangular matrix. This matrix **B** will facilitate the application of the Cholesky decomposition, which is essential for ensuring that the structural shocks in the SVAR model are uncorrelated and that the system's identification constraints are properly enforced.

$$\mathbf{B} = \begin{bmatrix} . & 0 & 0 \\ . & . & 0 \\ . & . & . \end{bmatrix}$$

Under the specified structural restrictions, the model assumes that in the crude oil price equation, the crude oil price is not contemporaneously influenced by inflation or federal funds rate changes. This assumption is based on the understanding that crude oil prices are predominantly driven by supply-side factors, including decisions made by oil producers such as OPEC and external factors like natural disasters and political instability in oil-producing regions, which can disrupt oil production. Conversely, the inflation equation assumes that the inflation rate is influenced only by changes in the crude oil price and not by the federal funds rate. This is grounded in the idea that high crude oil prices can increase consumer spending on fuel, thereby reducing disposable income for other goods and services. Furthermore, rising transportation costs can directly impact households and businesses that rely heavily on logistics, contributing to a general increase in the price level. Sawyer (2008) supports this view, suggesting that central banks adjust policy interest rates primarily to manage inflationary expectations rather than to directly influence the inflation rate; therefore, the inflation rate may not exhibit a direct response to changes in the policy interest rate.

Finally, the model imposes no restrictions on the interest rate equation, allowing the federal funds rate to be influenced by both the crude oil price and the inflation rate. This approach aims to examine how variations in crude oil prices and inflation rates might lead to adjustments in interest rate policy, which is crucial for understanding how monetary policy can effectively respond to oil shocks.

It is important to note that the policy rates used to gauge the monetary policy stance in various countries are as follows: the federal funds rate (*FFR*) for U.S.A., the reserve requirement ratio (*RRR*) for China, the policy rate (*PR*) for Japan, the repo rate (*RP*) for Saudi Arabia, the monetary policy rate (*MPR*) for Nigeria, and the overnight rate (*ONR*) for Canada.

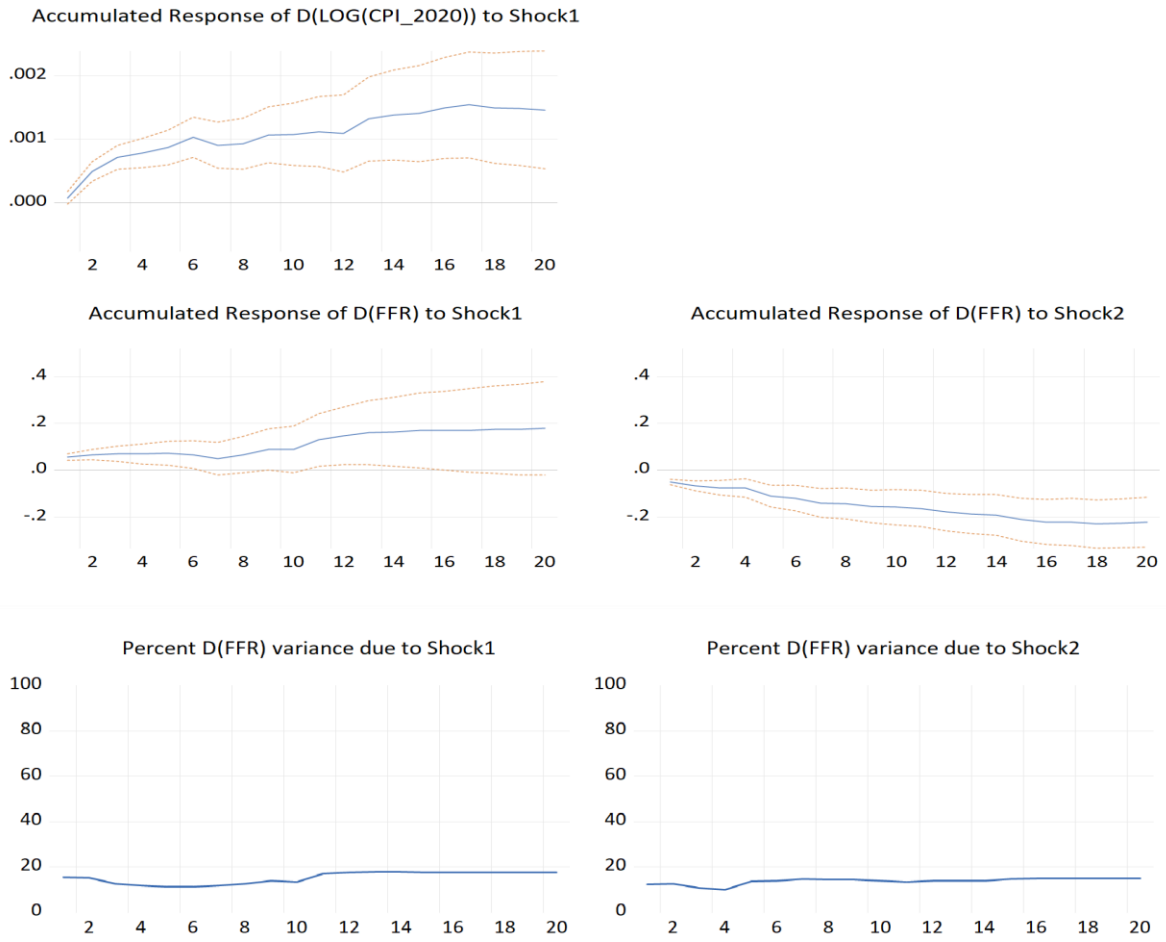
Major Oil-Importing Countries

In this analysis, I present and examine the dynamic marginal effects of each shock on all variables over time, utilizing the Impulse Response Functions (IRFs) obtained from the Structural Vector Autoregression (SVAR) model across various structural breaks. The SVAR model includes three variables, so the IRFs are represented as 3 × 3 matrices. However, the presentation will focus on the findings pertinent to the constraints imposed in the **B** matrix. It is important to note that the study for U.S.A. is based on the structural break dates of September 1, 1990; August 1, 2008; and August 1, 2014. For China, the analysis is centered on the break dates of August 1, 2008; and August 1, 2014. For Japan, the structural break dates are August 1, 2008; and October 1, 2014.

Structural Break of 1990

In examining the structural break of 1990, as shown in Figure 2, the IRF for U.S.A. reveals the following: When the impulse variable is the real crude oil price and the response variable is the inflation rate, all IRFs are statistically significant, with a one standard deviation shock to real crude oil prices leading to a maximum increase in the inflation rate of up to 0.15%. When the impulse variable is the real crude oil price and the response variable is the interest rate, the IRFs are significant for most periods, indicating that a one standard deviation shock to real crude oil prices results in a sustained increase in the federal funds rate, reaching up to 17.14%. However, when the impulse variable is the inflation rate and the response variable is the interest rate, none of the IRFs are statistically significant, and the federal funds rate exhibits an unconventional downward trend. The variance decomposition shows that the real crude oil price has a greater impact than the inflation rate on the variability of the federal funds rate, explaining up to 17.76% of the variability over time.

FIGURE 2
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, U.S.A., SB OF 1990M9

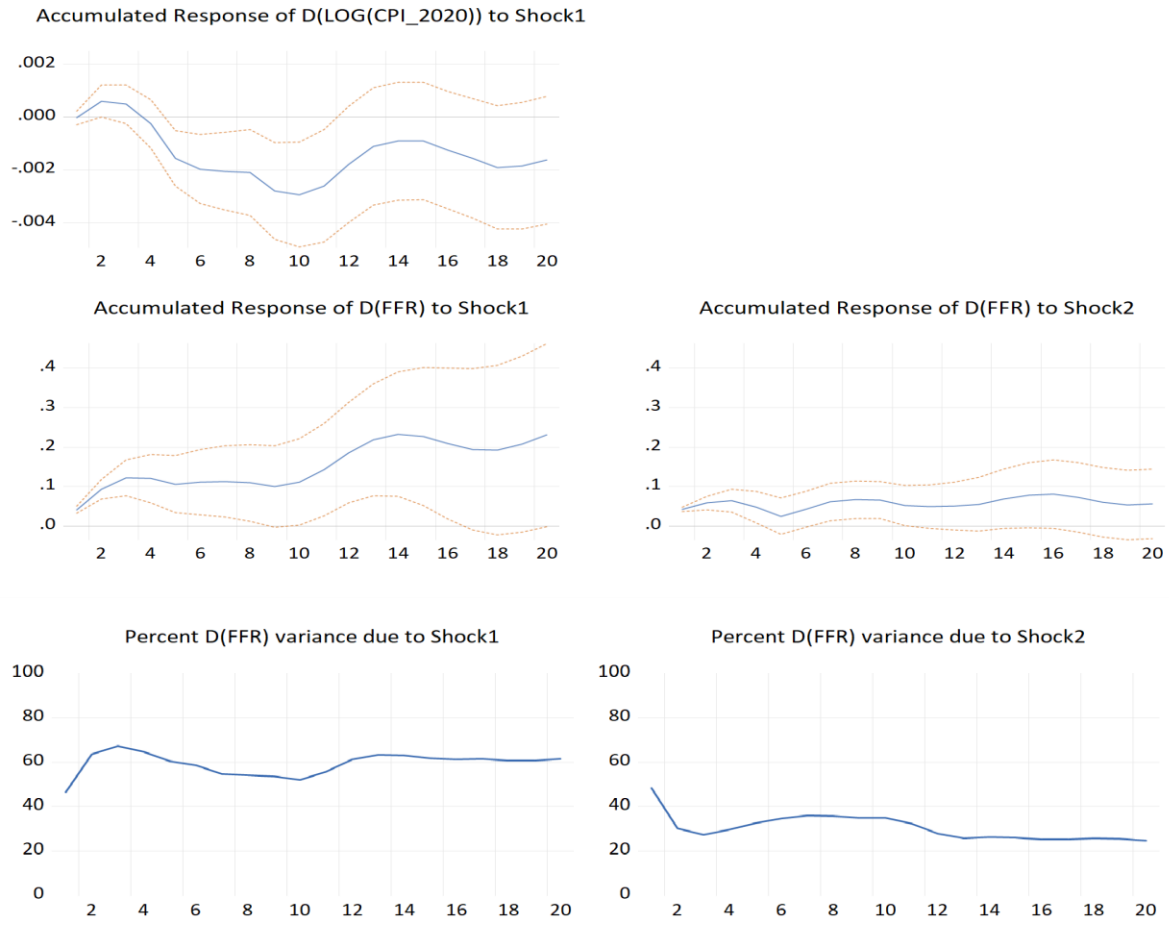


Note: FFR is the Federal Funds Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

Structural Break of 2008

In analyzing the structural break of 2008, as shown in Figure 3, the IRF for U.S.A. reveals the following: When the impulse is the real crude oil price and the response is the inflation rate, none of the IRFs are statistically significant, indicating an unconventional pattern where the inflation rate trends downward in response to oil price shocks. Conversely, when the impulse is the real crude oil price and the response is the interest rate, the IRF is significant for most periods, suggesting a one standard deviation shock to real crude oil prices results in a persistent increase in the federal funds rate, up to 23.25%. When the impulse is the inflation rate and the response is the interest rate, the IRF is significant in some periods, indicating a one standard deviation shock to inflation leads to a persistent rise in the federal funds rate, up to 6.64%. According to the variance decomposition, the real crude oil price has a greater impact than the inflation rate on the variability of the federal funds rate, explaining up to 67.16% of the variability by the third month.

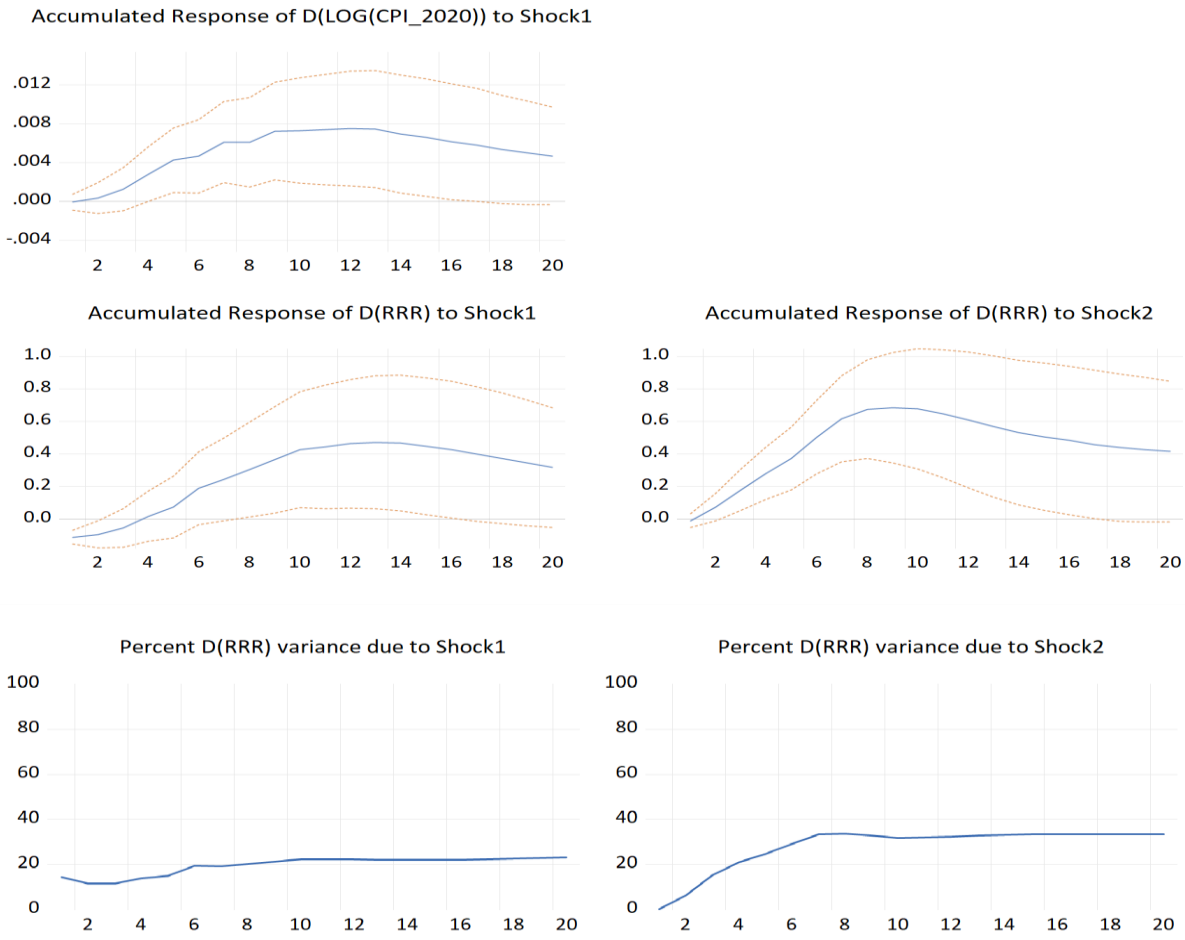
FIGURE 3
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, U.S.A., SB OF 2008M8



Note: FFR is the Federal Funds Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

As shown in Figure 4, the IRF for China reveals the following: When the impulse is the real crude oil price and the response is the inflation rate, the IRF is significant across most periods, indicating that a one standard deviation shock to real crude oil prices results in a persistent and gradual increase in the inflation rate, reaching up to 0.75%. Conversely, when the impulse is the real crude oil price and the response is the interest rate, the IRF is significant only in later periods, showing that a one standard deviation shock to real crude oil prices leads to a sustained and gradual increase in the reserve requirement ratio, up to 47.26%. Furthermore, when the impulse is the inflation rate and the response is the interest rate, the IRF is significant in most periods, with a one standard deviation shock to inflation resulting in a persistent increase in the reserve requirement ratio, reaching up to 68.44%. The variance decomposition indicates that the inflation rate has a more significant effect than the real crude oil price on explaining the variability of the reserve requirement ratio over time, accounting for up to 33.33%.

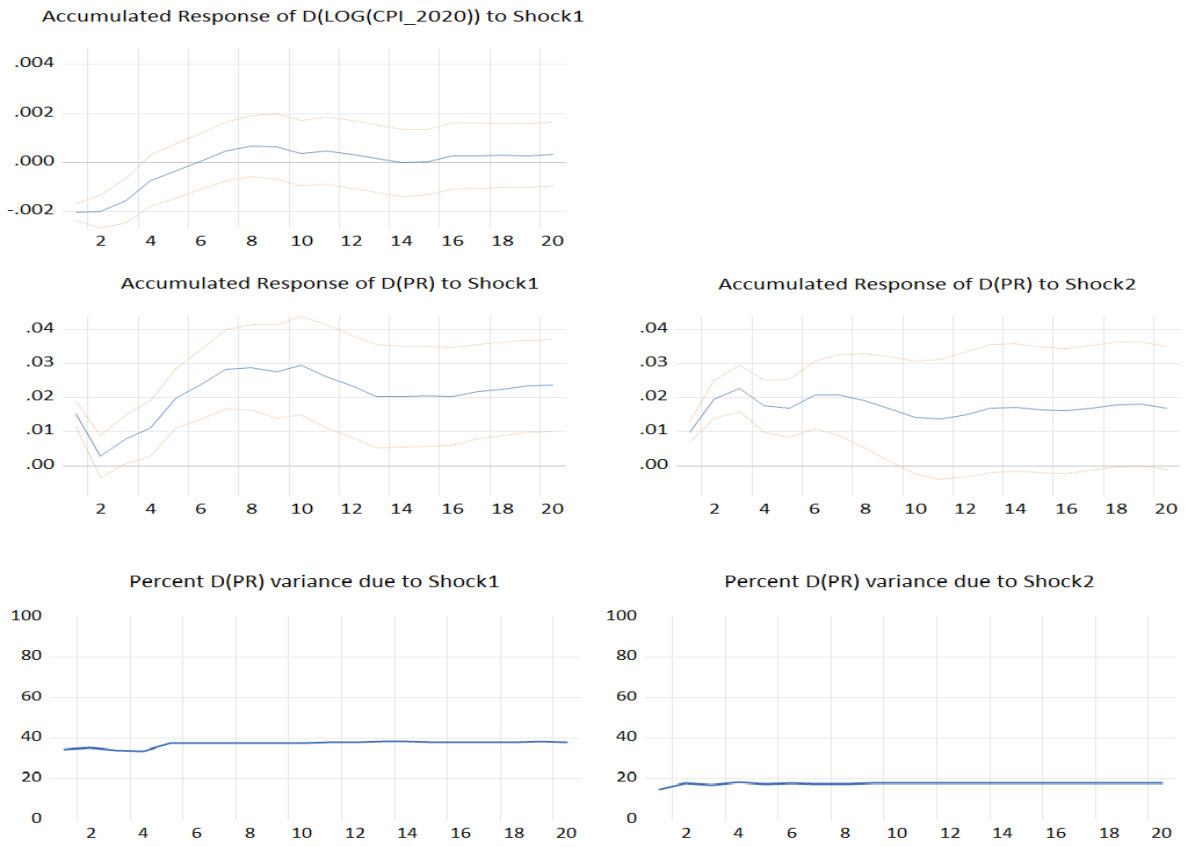
FIGURE 4
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, CHINA, SB OF 2008M8



Note: RRR is the Reserve Requirement Ratio.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

As shown in Figure 5, the IRF for Japan is analyzed as follows: When the impulse is the real crude oil price and the response is the inflation rate, none of the IRFs are statistically significant, suggesting that while a shock to the real crude oil price may lead to an increase in the inflation rate, the effect is not significant. Conversely, when the impulse is the real crude oil price and the response is the interest rate, the IRF is significant across most periods. This indicates that a one standard deviation shock to the real crude oil price leads to a gradual and persistent increase in the policy rate, reaching up to 2.62%. When the impulse is the inflation rate and the response is the interest rate, the IRF is significant in the early periods, showing that a one standard deviation shock to the inflation rate results in a persistent increase in the policy rate, up to 2.27%. Additionally, the variance decomposition reveals that the real crude oil price has a greater impact than the inflation rate on explaining the variability of the policy rate over time, accounting for up to 38.25%.

FIGURE 5
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, JAPAN, SB OF 2008M8

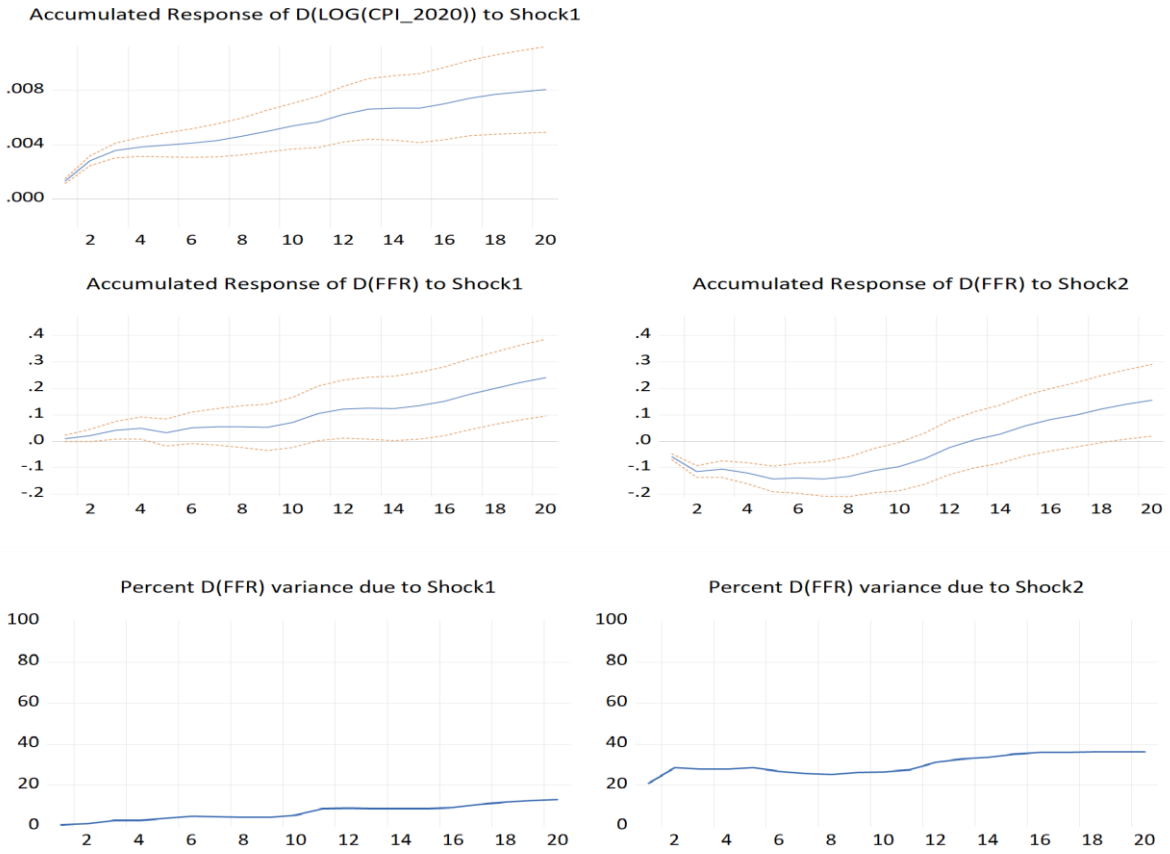


Note: PR is the Policy Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

Structural Break of 2014

In the analysis of the structural break of 2014, as shown in Figure 6, the IRF for U.S.A. is as follows: When the impulse is the real crude oil price and the response is the inflation rate, the IRF is significant across all periods, indicating that a one standard deviation shock to the real crude oil price leads to a persistent and gradual increase in the inflation rate, reaching up to 0.81%. When the impulse is the real crude oil price and the response is the interest rate, the IRF is significant in later periods, with a one standard deviation shock resulting in a gradual and sustained increase in the federal funds rate, peaking at 24.03%. Similarly, when the impulse is the inflation rate and the response is the interest rate, the IRF is significant in later periods, showing that a one standard deviation shock to the inflation rate leads to a persistent increase in the federal funds rate, reaching up to 15.56%. The variance decomposition indicates that the inflation rate has a greater effect than the real crude oil price in explaining the variability of the federal funds rate over time, with the inflation rate accounting for up to 28.45% of the variability in the federal funds rate by the second month.

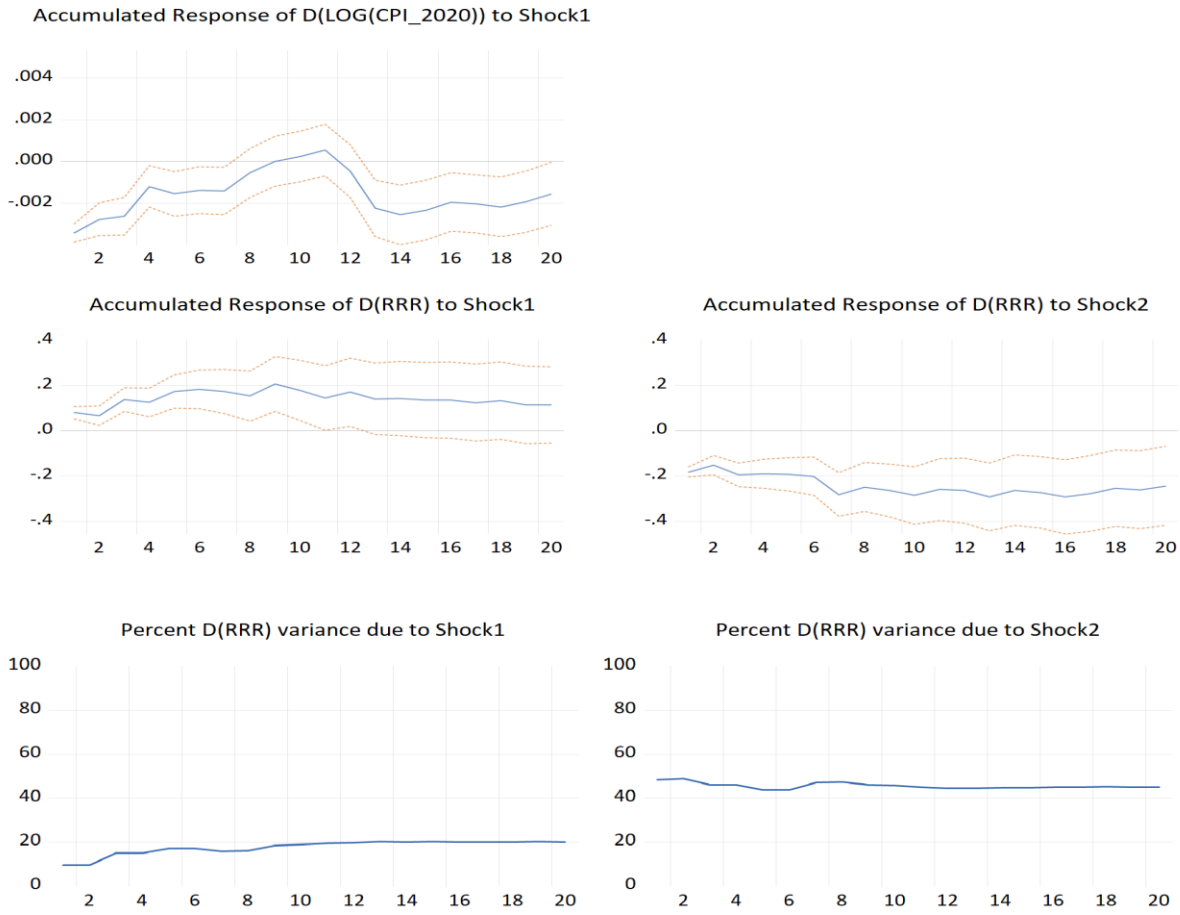
FIGURE 6
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, U.S.A., SB OF 2014M8



Note: FFR is the Federal Funds Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

As shown in Figure 7, the IRF for China is as follows: When the impulse is the real crude oil price and the response is the inflation rate, none of the IRFs are significant, indicating that the impact on the inflation rate is minimal and lacks a consistent pattern following a shock to the real crude oil price. Conversely, when the impulse is the real crude oil price and the response is the interest rate, the IRF is significant in the early periods. Specifically, a one standard deviation shock to the real crude oil price leads to a persistent and gradual increase in the reserve requirement ratio, reaching up to 20.70%. When the impulse is the inflation rate and the response is the interest rate, none of the IRFs are significant, suggesting that the impact of inflation rate shocks on the reserve requirement ratio is minimal and inconsistent. The variance decomposition reveals that the inflation rate has a greater effect than the real crude oil price in explaining the variability of the reserve requirement ratio over time, accounting for up to 47.13% of its variability by the eighth month.

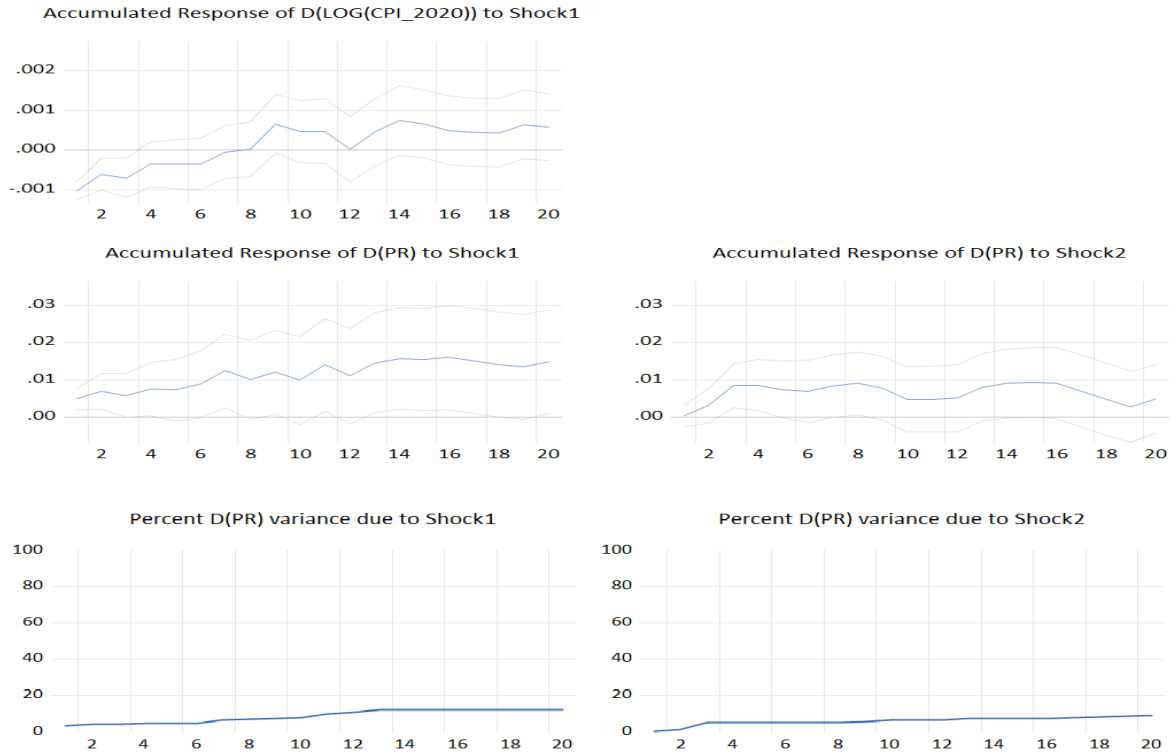
FIGURE 7
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, CHINA, SB OF 2014M8



Note: RRR is the Reserve Requirement Ratio.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

As presented in Figure 8, the IRF for Japan reveals the following: When the impulse is the real crude oil price and the response is the inflation rate, none of the IRFs are statistically significant, suggesting that the impact on the inflation rate may be minimal despite a shock in the real crude oil price. Conversely, when the impulse is the real crude oil price and the response is the interest rate, the IRF is significant in some periods. Specifically, a one standard deviation shock to the real crude oil price leads to a persistent and gradual increase in the policy rate, reaching up to 1.60%. When the impulse is the inflation rate and the response is the interest rate, the IRF is significant in some periods, with a one standard deviation shock to the inflation rate causing a gradual increase in the policy rate, peaking at 0.85% in the third month. The variance decomposition further indicates that the real crude oil price has a stronger effect than the inflation rate in explaining the variability of the policy rate over time, accounting for up to 12.25% of the variability.

FIGURE 8
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, JAPAN, SB OF 2014$_{M10}$



Note: PR is the Policy Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

In summary, the response of the inflation rate to real crude oil price shocks shows varying patterns across different structural breaks for U.S.A. During the 1990 break, the inflation rate exhibits a gradual, though not significant, increase in response to oil price shocks. In 2008, this response remains flat and negative. However, in 2014, the response becomes significant, showing a persistent increase in inflation, consistent with the expectation that higher real crude oil prices drive inflation. The impact of oil price shocks on the federal funds rate is notably higher in 2014 compared to 2008 and 1990, supporting the view that the Federal Reserve implements contractionary policy to address oil price shocks. The response of the federal funds rate to inflation rate shocks is unconventional in 1990 but becomes significantly more pronounced in 2014, reflecting an increase in the Fed response to inflationary pressures. Variance decomposition shows that, in 1990 and 2008, the federal funds rate variability is more influenced by oil price shocks, while in 2014, inflation rate shocks are more significant. For China, the inflation rate shows a noticeable impact from oil price shocks in 2008 but is insignificant in 2014, aligning with the expectation that oil shocks lead to increased inflation. The reserve requirement ratio responded significantly to oil price shocks in 2008, but less so in 2014, indicating substantial contractionary measures by the People's Bank of China (PBC) in response to oil price shocks. The reserve requirement ratio's response to inflation rate shocks is significant in 2008 but fluctuated in 2014, consistent with further contractionary policies in response to inflationary pressures. Variance decomposition reveals that in both 2008 and 2014, the reserve requirement ratio variability is primarily explained by inflation rate shocks. In Japan, the inflation rate shows minimal impact from oil price shocks in both 2008 and 2014, with only a slight increase. The policy rate, however, rises significantly in response to oil price shocks in 2008 compared to 2014, consistent with

the Bank of Japan (BOJ)'s contractionary policy stance. The BOJ's response to inflation rate shocks is more pronounced in 2008 than in 2014. Variance decomposition indicates that policy rate variability in Japan is attributed to oil price shocks in both 2008 and 2014.

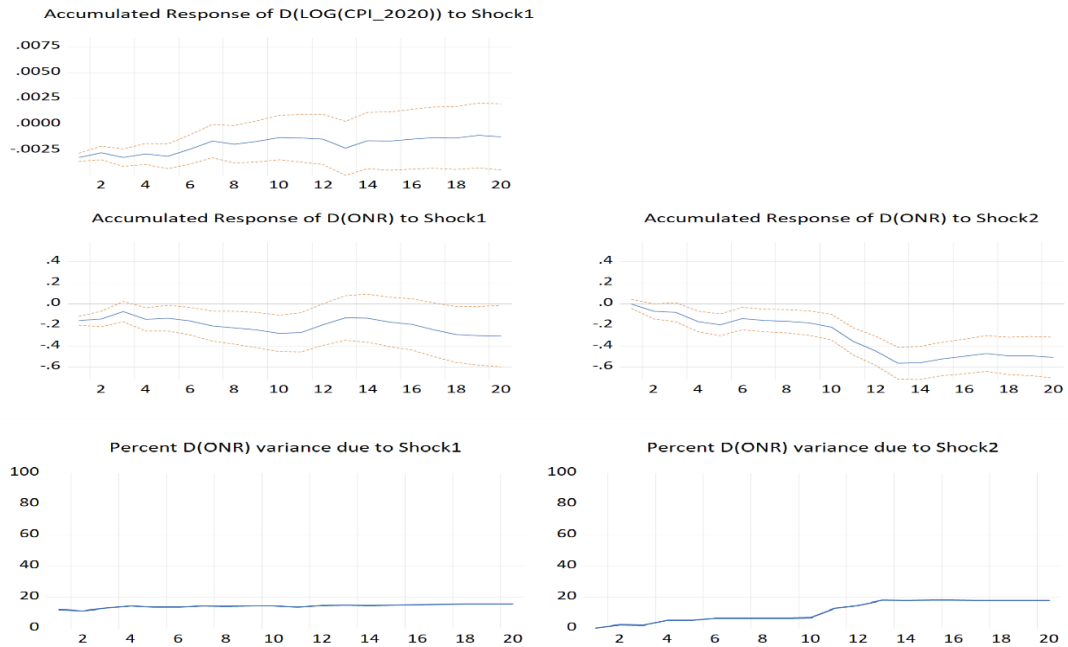
Major Oil-Exporting Countries

At this point, I will turn the discussion to the cases of major oil-exporting countries. It is important to note that the analysis for Saudi Arabia is based on the structural break dates of July 1, 2008, and August 1, 2014. For Nigeria, the study focuses on the structural break dates of August 1, 2008, and July 1, 2014. For Canada, the analysis includes the structural break dates of November 1, 1990, August 1, 2008, and August 1, 2014.

Structural Break of 1990

In the structural break of 1990, as shown in Figure 9, the IRF for Canada reveals the following: When the impulse is the real crude oil price and the response is the inflation rate, none of the IRFs are significant, suggesting an unconventional impact with the inflation rate exhibiting a negative slope in response to oil price shocks. Similarly, when the impulse is the real crude oil price and the response is the interest rate, none of the IRFs are significant, indicating an unconventional pattern with the overnight rate showing a negative slope in response to oil price shocks. Notably, a one standard deviation shock to the real crude oil price results in a significant and persistent reduction in the overnight rate by up to 26.96% in the eleventh month. When the impulse is the inflation rate and the response is the interest rate, none of the IRFs are significant, further suggesting an unconventional impact with the overnight rate fluctuating around a negative slope in response to inflation rate shocks. Variance decomposition shows that the real crude oil price has a stronger effect than the inflation rate on the variability of the overnight rate in the early periods, while the inflation rate explains up to 18.09% of the variability in later periods.

FIGURE 9
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, CANADA, SB OF 1990$_{M11}$

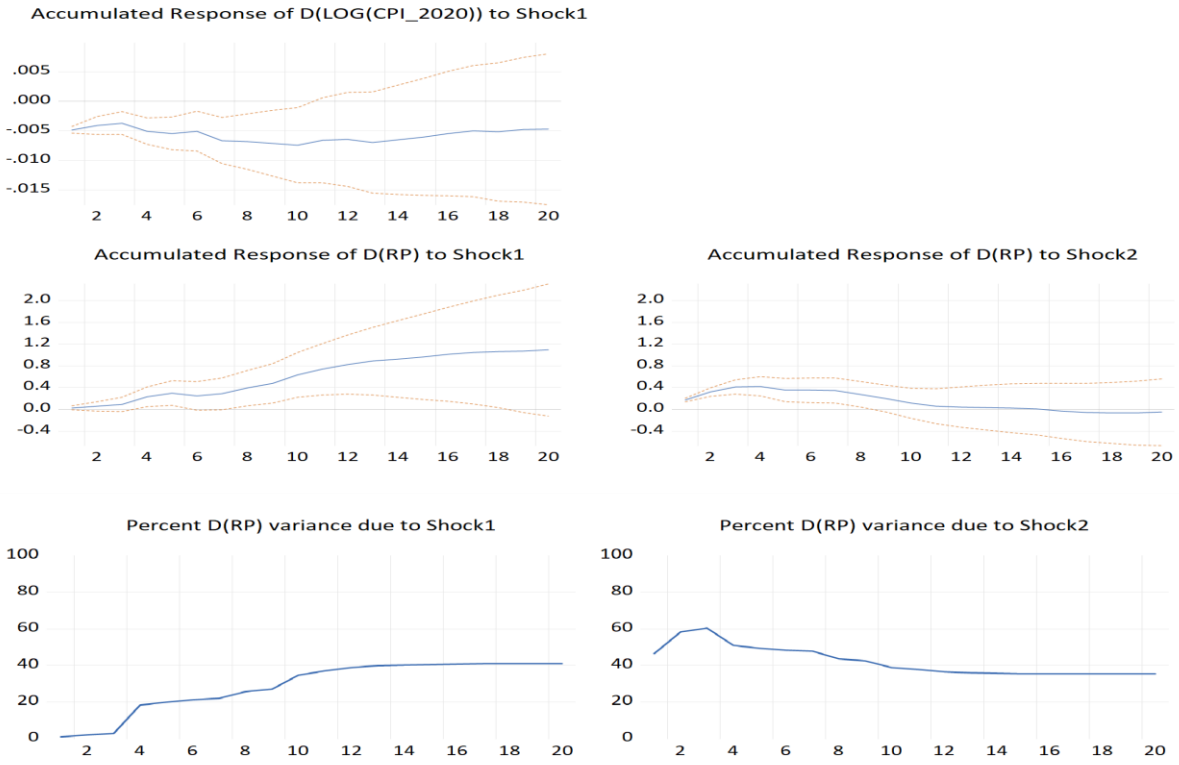


Note: ONR is the Overnight Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

Structural Break of August 2008

In the structural break of 2008, as depicted in Figure 10, the IRF results for Saudi Arabia are as follows: When the impulse is the real crude oil price and the response is the inflation rate, none of the IRFs are significant, suggesting an unconventional impact with the inflation rate showing a negative slope in response to oil price shocks. When the impulse is the real crude oil price and the response is the interest rate, the IRF is significant in most periods, indicating that a one standard deviation shock in the real crude oil price leads to a persistent and gradual increase in the repo rate by over 100% over time. Suppose the impulse is the inflation rate and the response is the interest rate. In that case, the IRF is significant in the early periods, with a one standard deviation shock in the inflation rate resulting in a persistent increase in the repo rate by up to 42.36% in the fourth month. Variance decomposition reveals that the inflation rate has a greater impact than the real crude oil price on the variability of the repo rate, accounting for up to 60.32% in the third month.

FIGURE 10
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, SAUDI ARABIA, SB OF 2008 *M7*

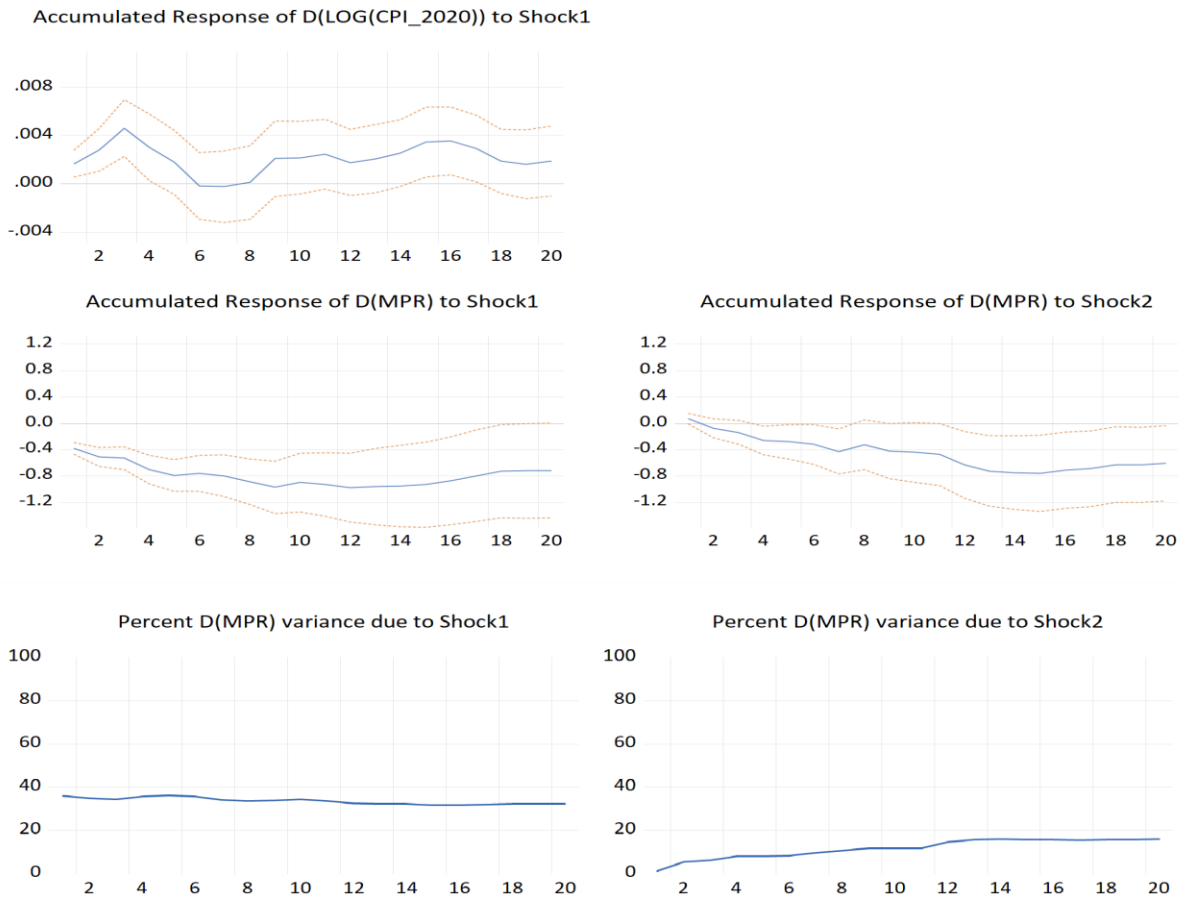


Note: RP is the Repo Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

As shown in Figure 11, the IRF for Nigeria indicates the following: When the impulse is the real crude oil price and the response is the inflation rate, the IRF is significant in the early periods, suggesting a one standard deviation shock in the real crude oil price will swiftly increase the monetary policy rate by up to 0.46%. Conversely, when the impulse is the real crude oil price and the response is the interest rate, none of the IRFs are significant, indicating an unconventional impact, with the rate showing a negative slope and a persistent reduction of up to 97.36% in the twelfth month. Similarly, suppose the impulse is the inflation

rate and the response is the interest rate. In that case, the IRFs are not significant, with the rate also showing a negative slope and a significant reduction of up to 75.56% over time. Variance decomposition reveals that the real crude oil price has a greater effect than the inflation rate on the variability of the monetary policy rate, particularly in the first month, where it accounts for up to 36.02% of the variability.

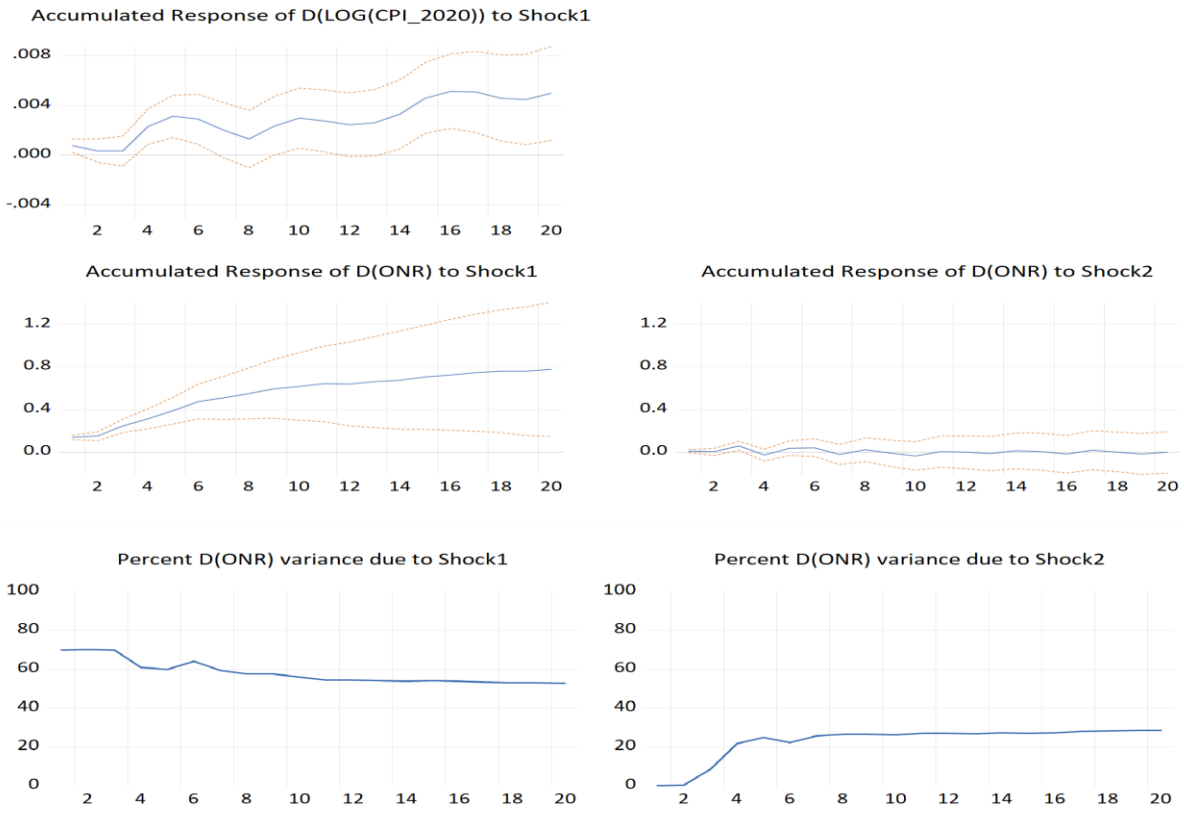
FIGURE 11
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, NIGERIA, SB OF 2008$_{M8}$



Note: MPR is the Monetary Policy Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

As shown in Figure 12, the IRF for Canada reveals the following: When the impulse is the real crude oil price and the response is the inflation rate, the IRF is significant in the later periods, indicating that a one standard deviation shock in the real crude oil price will gradually increase the inflation rate by up to 0.52%. Conversely, when the impulse is the real crude oil price and the response is the interest rate, the IRFs are significant, showing that a one standard deviation shock in the real crude oil price will lead to a substantial and persistent increase in the overnight rate, up to 77.72%. Suppose the impulse is the inflation rate and the response is the interest rate. In that case, none of the IRFs are significant, suggesting an unconventional impact with minimal change in the overnight rate. Variance decomposition indicates that the real crude oil price has a stronger effect than the inflation rate on the variability of the overnight rate, particularly in the second month, where it accounts for up to 70.07%.

FIGURE 12
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, CANADA, SB OF 2008*M8*

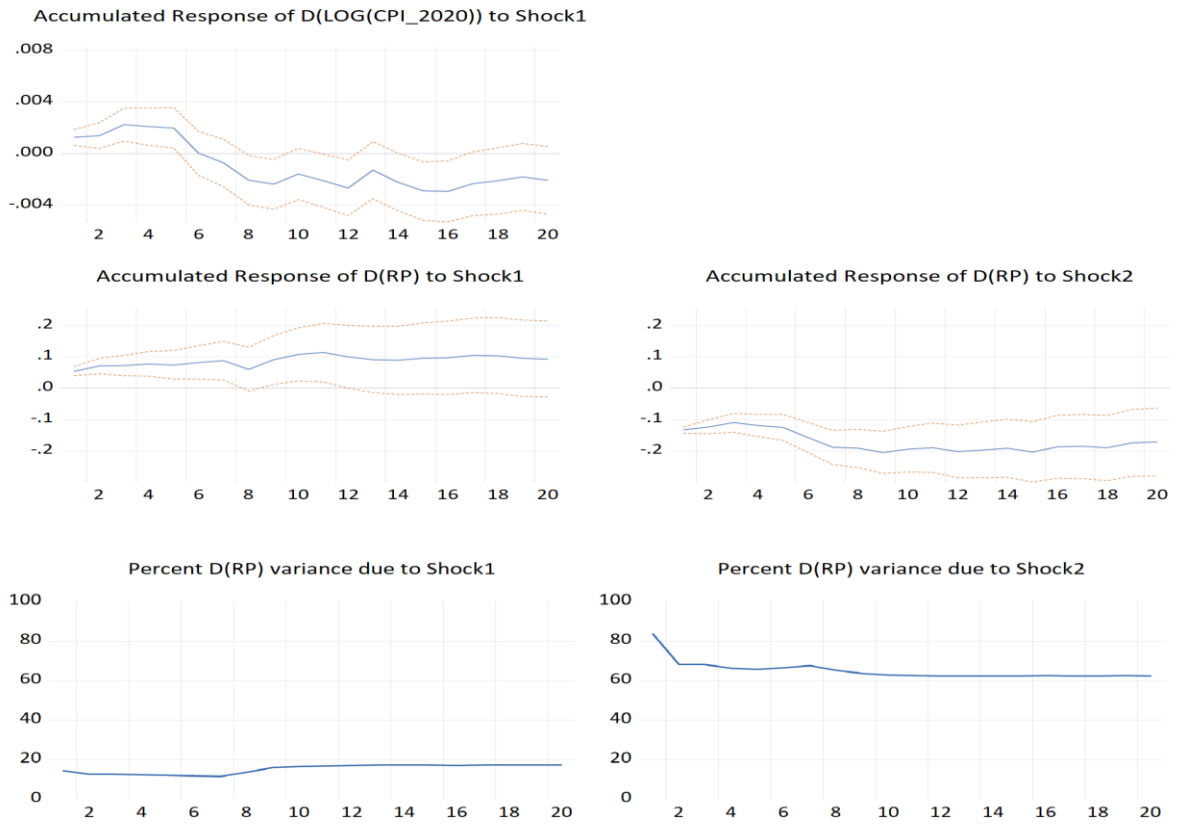


Note: ONR is the Overnight Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

Structural Break of August 2014

As presented in Figure 13, the IRF for Saudi Arabia during the 2014 structural break indicates the following: When the impulse is the real crude oil price and the response is the inflation rate, the IRF is significant primarily in the early periods, showing a slight increase in the inflation rate by up to 0.23%. The impact becomes unconventional in later periods, with the inflation rate exhibiting a negative slope. When the impulse is the real crude oil price and the response is the interest rate, the IRF is significant in most periods, reflecting a persistent and gradual increase in the repo rate by more than 11.40%. Suppose the impulse is the inflation rate and the response is the interest rate. In that case, none of the IRFs are significant, indicating an unconventional impact with minimal change in the repo rate. Variance decomposition reveals that the inflation rate has a stronger effect than the real crude oil price on the variability of the repo rate, particularly in the first month, where it accounts for up to 83.61% of the variability.

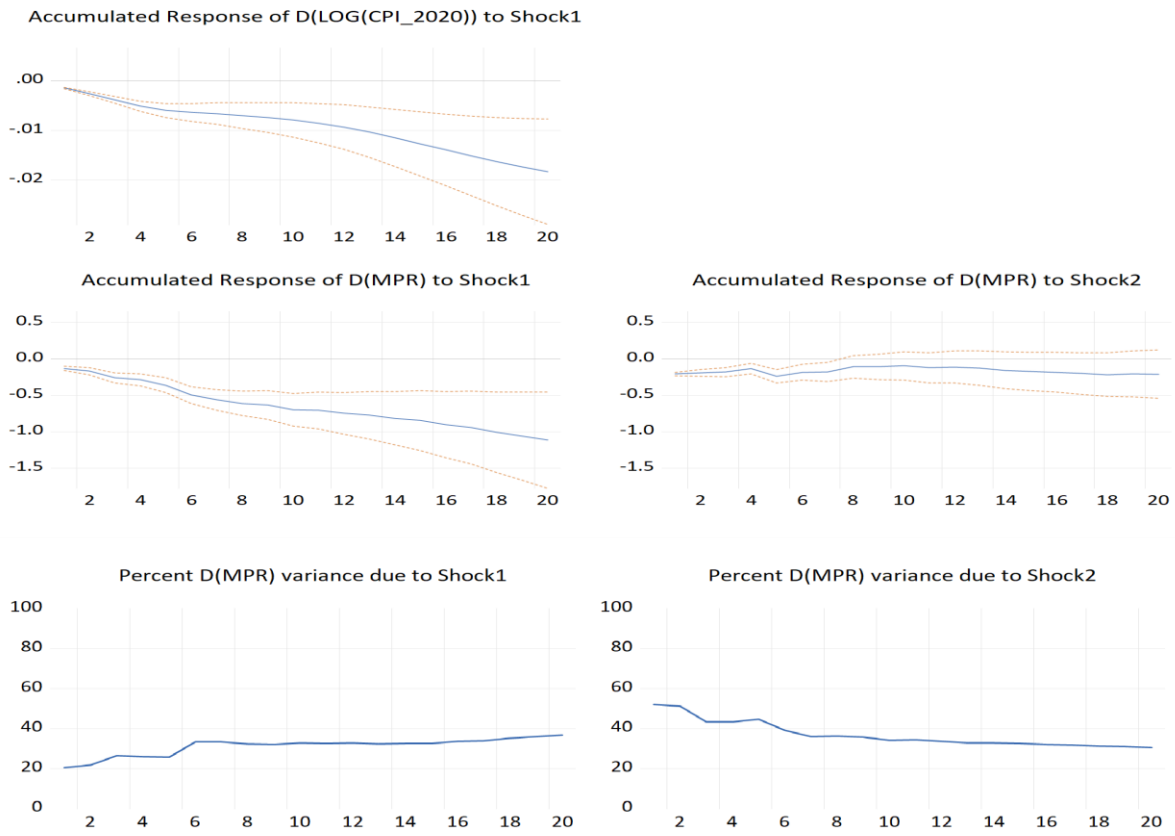
FIGURE 13
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, SAUDI ARABIA, SB OF 2014*M8*



Note: RP is the Repo Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

As presented in Figure 14, the IRF findings for Nigeria are as follows: When the impulse is the real crude oil price and the response is the inflation rate, none of the IRFs are significant, suggesting an unconventional impact with the inflation rate exhibiting a negative slope. Similarly, when the impulse is the real crude oil price and the response is the interest rate, none of the IRFs are significant, indicating an unconventional effect on the monetary policy rate, which also shows a negative slope. Notably, a one standard deviation shock to the real crude oil price results in a persistent and significant reduction in the monetary policy rate by more than 100% over time. When the impulse is the inflation rate and the response is the interest rate, none of the IRFs are significant, reflecting an unconventional impact with a negative slope. Variance decomposition analysis shows that the inflation rate explains a greater proportion of the variability in the monetary policy rate compared to the real crude oil price, accounting for up to 51.93% of the variability in the first month.

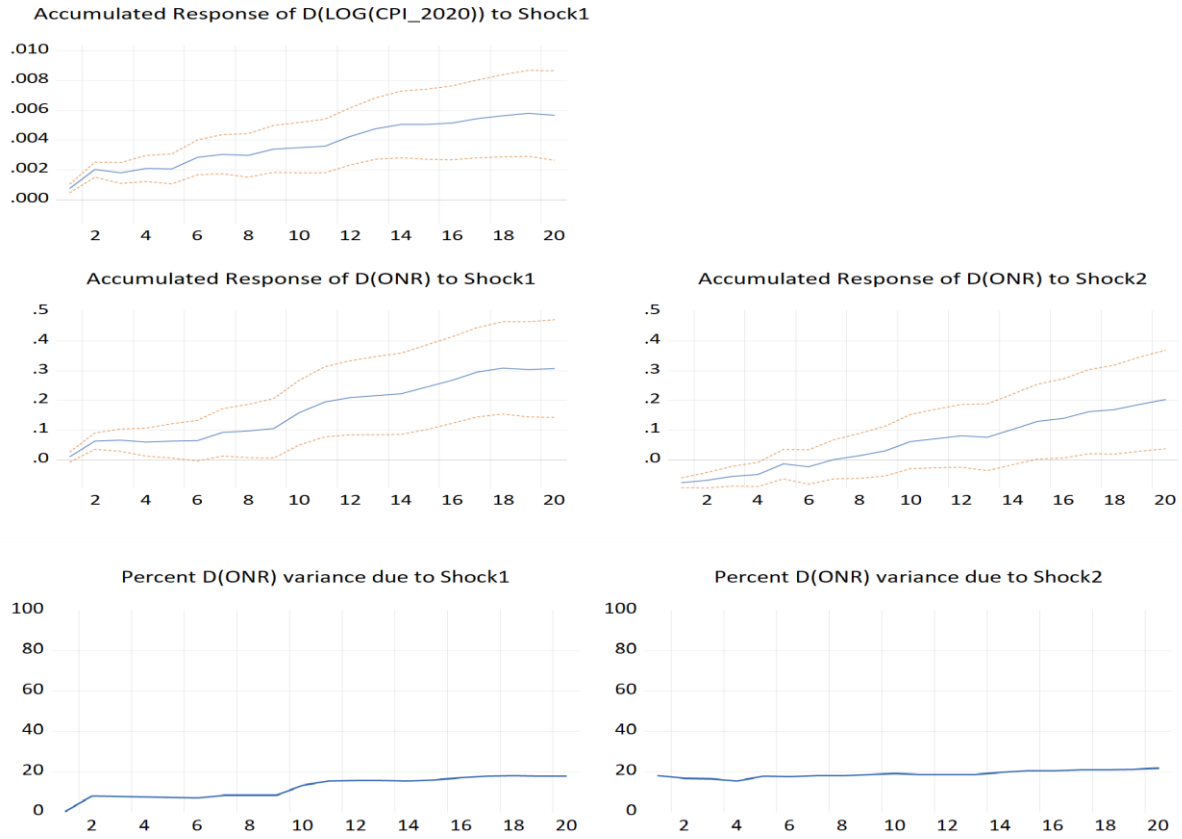
FIGURE 14
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, NIGERIA, SB OF 2014*M7*



Note: MPR is the Monetary Policy Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

As presented in Figure 15, the IRFs for Canada reveal the following dynamics: When the impulse is the real crude oil price and the response is the inflation rate, all IRFs are statistically significant, indicating that a one standard deviation shock to the real crude oil price results in a persistent but gradual increase in the inflation rate, reaching up to 0.58% over time. Conversely, when the impulse is the real crude oil price and the response is the interest rate, the IRFs are significant in most periods. Specifically, a one standard deviation shock to the real crude oil price leads to a substantial and persistent increase in the overnight rate, reaching up to 30.97% over time. When the impulse is the inflation rate and the response is the interest rate, the IRFs are significant in the later periods, suggesting that a one standard deviation shock to the inflation rate results in a persistent and notable increase in the overnight rate, peaking at 20.37%. Variance decomposition analysis indicates that the inflation rate has a greater influence than the real crude oil price in explaining the variability of the overnight rate, accounting for up to 21.62% of the variability over time.

FIGURE 15
IMPULSE RESPONSE FUNCTION AND VARIANCE DECOMPOSITION, CANADA, SB OF 2014*M8*



Note: ONR is the Overnight Rate.
**If the lower or upper bound of the IRFs intersects with or falls below the zero line, the IRF is considered statistically insignificant.*

In response to real crude oil price shocks, Saudi Arabia shows unconventional patterns in both 2008 and 2014, with inflation rates exhibiting a negative slope. Despite this, there is a slight increase in inflation, consistent with expectations. The impact on the repo rate is more pronounced in 2008, suggesting a more aggressive contractionary policy by the Saudi Central Bank (SCB). The repo rate's response to inflation shocks is also unconventional, with a negative slope. Variance decomposition reveals that inflation rate shocks primarily explain the variability in the repo rate in both 2008 and 2014. Nigeria shows a noticeable increase in inflation in response to real crude oil price shocks during 2008, but not in 2014. This supports the expectation that oil price shocks raise inflation. The impact on the monetary policy rate is insignificant in both years, indicating a puzzling expansionary policy by the Central Bank of Nigeria (CBN) in response to these shocks. It is evident that the CBN responded to an inflation rate shock by implementing an expansionary monetary policy, specifically by lowering the monetary policy rate. Variance decomposition shows that real crude oil price shocks account for more variability in the monetary policy rate than inflation rate shocks. Canada exhibits significant responses to real crude oil price shocks in 2008 and 2014, leading to a slight but persistent increase in inflation. This supports the expectation of rising inflation from higher crude oil prices. The impact on the overnight rate is more substantial in 2014 than 2008 and 1990, reflecting a more aggressive contractionary policy by the Bank of Canada (BOC). The response to inflation shocks shows a significant increase in 2014, aligning with expectations of the BOC raising rates to combat

inflation. Variance decomposition indicates that the variability of the overnight rate is influenced by both crude oil price and inflation rate shocks, depending on the structural break.

POLICY DISCUSSION AND CONCLUDING REMARKS

Revisiting the impacts observed in this study across various countries reveals distinct monetary policy responses to structural breaks: mainly in structural break of 2008, both U.S.A. and China implemented aggressive contractionary monetary policies. U.S.A. raised the federal funds rate, while China adjusted the reserve requirement ratio. Conversely, Japan's response involved a modest increase in the policy rate to address rising real crude oil prices. Saudi Arabia adopted a significant increase in the repo rate to counteract the effects of the oil shock. Nigeria, however, exhibited an atypical response by implementing an expansionary monetary policy, while Canada applied a relatively moderate tightening of monetary policy.

The diverse monetary policies adopted in response to oil shocks reveal broader implications for economic coordination. Most major oil-driven economies, whether oil-importing or -exporting, have pursued contractionary policies to combat inflation induced by rising oil prices. U.S.A. and China significantly raised policy rates, while Japan, Canada, and Saudi Arabia also tightened monetary policy. In contrast, Nigeria's expansionary stance deviates from this norm, reflecting a unique approach to managing oil shocks. Coordination challenges arise when individual countries prioritize their own welfare without considering global impacts, potentially leading to conflicts and inefficiencies. High interest rates in response to oil shocks can exacerbate economic cycles, and divergent policies can cause instability. Meyer et al. (2002) and Fischer (1987) highlight the difficulties in coordinating policies due to externalities, differences in policy goals, and the lag effects of fiscal measures. Ostry and Ghosh (2013) and Oudiz and Sachs (1984) note that while coordination can improve outcomes, it remains fragile and complex, often resulting in suboptimal policies and economic imbalances. While the potential benefits of coordination are acknowledged, they appear modest relative to the challenges of implementing and maintaining effective coordinated policies. The game matrix presented in Table 1 illustrates the strategic choices available to each economy, highlighting the trade-offs between cooperation and deviation.

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APPENDIX

TABLE 1
MONETARY POLICY STRATEGY AND MACROECONOMIC IMPACT

		Oil-exporting countries	
		Loosening	Tightening
Oil-importing countries	Loosening	Both GDPs Overheat	$\text{GDP}_{oil-imp} \uparrow$ vs. $\text{GDP}_{oil-exp} \downarrow$
	Tightening	$\text{GDP}_{oil-imp} \downarrow$ vs. $\text{GDP}_{oil-exp} \uparrow$	Both GDPs Contract

TABLE 2
STRUCTURAL VECTOR AUTOREGRESSION, U.S.A., SB OF 1990M9

Sample: 1990M09 1999M12
Included observations: 112
Estimation method: Maximum likelihood Structural VAR is just-identified

B =				
C(1)	0	0		
C(2)	C(4)	0		
C(3)	C(5)	C(6)		
	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.081771	0.005464	14.96663	0.0000
C(2)	0.001403	0.000187	7.490697	0.0000
C(3)	0.140339	0.046715	3.004171	0.0027
C(4)	0.001716	0.000115	14.96663	0.0000
C(5)	−0.323256	0.040347	−8.011961	0.0000
C(6)	0.360656	0.024097	14.96663	0.0000
Log likelihood	820.4605			
Estimated S matrix:				
0.061575	0.018904	−0.009353		
7.73*E* −05	0.000960	0.000409		
0.056620	−0.050420	0.122732		
Estimated B matrix:				
0.081771	0.000000	0.000000		
0.001403	0.001716	0.000000		
0.140339	−0.323256	0.360656		

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 3
IMPULSE RESPONSE FUNCTION, U.S.A., SB OF 1990$_{M9}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	6.16%	1.89%	−0.94%
2	7.57%	1.64%	0.40%
3	8.26%	1.40%	2.36%
4	8.15%	2.66%	3.04%
5	8.65%	1.80%	3.28%
6	7.81%	1.11%	2.10%
7	7.62%	0.99%	1.10%
8	7.68%	1.01%	0.62%
9	8.34%	2.09%	0.05%
10	8.21%	2.98%	−0.55%
11	8.57%	1.93%	−1.20%
12	8.83%	1.97%	−1.80%
13	9.87%	2.16%	−1.01%
14	9.79%	1.82%	−1.09%
15	9.81%	1.72%	−0.97%
16	9.50%	1.56%	−0.93%
17	9.24%	0.93%	−0.57%
18	8.64%	1.34%	−1.18%
19	8.14%	1.36%	−1.52%
20	7.93%	1.32%	−1.76%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	0.01%	0.10%	0.04%
2	0.05%	0.11%	0.01%
3	0.07%	0.09%	0.01%
4	0.08%	0.11%	0.03%
5	0.09%	0.12%	0.05%
6	0.10%	0.11%	0.05%
7	0.09%	0.12%	0.05%
8	0.09%	0.11%	0.06%
9	0.11%	0.11%	0.06%
10	0.11%	0.14%	0.05%
11	0.11%	0.15%	0.03%
12	0.11%	0.15%	0.03%
13	0.13%	0.15%	0.01%
14	0.14%	0.15%	0.01%
15	0.14%	0.16%	0.03%
16	0.15%	0.16%	0.01%
17	0.15%	0.16%	0.02%
18	0.15%	0.16%	0.02%
19	0.15%	0.16%	0.01%
20	0.15%	0.16%	0.00%

Accumulated Response of Δ*FFR*:

Period	Shock1	Shock2	Shock3
1	5.66%	−5.04%	12.27%
2	6.72%	−6.55%	15.19%
3	7.07%	−7.48%	21.94%
4	7.03%	−7.57%	26.37%
5	7.23%	−11.04%	26.21%
6	6.69%	−11.85%	27.21%
7	4.96%	−13.99%	29.86%
8	6.66%	−14.28%	29.87%
9	9.01%	−15.51%	31.82%
10	9.01%	−15.79%	35.30%
11	13.03%	−16.33%	34.74%
12	14.69%	−17.81%	35.27%
13	16.09%	−18.66%	37.52%
14	16.45%	−19.05%	36.83%
15	17.14%	−21.11%	37.77%
16	16.96%	−22.08%	37.19%
17	17.12%	−22.08%	37.30%
18	17.42%	−22.89%	36.37%
19	17.43%	−22.68%	34.75%
20	17.96%	−22.26%	33.58%

TABLE 4
VARIANCE DECOMPOSITION, U.S.A., SB OF 1990$_{M9}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.065087	89.4994%	8.43563%	2.06492%
2	0.067975	86.3678%	7.87237%	5.75987%
3	0.071114	79.8554%	7.30109%	12.8435%
4	0.072554	76.7421%	10.0338%	13.2241%
5	0.073279	75.7043%	11.2288%	13.0669%
6	0.075009	73.5269%	11.5550%	14.9181%
7	0.075715	72.2247%	11.3667%	16.4086%
8	0.075868	71.9411%	11.3217%	16.7372%
9	0.077129	70.3374%	12.9294%	16.7333%
10	0.077881	69.0120%	13.9833%	17.0047%
11	0.078936	67.3854%	15.3783%	17.2362%
12	0.079209	67.0248%	15.2750%	17.7002%
13	0.080314	66.8899%	14.9103%	18.1998%
14	0.080394	66.7669%	15.0597%	18.1734%
15	0.080409	66.7430%	15.0682%	18.1888%
16	0.080485	66.7646%	15.0791%	18.1563%
17	0.080856	66.2563%	15.5534%	18.1903%
18	0.081418	65.8946%	15.5954%	18.5100%
19	0.081640	65.9082%	15.5113%	18.5805%
20	0.081704	65.8726%	15.4898%	18.6377%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.001047	0.54609%	84.1738%	15.2801%
2	0.001165	13.2582%	69.4178%	17.3240%
3	0.001203	15.9056%	67.7175%	16.3769%
4	0.001245	15.1451%	65.9437%	18.9112%
5	0.001258	15.2751%	65.0431%	19.6818%
6	0.001271	16.6256%	63.9238%	19.4505%
7	0.001280	17.3670%	63.1734%	19.4596%
8	0.001288	17.1781%	62.7350%	20.0869%
9	0.001297	18.0662%	62.0789%	19.8549%
10	0.001337	16.9980%	64.2255%	18.7765%
11	0.001354	16.6672%	63.5529%	19.7800%
12	0.001355	16.6902%	63.5332%	19.7766%
13	0.001397	18.3666%	59.7898%	21.8436%
14	0.001401	18.4788%	59.5520%	21.9692%
15	0.001408	18.2919%	59.1423%	22.5658%
16	0.001419	18.4227%	58.3584%	23.2189%
17	0.001423	18.4334%	58.1534%	23.4133%
18	0.001424	18.5325%	58.0761%	23.3914%
19	0.001433	18.3059%	57.5183%	24.1758%
20	0.001435	18.2786%	57.4102%	24.3111%

Variance Decomposition of Δ*FFR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.144261	15.4042%	12.2156%	72.3802%
2	0.148312	15.0797%	12.5847%	72.3356%
3	0.163272	12.4900%	10.7109%	76.7990%
4	0.169180	11.6335%	9.97884%	78.3876%
5	0.172712	11.1759%	13.6018%	75.2223%
6	0.173272	11.1999%	13.7330%	75.0671%
7	0.177441	11.6328%	14.5543%	73.8129%
8	0.178277	12.4326%	14.4450%	73.1224%
9	0.181288	13.7008%	14.4308%	71.8684%
10	0.184618	13.2111%	13.9368%	72.8521%
11	0.189083	17.0946%	13.3679%	69.5375%
12	0.190467	17.6099%	13.7841%	68.6059%
13	0.192494	17.7676%	13.6893%	68.5430%
14	0.192691	17.7680%	13.7012%	68.5308%
15	0.194144	17.6294%	14.6304%	67.7402%
16	0.194479	17.5773%	14.8288%	67.5939%
17	0.194488	17.5821%	14.8274%	67.5905%
18	0.194902	17.5310%	14.9364%	67.5327%
19	0.195580	17.4097%	14.8446%	67.7457%
20	0.196051	17.4000%	14.8192%	67.7808%

TABLE 5
STRUCTURAL VECTOR AUTOREGRESSION, U.S.A., SB OF 2008$_{M8}$

Sample: 2008M08 2012M01
Included observations: 42
Estimation method: Maximum likelihood Structural VAR is just-identified

B =		
C(1)	0	0
C(2)	C(4)	0
C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.130984	0.014292	9.165145	0.0000
C(2)	−0.001143	0.000264	−4.331542	0.0000
C(3)	0.277338	0.034647	8.004668	0.0000
C(4)	0.001507	0.000164	9.165153	0.0000
C(5)	0.055535	0.015749	3.526289	0.0004
C(6)	0.094208	0.010279	9.165150	0.0000

Log likelihood	314.7194	
Estimated S matrix:		
0.057907	−0.007729	−0.066894
−2.32*E* −05	0.001145	−0.001288
0.042234	0.043115	0.014393
Estimated B matrix:		
0.130984	0.000000	0.000000
−0.001143	0.001507	0.000000
0.277338	0.055535	0.094208

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 6
IMPULSE RESPONSE FUNCTION, U.S.A., SB OF 2008$_{M8}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	5.79%	−0.77%	−6.69%
2	7.86%	−0.60%	−3.35%
3	9.27%	3.77%	−3.47%
4	7.79%	0.69%	−2.87%
5	6.31%	2.16%	−2.54%
6	4.05%	0.52%	−2.31%
7	2.67%	−0.37%	0.50%
8	3.21%	0.45%	−1.19%

9	4.35%	−1.13%	−0.39%
10	7.30%	0.58%	−1.03%
11	8.70%	0.86%	1.08%
12	10.79%	0.56%	0.88%
13	11.15%	1.15%	0.56%
14	11.81%	0.32%	0.92%
15	12.13%	1.16%	0.31%
16	12.12%	1.42%	0.73%
17	11.53%	0.87%	−0.09%
18	10.87%	1.09%	0.20%
19	10.77%	0.46%	0.20%
20	11.17%	0.55%	−0.10%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	−0.00%	0.11%	−0.13%
2	0.06%	0.10%	−0.10%
3	0.05%	0.17%	−0.08%
4	−0.03%	0.12%	−0.09%
5	−0.16%	0.04%	−0.13%
6	−0.20%	0.05%	−0.16%
7	−0.21%	0.07%	−0.11%
8	−0.21%	0.14%	−0.10%
9	−0.28%	0.10%	−0.07%
10	−0.29%	0.09%	−0.03%
11	−0.26%	0.08%	−0.00%
12	−0.18%	0.09%	−0.01%
13	−0.11%	0.10%	−0.05%
14	−0.09%	0.12%	−0.04%
15	−0.09%	0.14%	−0.03%
16	−0.12%	0.17%	0.02%
17	−0.16%	0.16%	0.02%
18	−0.19%	0.14%	−0.00%
19	−0.18%	0.12%	−0.03%
20	−0.16%	0.12%	−0.05%

Accumulated Response of Δ*FFR*:

Period	Shock1	Shock2	Shock3
1	4.22%	4.31%	1.44%
2	9.40%	5.92%	2.94%
3	12.27%	6.51%	2.96%
4	12.06%	4.84%	2.27%
5	10.65%	2.52%	3.52%
6	11.15%	4.28%	3.77%
7	11.36%	6.16%	5.59%
8	10.96%	6.74%	6.41%
9	10.11%	6.64%	7.64%
10	11.19%	5.25%	9.22%
11	14.31%	4.99%	8.78%
12	18.59%	5.07%	7.84%
13	21.85%	5.58%	6.73%
14	23.25%	6.97%	6.97%
15	22.65%	7.82%	8.65%
16	20.92%	8.14%	10.31%
17	19.41%	7.29%	10.60%
18	19.28%	6.10%	9.82%
19	20.80%	5.42%	8.53%
20	23.06%	5.65%	7.86%

TABLE 7
VARIANCE DECOMPOSITION, U.S.A., SB OF 2008$_{M8}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.088813	42.5113%	0.75725%	56.7314%
2	0.097103	40.0839%	0.66427%	59.2518%
3	0.107416	34.4901%	17.0790%	48.4309%
4	0.112868	32.9537%	22.9042%	44.1420%
5	0.114830	33.5080%	23.7613%	42.7307%
6	0.118181	35.2707%	24.3489%	40.3804%
7	0.122566	34.0587%	23.1636%	42.7777%
8	0.124107	33.4076%	23.0314%	43.5610%
9	0.125872	33.2916%	23.9635%	42.7449%
10	0.130562	36.0464%	23.9862%	39.9674%
11	0.133022	35.8294%	23.1510%	41.0196%
12	0.134702	37.3482%	22.6279%	40.0239%
13	0.134923	37.2991%	22.7495%	39.9514%
14	0.135386	37.2777%	22.9730%	39.7493%
15	0.135820	37.0978%	23.2081%	39.6940%
16	0.135909	37.0492%	23.2145%	39.7363%
17	0.136394	36.9753%	23.2119%	39.8127%
18	0.136600	37.0952%	23.1676%	39.7373%
19	0.136748	37.0208%	23.3278%	39.6515%
20	0.136842	37.0558%	23.2998%	39.6444%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.001723	0.01809%	44.1545%	55.8274%
2	0.001871	11.3932%	38.4487%	50.1580%
3	0.002014	10.1703%	45.9906%	43.8391%
4	0.002204	19.8130%	43.3991%	36.7879%
5	0.002696	36.7814%	36.4626%	26.7560%
6	0.002740	37.8369%	35.3159%	26.8472%
7	0.002785	36.7029%	34.8484%	28.4487%
8	0.002887	34.1855%	38.9718%	26.8427%
9	0.003020	36.5380%	37.9463%	25.5157%
10	0.003043	36.2182%	37.4367%	26.3452%
11	0.003080	36.5200%	36.6340%	26.8460%
12	0.003191	40.6656%	34.2906%	25.0438%
13	0.003289	42.4059%	32.2951%	25.2990%
14	0.003300	42.4949%	32.3365%	25.1686%
15	0.003311	42.2159%	32.6620%	25.1220%
16	0.003381	41.5662%	32.2220%	26.2118%
17	0.003397	41.9793%	32.0532%	25.9675%
18	0.003425	42.3619%	31.8402%	25.7979%
19	0.003446	41.8826%	31.8304%	26.2870%
20	0.003458	41.9657%	31.6050%	26.4293%

Variance Decomposition of Δ*FFR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.062047	46.3322%	48.2865%	5.38135%
2	0.083715	63.6204%	30.2001%	6.17949%
3	0.088713	67.1627%	27.3339%	5.50341%
4	0.090560	64.5058%	29.6302%	5.86398%
5	0.095341	60.3815%	32.6141%	7.00436%
6	0.097097	58.4829%	34.7008%	6.81625%
7	0.100603	54.5198%	35.8245%	9.65566%
8	0.101175	54.0610%	35.7467%	10.1923%
9	0.102278	53.5952%	34.9886%	11.4162%

10	0.104992	51.9300%	34.9601%	13.1098%
11	0.109645	55.7066%	32.1129%	12.1806%
12	0.118071	61.1608%	27.6977%	11.1414%
13	0.123106	63.2855%	25.6504%	11.0640%
14	0.124698	62.9421%	26.2383%	10.8196%
15	0.126262	61.6171%	26.0485%	12.3344%
16	0.128559	61.2466%	25.1894%	13.5640%
17	0.129765	61.4802%	25.1570%	13.3627%
18	0.130545	60.7571%	25.6785%	13.5643%
19	0.132232	60.5415%	25.2983%	14.1603%
20	0.134344	61.4881%	24.5392%	13.9726%

TABLE 8
STRUCTURAL VECTOR AUTOREGRESSION, U.S.A., SB OF 2014$_{M8}$

Sample: 2014M08 2024M05
Included observations: 118
Estimation method: Maximum likelihood Structural VAR is just-identified

B =

C(1)	0	0
C(2)	C(4)	0
C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.092985	0.006053	15.36229	0.0000
C(2)	0.006832	0.000656	10.41411	0.0000
C(3)	0.313100	0.036067	8.681166	0.0000
C(4)	0.005239	0.000341	15.36229	0.0000
C(5)	0.168650	0.027657	6.098004	0.0000
C(6)	0.275746	0.017950	15.36229	0.0000

Log likelihood 763.6342

Estimated S matrix:

0.103043	−0.020059	0.034764
0.001348	0.001329	0.001150
0.010858	−0.058452	0.112695

Estimated B matrix:

0.092985	0.000000	0.000000
0.006832	0.005239	0.000000
0.313100	0.168650	0.275746

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 9
IMPULSE RESPONSE FUNCTION, U.S.A., SB OF 2014$_{M8}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	10.30%	−2.01%	3.48%
2	14.27%	−3.56%	5.48%
3	15.09%	0.01%	1.00%
4	13.98%	2.58%	−0.15%
5	11.74%	3.08%	0.23%
6	11.13%	2.67%	0.97%
7	12.36%	0.28%	1.50%
8	12.21%	1.68%	2.04%
9	11.87%	1.78%	2.91%
10	12.34%	1.65%	1.08%
11	12.78%	2.90%	1.74%
12	12.09%	3.16%	2.45%
13	10.66%	1.85%	1.91%
14	10.47%	0.70%	1.10%
15	10.20%	1.02%	0.89%
16	11.79%	2.14%	0.73%
17	12.28%	2.53%	0.02%
18	11.89%	2.52%	0.73%
19	11.57%	2.49%	0.36%
20	11.47%	2.52%	−0.16%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	0.13%	0.13%	0.12%
2	0.28%	0.15%	0.16%
3	0.36%	0.15%	0.13%
4	0.39%	0.22%	0.10%
5	0.40%	0.29%	0.09%
6	0.41%	0.35%	0.09%
7	0.43%	0.36%	0.10%
8	0.46%	0.39%	0.12%
9	0.50%	0.44%	0.15%
10	0.54%	0.44%	0.13%
11	0.57%	0.47%	0.15%
12	0.62%	0.51%	0.16%
13	0.66%	0.53%	0.15%
14	0.67%	0.54%	0.14%
15	0.67%	0.55%	0.12%
16	0.70%	0.58%	0.12%
17	0.74%	0.60%	0.11%
18	0.77%	0.61%	0.11%
19	0.79%	0.63%	0.11%
20	0.81%	0.65%	0.09%

Accumulated Response of Δ*FFR*:

Period	Shock1	Shock2	Shock3
1	1.09%	−5.85%	11.27%
2	2.22%	−11.36%	17.01%
3	4.20%	−10.52%	18.71%
4	4.98%	−12.02%	21.29%
5	3.32%	−14.23%	23.03%
6	5.12%	−13.92%	26.57%
7	5.49%	−14.24%	30.06%
8	5.53%	−13.35%	33.19%
9	5.37%	−11.11%	34.13%

10	7.19%	−9.61%	34.38%
11	10.60%	−6.61%	34.63%
12	12.16%	−2.32%	35.33%
13	12.57%	0.59%	35.52%
14	12.44%	2.67%	35.16%
15	13.53%	5.88%	34.49%
16	15.11%	8.24%	34.13%
17	17.77%	10.00%	33.75%
18	20.09%	12.23%	34.08%
19	22.17%	13.96%	34.44%
20	24.03%	15.56%	33.62%

TABLE 10
VARIANCE DECOMPOSITION, U.S.A., SB OF 2014$_{M8}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.110584	86.8269%	3.29023%	9.88287%
2	0.120184	84.3955%	4.45974%	11.1448%
3	0.133406	68.8695%	10.7985%	20.3320%
4	0.136793	66.1579%	13.7954%	20.0467%
5	0.138754	66.9010%	13.5391%	19.5599%
6	0.139145	66.7140%	13.5528%	19.7332%
7	0.141806	64.9866%	15.8754%	19.1380%
8	0.142605	64.2727%	16.6586%	19.0687%
9	0.142913	64.0501%	16.5914%	19.3585%
10	0.144156	63.0550%	16.3147%	20.6303%
11	0.144921	62.4820%	16.8965%	20.6214%
12	0.145278	62.3985%	16.8436%	20.7579%
13	0.146665	62.1783%	17.3195%	20.5022%
14	0.147348	61.6191%	17.7652%	20.6157%
15	0.147422	61.5917%	17.7933%	20.6149%
16	0.148708	61.6715%	18.0557%	20.2729%
17	0.149009	61.5329%	18.0513%	20.4158%
18	0.149231	61.4201%	17.9977%	20.5822%
19	0.149310	61.4003%	17.9791%	20.6206%
20	0.149407	61.3252%	17.9560%	20.7188%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.002215	37.0209%	36.0077%	26.9714%
2	0.002708	55.2639%	24.3698%	20.3662%
3	0.002819	57.8287%	22.5065%	19.6648%
4	0.002922	54.7002%	26.2065%	19.0933%
5	0.003018	51.4766%	30.2780%	18.2454%
6	0.003081	49.5705%	32.8777%	17.5518%
7	0.003089	49.7253%	32.7334%	17.5412%
8	0.003132	49.3465%	33.0741%	17.5795%
9	0.003209	48.4430%	34.0824%	17.4746%
10	0.003239	48.8390%	33.4776%	17.6834%
11	0.003275	48.6173%	33.6655%	17.7172%
12	0.003347	49.2913%	33.6290%	17.0797%
13	0.003376	49.8293%	33.3095%	16.8612%
14	0.003382	49.7016%	33.2747%	17.0237%
15	0.003390	49.4729%	33.2461%	17.2810%
16	0.003423	49.4503%	33.5828%	16.9669%
17	0.003452	49.9040%	33.3509%	16.7452%
18	0.003463	50.1759%	33.1653%	16.6588%
19	0.003479	50.0090%	33.4877%	16.5033%
20	0.003492	49.9316%	33.4325%	16.6359%

Variance Decomposition of Δ*FFR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.127415	0.72622%	21.0450%	78.2288%
2	0.150669	1.08806%	28.4483%	70.4637%
3	0.153136	2.71912%	27.8380%	69.4429%
4	0.156208	2.86151%	27.6785%	69.4600%
5	0.159579	3.81894%	28.4378%	67.7433%
6	0.164475	4.78550%	26.8075%	68.4070%
7	0.168214	4.62543%	25.6659%	69.7087%
8	0.171340	4.45865%	25.0088%	70.5326%
9	0.173054	4.37950%	26.1872%	69.4333%
10	0.174676	5.38504%	26.4435%	68.1715%
11	0.180489	8.60884%	27.5220%	63.8692%
12	0.186309	8.78121%	31.1353%	60.0834%
13	0.188624	8.61572%	32.7569%	58.6274%
14	0.189800	8.51463%	33.5470%	57.9384%
15	0.192937	8.56443%	35.2465%	56.1890%
16	0.195047	9.03570%	35.9494%	55.0149%
17	0.197670	10.6093%	35.7896%	53.6011%
18	0.200295	11.6655%	36.1014%	52.2331%
19	0.202155	12.5176%	36.1753%	51.3071%
20	0.203798	13.1477%	36.2088%	50.6435%

TABLE 11
STRUCTURAL VECTOR AUTOREGRESSION, CHINA, SB OF 2008_{M8}

Sample: 2008M08 2012M01
Included observations: 42
Estimation method: Maximum likelihood Structural VAR is just-identified

B =				
C(1)	0	0		
C(2)	C(4)	0		
C(3)	C(5)	C(6)		
	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.103297	0.011271	9.165149	0.0000
C(2)	0.005234	0.001276	4.100260	0.0000
C(3)	0.314250	0.085578	3.672079	0.0002
C(4)	0.007398	0.000807	9.165148	0.0000
C(5)	0.451516	0.061000	7.401873	0.0000
C(6)	0.233130	0.025437	9.165150	0.0000
Log likelihood	197.2020			
Estimated S matrix:				
0.081644	−0.018024	0.039138		
−4.93*E* −05	0.004703	0.002690		
−0.109374	−0.007706	0.267078		
Estimated B matrix:				
0.103297	0.000000	0.000000		
0.005234	0.007398	0.000000		
0.314250	0.451516	0.233130		

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.

C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 12
IMPULSE RESPONSE FUNCTION, CHINA, SB OF 2008$_{M8}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	8.16%	−1.80%	3.91%
2	8.47%	−1.12%	5.25%
3	12.20%	3.24%	7.59%
4	12.74%	4.75%	7.30%
5	15.15%	6.00%	4.82%
6	16.81%	7.14%	5.09%
7	16.51%	8.43%	0.71%
8	16.38%	8.76%	−2.19%
9	15.96%	6.59%	−3.55%
10	15.07%	3.83%	−4.27%
11	14.35%	1.76%	−4.60%
12	12.57%	−0.58%	−4.29%
13	11.59%	−2.95%	−3.13%
14	10.75%	−4.39%	−1.52%
15	9.89%	−4.46%	−0.39%
16	8.89%	−3.81%	0.38%
17	8.42%	−3.14%	0.67%
18	8.25%	−2.42%	0.81%
19	8.15%	−1.45%	0.55%
20	8.05%	−0.59%	0.11%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	−0.00%	0.47%	0.27%
2	0.03%	0.68%	0.36%
3	0.13%	0.82%	0.22%
4	0.28%	0.84%	0.25%
5	0.43%	0.85%	0.19%
6	0.47%	0.94%	0.01%
7	0.61%	1.01%	0.08%
8	0.61%	0.97%	0.11%
9	0.73%	1.00%	0.11%
10	0.73%	0.98%	0.09%
11	0.74%	0.93%	0.01%
12	0.75%	0.89%	−0.02%
13	0.75%	0.86%	−0.05%
14	0.70%	0.85%	−0.07%
15	0.66%	0.82%	−0.09%
16	0.61%	0.76%	−0.10%
17	0.58%	0.70%	−0.10%
18	0.54%	0.66%	−0.10%
19	0.50%	0.64%	−0.09%
20	0.47%	0.62%	−0.05%

Accumulated Response of Δ*RRR*:

Period	Shock1	Shock2	Shock3
1	−10.94%	−0.77%	26.71%
2	−9.24%	7.39%	39.62%
3	−5.22%	18.15%	41.01%
4	1.90%	28.29%	44.35%
5	7.62%	37.40%	47.82%
6	19.04%	50.20%	41.49%
7	24.39%	61.76%	38.15%
8	30.53%	67.52%	35.66%
9	36.47%	68.44%	30.81%
10	42.68%	67.67%	25.48%
11	44.37%	64.74%	23.50%
12	46.28%	60.87%	20.71%
13	47.26%	56.82%	20.34%
14	46.67%	53.26%	21.12%
15	44.63%	50.61%	21.42%
16	42.77%	48.29%	20.16%
17	40.08%	45.82%	19.55%
18	37.41%	43.90%	18.94%
19	34.51%	42.76%	18.12%
20	31.77%	41.66%	17.66%

TABLE 13
VARIANCE DECOMPOSITION, CHINA, SB OF 2008_{M8}

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.092316	78.2145%	3.81208%	17.9734%
2	0.093572	76.2344%	4.24688%	19.5187%
3	0.112225	64.0446%	18.0135%	17.9420%
4	0.113410	62.9380%	19.4268%	17.6352%
5	0.119243	61.0398%	18.6705%	20.2897%
6	0.120955	61.2004%	19.0295%	19.7701%
7	0.129315	53.5989%	17.6348%	28.7664%
8	0.132576	51.0032%	16.8422%	32.1546%
9	0.135099	49.2155%	18.8135%	31.9711%
10	0.138347	47.3397%	21.8992%	30.7611%
11	0.140126	46.4133%	23.5447%	30.0420%
12	0.143201	45.9840%	25.2020%	28.8140%
13	0.145941	44.7253%	26.9013%	28.3734%
14	0.147772	43.9455%	27.1917%	28.8628%
15	0.148454	43.8814%	26.9445%	29.1740%
16	0.149131	43.9294%	26.8903%	29.1803%
17	0.149387	43.8798%	27.0028%	29.1174%
18	0.149575	43.7809%	27.1663%	29.0528%
19	0.149913	43.5892%	27.4586%	28.9522%
20	0.150225	43.4117%	27.6719%	28.9164%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.005418	0.00828%	75.3506%	24.6411%
2	0.005890	0.44905%	76.2806%	23.2704%
3	0.006289	2.58850%	72.3065%	25.1050%
4	0.006483	8.12141%	68.1303%	23.7483%
5	0.006673	12.3975%	64.3190%	23.2835%
6	0.006949	11.7351%	60.7903%	27.4746%
7	0.007174	15.2242%	58.0404%	26.7353%
8	0.007189	15.1645%	58.0706%	26.7649%
9	0.007290	17.3778%	56.5883%	26.0339%

10	0.007295	17.3615%	56.5929%	26.0457%
11	0.007355	17.0987%	56.0022%	26.8991%
12	0.007374	17.0310%	56.1252%	26.8438%
13	0.007388	16.9728%	56.0231%	27.0041%
14	0.007408	17.3559%	55.7491%	26.8950%
15	0.007425	17.5168%	55.6296%	26.8536%
16	0.007468	17.6971%	55.7315%	26.5715%
17	0.007497	17.7124%	55.9202%	26.3673%
18	0.007523	17.9874%	55.8204%	26.1922%
19	0.007535	18.1389%	55.7440%	26.1170%
20	0.007552	18.2431%	55.5560%	26.2009%

Variance Decomposition of Δ*RRR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.288708	14.3518%	0.07124%	85.5769%
2	0.327074	11.4508%	6.27697%	82.2722%
3	0.346944	11.5241%	15.1980%	73.2778%
4	0.369929	13.8393%	20.8875%	65.2732%
5	0.386791	14.8437%	24.6489%	60.5073%
6	0.427855	19.2608%	29.0997%	51.6396%
7	0.447652	19.0226%	33.2499%	47.7275%
8	0.456176	20.1274%	33.6140%	46.2586%
9	0.462682	21.2161%	32.7149%	46.0690%
10	0.469909	22.3109%	31.7433%	45.9458%
11	0.471547	22.2853%	31.9101%	45.8047%
12	0.474331	22.1860%	32.1999%	45.6141%
13	0.476176	22.0573%	32.6754%	45.2673%
14	0.477604	21.9410%	33.0352%	45.0238%
15	0.478785	22.0139%	33.1803%	44.8058%
16	0.479871	22.0652%	33.2633%	44.6715%
17	0.481298	22.2468%	33.3298%	44.4234%
18	0.482457	22.4462%	33.3278%	44.2261%
19	0.483531	22.7056%	33.2355%	44.0589%
20	0.484454	22.9395%	33.1607%	43.8998%

TABLE 14
STRUCTURAL VECTOR AUTOREGRESSION, CHINA, SB OF 2014_{M8}

Sample (adjusted): 2014M08 2021M12 Included observations: 89 after adjustments Estimation method: Maximum likelihood Structural VAR is just-identified

B =

C(1)	0	0
C(2)	C(4)	0
C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.115144	0.008630	13.34166	0.0000
C(2)	−0.001343	0.000312	−4.302606	0.0000
C(3)	0.114284	0.033624	3.398886	0.0007
C(4)	0.002787	0.000209	13.34167	0.0000
C(5)	−0.231573	0.027494	−8.422609	0.0000
C(6)	0.201159	0.015077	13.34166	0.0000

Log likelihood	403.0814	
Estimated S matrix:		
0.085853	0.099764	0.007984
−0.003416	0.002185	0.002527
0.079861	−0.181554	0.169977
Estimated B matrix:		
0.115144	0.000000	0.000000
−0.001343	0.002787	0.000000
0.114284	−0.231573	0.201159

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 15
IMPULSE RESPONSE FUNCTION, CHINA, SB OF 2014$_{M8}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	8.59%	9.98%	0.80%
2	12.04%	10.88%	1.63%
3	15.82%	5.58%	−0.56%
4	14.68%	3.69%	−2.47%
5	11.49%	3.28%	−1.53%
6	12.19%	2.59%	−1.09%
7	13.96%	1.85%	−1.00%
8	15.39%	1.04%	1.06%
9	15.11%	0.40%	1.47%
10	13.85%	−0.03%	0.98%
11	12.22%	1.31%	0.77%
12	12.30%	1.44%	−2.33%
13	11.76%	0.72%	−3.79%
14	11.02%	0.26%	−2.72%
15	10.97%	−1.03%	−1.12%
16	11.11%	−1.24%	0.22%
17	10.39%	0.09%	0.72%
18	10.78%	1.06%	0.38%
19	11.51%	0.19%	−1.30%
20	10.69%	0.65%	−2.36%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	−0.34%	0.22%	0.25%
2	−0.28%	0.23%	0.29%
3	−0.26%	0.14%	0.26%
4	−0.12%	0.20%	0.18%
5	−0.15%	0.23%	0.06%
6	−0.14%	0.17%	0.06%
7	−0.14%	0.13%	0.07%
8	−0.05%	0.19%	0.12%

9	0.00%	0.14%	0.11%
10	0.02%	0.14%	0.07%
11	0.06%	0.21%	−0.03%
12	−0.04%	0.25%	−0.07%
13	−0.22%	0.41%	−0.02%
14	−0.25%	0.37%	0.03%
15	−0.23%	0.29%	0.05%
16	−0.19%	0.28%	0.03%
17	−0.20%	0.32%	−0.01%
18	−0.22%	0.30%	−0.01%
19	−0.19%	0.30%	−0.04%
20	−0.16%	0.31%	−0.04%

Accumulated Response of Δ*RRR*:

Period	Shock1	Shock2	Shock3
1	7.99%	−18.16%	17.00%
2	6.70%	−15.15%	18.05%
3	13.70%	−19.49%	14.27%
4	12.49%	−18.92%	15.37%
5	17.41%	−19.28%	19.36%
6	18.24%	−20.10%	17.64%
7	17.35%	−28.13%	21.01%
8	15.39%	−24.82%	23.40%
9	20.70%	−26.33%	23.64%
10	17.88%	−28.52%	24.26%
11	14.53%	−25.96%	27.86%
12	17.08%	−26.35%	24.78%
13	14.13%	−29.17%	23.32%
14	14.36%	−26.24%	21.90%
15	13.54%	−27.16%	22.33%
16	13.49%	−29.10%	22.16%
17	12.46%	−27.70%	21.11%
18	13.26%	−25.36%	22.07%
19	11.41%	−26.04%	22.07%
20	11.42%	−24.34%	19.40%

TABLE 16
VARIANCE DECOMPOSITION, CHINA, SB OF 2014$_{M8}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.131861	42.3913%	57.2421%	0.36662%
2	0.136873	45.7283%	53.5609%	0.71078%
3	0.153120	42.6125%	54.7697%	2.61779%
4	0.155867	41.6568%	54.3237%	4.01956%
5	0.159417	43.8194%	51.9972%	4.18339%
6	0.159783	43.8116%	51.9461%	4.24221%
7	0.160934	44.3968%	51.4182%	4.18494%
8	0.163067	44.0054%	50.3298%	5.66478%
9	0.163267	43.9274%	50.3570%	5.71560%
10	0.163878	44.1833%	50.0516%	5.76510%
11	0.165251	44.4346%	49.8796%	5.68585%
12	0.168131	42.9278%	48.1911%	8.88113%
13	0.169002	42.5870%	47.8745%	9.53858%
14	0.169569	42.4958%	47.6293%	9.87486%
15	0.170805	41.8841%	47.5114%	10.6045%

16	0.171350	41.6246%	47.2243%	11.1511%
17	0.172084	41.4432%	47.4169%	11.1399%
18	0.172433	41.3268%	47.5410%	11.1322%
19	0.173621	40.9395%	47.1404%	11.9201%
20	0.174194	40.8887%	46.9003%	12.2109%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.004778	51.1153%	20.9163%	27.9684%
2	0.004840	51.6161%	20.4130%	27.9710%
3	0.004934	49.7562%	22.9849%	27.2589%
4	0.005239	51.5228%	21.8851%	26.5921%
5	0.005408	48.7774%	20.7713%	30.4513%
6	0.005436	48.3616%	21.5050%	30.1334%
7	0.005456	48.0154%	21.9580%	30.0266%
8	0.005579	48.3664%	22.0695%	29.5641%
9	0.005631	48.4774%	22.4467%	29.0759%
10	0.005654	48.2372%	22.2606%	29.5022%
11	0.005791	46.2747%	22.7514%	30.9739%
12	0.005901	47.4680%	22.3814%	30.1506%
13	0.006386	48.4654%	25.2013%	26.3333%
14	0.006423	48.1238%	25.2366%	26.6397%
15	0.006481	47.3806%	26.3674%	26.2520%
16	0.006497	47.4981%	26.2490%	26.2529%
17	0.006519	47.1947%	26.3220%	26.4833%
18	0.006522	47.1980%	26.3382%	26.4637%
19	0.006535	47.1497%	26.2344%	26.6159%
20	0.006547	47.3130%	26.1653%	26.5217%

Variance Decomposition of Δ*RRR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.261212	9.34716%	48.3087%	42.3442%
2	0.263456	9.42796%	48.7869%	41.7852%
3	0.278600	14.7439%	46.0492%	39.2069%
4	0.279135	14.8738%	45.9144%	39.2119%
5	0.286253	17.0953%	43.6745%	39.2301%
6	0.287005	17.0893%	43.5284%	39.3823%
7	0.300048	15.7236%	46.9836%	37.2928%
8	0.303448	15.7908%	47.1255%	37.0837%
9	0.308434	18.2448%	45.8552%	35.9000%
10	0.310548	18.8201%	45.7274%	35.4525%
11	0.315457	19.3675%	44.9714%	35.6611%
12	0.318002	19.7032%	44.2695%	36.0273%
13	0.320943	20.1877%	44.2341%	35.5782%
14	0.322595	19.9866%	44.6065%	35.4069%
15	0.322860	20.0190%	44.6147%	35.3664%
16	0.323447	19.9467%	44.8121%	35.2413%
17	0.324088	19.9706%	44.8222%	35.2072%
18	0.325171	19.8985%	45.0403%	35.0612%
19	0.325766	20.1475%	44.9193%	34.9333%
20	0.327301	19.9589%	44.7689%	35.2722%

TABLE 17
STRUCTURAL VECTOR AUTOREGRESSION, JAPAN, SB OF 2008$_{M8}$

Sample (adjusted): 2008M08 2012M01 Included observations: 42 after adjustments Estimation method: Maximum likelihood Structural VAR is just-identified

B =

C(1)	0	0
C(2)	C(4)	0
C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.112242	0.012247	9.165146	0.0000
C(2)	0.000298	0.000430	0.692858	0.4884
C(3)	0.022891	0.003826	5.983166	0.0000
C(4)	0.002781	0.000303	9.165148	0.0000
C(5)	0.016735	0.002251	7.435633	0.0000
C(6)	0.008528	0.000930	9.165153	0.0000

Log likelihood 334.5255

Estimated S matrix:

0.055028	0.061670	−0.022328
−0.002040	0.001623	−0.000145
0.015224	0.009963	0.018475

Estimated B matrix:

0.112242	0.000000	0.000000
0.000298	0.002781	0.000000
0.022891	0.016735	0.008528

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 18
IMPULSE RESPONSE FUNCTION, JAPAN, SB OF 2008$_{M8}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	5.50%	6.17%	−2.23%
2	3.84%	5.72%	−4.58%
3	7.66%	5.63%	−3.37%
4	10.17%	5.38%	−4.54%
5	16.41%	3.68%	−0.21%
6	18.44%	2.62%	0.81%
7	16.84%	0.40%	2.05%
8	16.90%	−0.27%	3.80%

9	15.07%	−0.68%	2.59%
10	13.40%	−1.14%	2.56%
11	10.65%	−1.23%	0.64%
12	9.13%	−0.99%	0.06%
13	9.18%	0.03%	−0.11%
14	9.16%	0.61%	−1.27%
15	9.65%	0.62%	−1.13%
16	10.38%	0.42%	−1.15%
17	11.34%	0.36%	−0.46%
18	12.13%	0.45%	0.17%
19	12.18%	0.24%	0.18%
20	12.04%	−0.03%	0.48%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	−0.20%	0.16%	−0.01%
2	−0.20%	0.22%	−0.06%
3	−0.16%	0.28%	−0.07%
4	−0.07%	0.28%	−0.14%
5	−0.03%	0.22%	−0.10%
6	0.01%	0.25%	−0.01%
7	0.05%	0.29%	0.01%
8	0.07%	0.32%	0.04%
9	0.06%	0.28%	−0.02%
10	0.04%	0.23%	−0.01%
11	0.05%	0.24%	0.02%
12	0.03%	0.27%	0.02%
13	0.02%	0.29%	0.02%
14	−0.00%	0.29%	−0.02%
15	0.00%	0.27%	−0.02%
16	0.03%	0.27%	−0.01%
17	0.03%	0.28%	−0.00%
18	0.03%	0.29%	0.01%
19	0.03%	0.29%	−0.00%
20	0.03%	0.28%	−0.00%

Accumulated Response of Δ*PR*:

Period	Shock1	Shock2	Shock3
1	1.52%	1.00%	1.85%
2	0.28%	1.97%	0.51%
3	0.78%	2.27%	−0.35%
4	1.10%	1.75%	0.04%
5	1.98%	1.69%	0.18%
6	2.40%	2.08%	0.56%
7	2.83%	2.07%	1.00%
8	2.88%	1.92%	1.01%
9	2.76%	1.66%	1.03%
10	2.95%	1.42%	1.03%
11	2.62%	1.37%	1.18%
12	2.34%	1.51%	1.18%
13	2.04%	1.68%	0.92%
14	2.03%	1.71%	0.81%
15	2.05%	1.63%	0.64%
16	2.04%	1.61%	0.66%
17	2.18%	1.70%	0.79%
18	2.26%	1.80%	0.84%
19	2.34%	1.81%	0.84%

20	2.36%	1.70%	0.79%

TABLE 19
VARIANCE DECOMPOSITION, JAPAN, SB OF 2008_{M8}

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.085614	41.3119%	51.8866%	6.80154%
2	0.090422	40.4102%	46.7615%	12.8283%
3	0.098907	48.6906%	39.0906%	12.2188%
4	0.102750	51.0941%	36.2816%	12.6243%
5	0.128875	55.8721%	24.7935%	19.3344%
6	0.131303	56.2275%	24.5438%	19.2287%
7	0.134678	54.8519%	26.0300%	19.1181%
8	0.135980	53.8085%	25.7750%	20.4166%
9	0.137792	54.1576%	25.1915%	20.6509%
10	0.138882	54.7615%	24.9098%	20.3286%
11	0.142877	55.4481%	23.5397%	21.0122%
12	0.143827	55.8405%	23.2574%	20.9021%
13	0.144197	55.5556%	23.6365%	20.8079%
14	0.144781	55.1088%	23.6078%	21.2834%
15	0.144871	55.1549%	23.5784%	21.2667%
16	0.145067	55.2566%	23.5338%	21.2096%
17	0.145553	55.3281%	23.3788%	21.2931%
18	0.145906	55.3509%	23.2695%	21.3797%
19	0.145921	55.3405%	23.2842%	21.3753%
20	0.145984	55.3025%	23.2999%	21.3977%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.002611	61.0512%	38.6391%	0.30967%
2	0.002719	56.3292%	40.2452%	3.42559%
3	0.002820	54.5809%	42.2233%	3.19576%
4	0.003032	54.6400%	36.5629%	8.79712%
5	0.003138	52.5818%	37.5766%	9.84163%
6	0.003302	48.9256%	34.7123%	16.3621%
7	0.003365	48.5637%	35.2075%	16.2288%
8	0.003389	48.2504%	35.3195%	16.4301%
9	0.003451	46.5248%	35.2019%	18.2733%
10	0.003504	45.7131%	36.4814%	17.8054%
11	0.003520	45.3763%	36.2059%	18.4178%
12	0.003537	45.0921%	36.6660%	18.2419%
13	0.003551	44.9520%	36.9520%	18.0960%
14	0.003588	44.3068%	36.2257%	19.4675%
15	0.003594	44.1618%	36.4338%	19.4043%
16	0.003605	44.3658%	36.2220%	19.4122%
17	0.003608	44.3037%	36.2484%	19.4479%
18	0.003614	44.1575%	36.3142%	19.5283%
19	0.003617	44.0841%	36.2536%	19.6623%
20	0.003619	44.0602%	36.3038%	19.6360%

Variance Decomposition of Δ*PR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.025929	34.4710%	14.7630%	50.7660%
2	0.033166	35.1706%	17.5899%	47.2395%
3	0.034767	34.1137%	16.7619%	49.1243%
4	0.035508	33.5103%	18.1881%	48.3016%
5	0.036622	37.3276%	17.1253%	45.5471%
6	0.037253	37.3129%	17.6338%	45.0533%
7	0.037756	37.6097%	17.1673%	45.2230%
8	0.037793	37.5594%	17.3062%	45.1344%
9	0.037902	37.4458%	17.6743%	44.8798%
10	0.038019	37.4574%	17.9384%	44.6042%
11	0.038194	37.8412%	17.7981%	44.3608%
12	0.038329	38.1393%	17.8116%	44.0491%
13	0.038575	38.2474%	17.7961%	43.9565%
14	0.038591	38.2162%	17.7858%	43.9979%
15	0.038639	38.1217%	17.7829%	44.0954%
16	0.038640	38.1198%	17.7841%	44.0961%
17	0.038697	38.1414%	17.7819%	44.0768%
18	0.038721	38.1384%	17.8230%	44.0387%
19	0.038730	38.1656%	17.8157%	44.0187%
20	0.038748	38.1325%	17.8729%	43.9946%

TABLE 20
STRUCTURAL VECTOR AUTOREGRESSION, JAPAN, SB OF 2014$_{M10}$

Sample (adjusted): 2014M10 2021M06 Included observations: 81 after adjustments Estimation method: Maximum likelihood Structural VAR is just-identified

B =

C(1)	0	0
C(2)	C(4)	0
C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.100598	0.007904	12.72792	0.0000
C(2)	0.000324	0.000152	2.134784	0.0328
C(3)	0.013024	0.002766	4.708826	0.0000
C(4)	0.001348	0.000106	12.72792	0.0000
C(5)	0.005176	0.002537	2.040186	0.0413
C(6)	0.022540	0.001771	12.72792	0.0000

Log likelihood 600.4397

Estimated S matrix:

0.122396	0.088809	−0.000377
−0.001020	0.001891	0.000441
0.004920	0.000348	0.025996

Estimated B matrix:

0.100598	0.000000	0.000000
0.000324	0.001348	0.000000

	0.013024	0.005176	0.022540

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 21
IMPULSE RESPONSE FUNCTION, JAPAN, SB OF 2014$_{M10}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	12.24%	8.88%	−0.04%
2	15.66%	11.62%	1.89%
3	12.25%	9.09%	0.91%
4	11.11%	4.32%	1.12%
5	10.11%	0.80%	−0.21%
6	10.89%	−0.32%	−0.73%
7	13.22%	0.72%	0.33%
8	13.92%	3.20%	0.29%
9	13.91%	2.40%	−0.02%
10	13.81%	1.32%	−0.78%
11	14.08%	1.44%	0.50%
12	13.85%	−0.25%	−1.57%
13	11.76%	−1.44%	−1.47%
14	11.61%	−1.22%	−0.14%
15	11.41%	−0.44%	0.20%
16	11.46%	−0.07%	0.10%
17	11.21%	−0.82%	−0.21%
18	9.94%	−2.13%	−0.38%
19	9.83%	−2.37%	−0.31%
20	9.70%	−1.48%	−0.19%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	−0.10%	0.19%	0.04%
2	−0.06%	0.22%	0.03%
3	−0.07%	0.22%	0.02%
4	−0.04%	0.17%	0.03%
5	−0.03%	0.13%	0.04%
6	−0.03%	0.13%	0.05%
7	−0.00%	0.13%	0.05%
8	0.00%	0.14%	0.03%
9	0.07%	0.19%	0.02%
10	0.05%	0.18%	−0.05%
11	0.05%	0.14%	−0.05%
12	0.00%	0.10%	−0.02%
13	0.04%	0.17%	−0.01%
14	0.07%	0.21%	0.02%
15	0.07%	0.21%	0.01%
16	0.05%	0.16%	0.01%
17	0.05%	0.12%	0.01%

18	0.04%	0.12%	−0.00%
19	0.06%	0.12%	0.01%
20	0.06%	0.14%	0.00%

Accumulated Response of Δ*PR*:

Period	Shock1	Shock2	Shock3
1	0.49%	0.03%	2.60%
2	0.70%	0.31%	2.54%
3	0.59%	0.85%	2.51%
4	0.76%	0.86%	2.65%
5	0.73%	0.74%	2.61%
6	0.89%	0.70%	2.51%
7	1.25%	0.83%	2.51%
8	1.01%	0.91%	2.42%
9	1.20%	0.77%	2.42%
10	0.99%	0.48%	2.33%
11	1.40%	0.49%	2.29%
12	1.11%	0.51%	2.26%
13	1.45%	0.81%	2.12%
14	1.58%	0.91%	2.29%
15	1.55%	0.94%	2.23%
16	1.60%	0.91%	2.29%
17	1.52%	0.70%	2.24%
18	1.40%	0.48%	2.19%
19	1.36%	0.29%	2.30%
20	1.49%	0.50%	2.29%

TABLE 22
VARIANCE DECOMPOSITION, JAPAN, SB OF 2014$_{M10}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.151221	65.5098%	34.4896%	0.00062%
2	0.158624	64.1974%	34.3291%	1.47349%
3	0.164496	63.9934%	34.2839%	1.72268%
4	0.171665	59.2020%	39.2011%	1.59687%
5	0.176028	56.6293%	41.2818%	2.08893%
6	0.176638	56.4354%	41.4023%	2.16234%
7	0.178784	56.7810%	40.7566%	2.46244%
8	0.180632	55.7778%	41.8095%	2.41265%
9	0.180837	55.6515%	41.9113%	2.43713%
10	0.181325	55.3562%	42.0444%	2.59941%
11	0.181797	55.0909%	41.8311%	3.07799%
12	0.183756	53.9377%	41.7848%	4.27747%
13	0.185328	54.2979%	41.4940%	4.20803%
14	0.185826	54.0134%	41.2856%	4.70099%
15	0.186030	53.9071%	41.3690%	4.72390%
16	0.186071	53.8843%	41.3906%	4.72519%
17	0.186260	53.7924%	41.4648%	4.74281%
18	0.187166	53.7352%	41.5594%	4.70540%
19	0.187186	53.7271%	41.5668%	4.70611%
20	0.187408	53.6047%	41.6966%	4.69869%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.002194	21.6021%	74.3520%	4.04597%
2	0.002251	23.8988%	72.0908%	4.01037%
3	0.002257	23.9469%	71.7235%	4.32966%
4	0.002326	24.6654%	71.2198%	4.11475%
5	0.002357	24.0244%	71.7384%	4.23718%
6	0.002360	23.9748%	71.6390%	4.38618%
7	0.002380	25.1674%	70.5069%	4.32564%
8	0.002392	24.9814%	69.7835%	5.23512%
9	0.002540	28.4592%	66.8079%	4.73290%
10	0.002640	26.8757%	61.9472%	11.1771%
11	0.002680	26.0790%	63.0686%	10.8525%
12	0.002763	27.1623%	61.6648%	11.1729%
13	0.002890	26.9092%	62.6931%	10.3977%
14	0.002944	27.0053%	62.2905%	10.7042%
15	0.002946	27.0632%	62.2014%	10.7354%
16	0.002987	26.6342%	62.9126%	10.4531%
17	0.003017	26.1140%	63.6400%	10.2460%
18	0.003020	26.0655%	63.5249%	10.4096%
19	0.003031	26.3532%	63.1180%	10.5288%
20	0.003036	26.3101%	63.1222%	10.5677%

Variance Decomposition of Δ*PR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.026460	3.45816%	0.01731%	96.5245%
2	0.026697	4.02238%	1.11600%	94.8616%
3	0.027260	4.03778%	4.96286%	90.9994%
4	0.027353	4.41621%	4.93000%	90.6538%
5	0.027382	4.41901%	5.10330%	90.4777%
6	0.027450	4.72927%	5.10357%	90.1672%
7	0.027711	6.29267%	5.23524%	88.4721%
8	0.027836	6.96024%	5.26047%	87.7793%
9	0.027935	7.39885%	5.44447%	87.1567%
10	0.028185	7.86773%	6.41483%	85.7174%
11	0.028497	9.85474%	6.27546%	83.8698%
12	0.028656	10.8346%	6.21138%	82.9540%
13	0.029050	11.9865%	7.08191%	80.9316%
14	0.029137	12.0869%	7.15842%	80.7546%
15	0.029145	12.0876%	7.16495%	80.7475%
16	0.029154	12.1066%	7.16723%	80.7262%
17	0.029245	12.1125%	7.63625%	80.2512%
18	0.029359	12.1675%	8.16939%	79.6632%
19	0.029444	12.1211%	8.53912%	79.3398%
20	0.029557	12.2451%	9.01913%	78.7357%

TABLE 23
STRUCTURAL VECTOR AUTOREGRESSION, SAUDI ARABIA, SB OF 2008$_{M7}$

Sample: 2008M07 2012M01
Included observations: 43
Estimation method: Maximum likelihood Structural VAR is just-identified

B =		
C(1)	0	0
C(2)	C(4)	0
C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.171661	0.018511	9.273602	0.0000
C(2)	−0.003185	0.000635	−5.012148	0.0000
C(3)	0.901124	0.101124	8.911099	0.0000
C(4)	0.003506	0.000378	9.273620	0.0000
C(5)	−0.081719	0.026574	−3.075115	0.0021
C(6)	0.164399	0.017728	9.273617	0.0000
Log likelihood	219.4690			

Estimated S matrix:		
0.025143	0.081482	−0.011640
−0.004837	0.000397	−0.001717
0.025456	0.169450	0.179699
Estimated B matrix:		
0.171661	0.000000	0.000000
−0.003185	0.003506	0.000000
0.901124	−0.081719	0.164399

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 24
IMPULSE RESPONSE FUNCTION, SAUDI ARABIA, SB OF 2008$_{M7}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	2.51%	8.15%	−1.16%
2	2.43%	11.60%	−1.79%
3	2.11%	16.66%	0.38%
4	2.80%	16.38%	−4.00%
5	6.13%	15.15%	−3.63%
6	7.13%	11.94%	−5.93%
7	5.83%	10.03%	−2.28%
8	10.05%	5.77%	−1.46%
9	12.08%	1.97%	0.61%

10	16.61%	1.40%	4.59%
11	18.76%	−1.00%	4.20%
12	20.99%	−1.68%	5.44%
13	23.70%	−1.84%	2.99%
14	24.40%	−1.92%	2.40%
15	21.74%	−0.05%	2.80%
16	22.80%	−0.38%	0.45%
17	22.46%	−0.58%	1.35%
18	22.87%	0.05%	−0.02%
19	21.82%	0.20%	0.98%
20	21.56%	0.71%	0.72%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	−0.48%	0.04%	−0.17%
2	−0.41%	0.21%	−0.03%
3	−0.37%	0.10%	0.01%
4	−0.51%	0.22%	−0.04%
5	−0.55%	0.34%	−0.09%
6	−0.51%	0.32%	−0.08%
7	−0.66%	0.41%	−0.11%
8	−0.68%	0.53%	−0.15%
9	−0.71%	0.53%	−0.07%
10	−0.74%	0.54%	−0.11%
11	−0.66%	0.45%	−0.12%
12	−0.64%	0.42%	−0.07%
13	−0.70%	0.45%	−0.08%
14	−0.65%	0.47%	−0.01%
15	−0.61%	0.43%	−0.00%
16	−0.55%	0.46%	0.03%
17	−0.50%	0.42%	−0.01%
18	−0.52%	0.42%	0.00%
19	−0.48%	0.44%	−0.02%
20	−0.47%	0.44%	−0.03%

Accumulated Response of Δ*RP*:

Period	Shock1	Shock2	Shock3
1	2.55%	16.95%	17.97%
2	5.70%	31.86%	13.01%
3	9.18%	41.43%	8.60%
4	22.88%	42.36%	8.34%
5	29.71%	35.31%	1.87%
6	24.76%	35.17%	0.48%
7	28.56%	34.50%	2.18%
8	39.13%	27.53%	11.29%
9	47.47%	19.82%	18.26%
10	63.53%	11.48%	22.99%
11	73.74%	6.11%	25.97%
12	82.10%	4.23%	23.02%
13	88.81%	3.06%	24.65%
14	92.50%	2.28%	25.25%
15	96.66%	0.62%	23.32%
16	101.30%	−2.93%	22.29%
17	104.24%	−5.65%	22.09%
18	106.57%	−6.59%	21.12%
19	106.83%	−6.88%	21.47%

20	109.07%	−5.30%	22.37%

TABLE 25
VARIANCE DECOMPOSITION, SAUDI ARABIA, SB OF 2008_{M7}

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.086064	8.53463%	89.6363%	1.82910%
2	0.092945	7.32655%	90.6463%	2.02719%
3	0.108077	5.50629%	88.9460%	5.54774%
4	0.116871	5.05801%	76.1214%	18.8206%
5	0.122191	12.0496%	70.6403%	17.3102%
6	0.128814	11.4511%	69.7967%	18.7522%
7	0.135838	11.2091%	64.7303%	24.0605%
8	0.148725	17.3896%	62.2343%	20.3760%
9	0.156215	17.4476%	62.3165%	20.2359%
10	0.167540	22.4765%	54.2909%	23.2326%
11	0.170660	23.2442%	54.3116%	22.4443%
12	0.172693	24.3687%	53.1942%	22.4371%
13	0.176531	25.6777%	50.9145%	23.4078%
14	0.176770	25.7660%	50.7792%	23.4549%
15	0.179784	27.0983%	50.1765%	22.7252%
16	0.181652	26.8831%	49.1827%	23.9342%
17	0.181914	26.8392%	49.0530%	24.1078%
18	0.182579	26.6944%	48.8158%	24.4898%
19	0.183163	26.8581%	48.5119%	24.6301%
20	0.183268	26.8470%	48.5318%	24.6212%

Variance Decomposition of Δlog(CPI2020):

Period	S.E.	Shock1	Shock2	Shock3
1	0.005148	88.2832%	0.59488%	11.1219%
2	0.005655	74.7913%	9.37970%	15.8290%
3	0.005781	72.0935%	12.4106%	15.4959%
4	0.006080	70.1637%	15.0831%	14.7532%
5	0.006217	67.5243%	17.8830%	14.5926%
6	0.006233	67.5802%	17.8927%	14.5271%
7	0.006509	67.9025%	18.5373%	13.5602%
8	0.006633	65.4629%	21.1531%	13.3840%
9	0.006682	64.6573%	20.8444%	14.4983%
10	0.006702	64.4984%	20.7382%	14.7634%
11	0.006820	63.6698%	22.0594%	14.2708%
12	0.006848	63.2046%	22.0000%	14.7954%
13	0.006874	63.3003%	21.9979%	14.7017%
14	0.006921	62.8625%	21.7865%	15.3510%
15	0.006947	62.8446%	21.8890%	15.2664%
16	0.006979	62.9193%	21.7786%	15.3021%
17	0.007010	62.7794%	21.8071%	15.4135%
18	0.007011	62.7832%	21.7974%	15.4194%
19	0.007028	62.7435%	21.7785%	15.4780%
20	0.007029	62.7423%	21.7824%	15.4753%

Variance Decomposition of Δ*RP*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.248300	1.05108%	46.5725%	52.3764%
2	0.295583	1.88214%	58.3429%	39.7749%
3	0.315702	2.86087%	60.3211%	36.8181%
4	0.344277	18.2380%	50.7964%	30.9656%
5	0.363820	19.8594%	49.2445%	30.8961%
6	0.367432	21.2827%	48.2825%	30.4348%
7	0.369845	22.0617%	47.6881%	30.2502%
8	0.401389	25.6571%	43.5029%	30.8399%
9	0.422937	26.9999%	42.5055%	30.4947%
10	0.462431	34.6453%	38.8033%	26.5514%
11	0.477541	37.0577%	37.6540%	25.2883%
12	0.486066	38.7278%	36.4937%	24.7785%
13	0.491087	39.8073%	35.8078%	24.3849%
14	0.492567	40.1284%	35.6184%	24.2532%
15	0.494978	40.4460%	35.3847%	24.1692%
16	0.498517	40.7399%	35.3905%	23.8696%
17	0.500126	40.8237%	35.4585%	23.7178%
18	0.500854	40.9218%	35.3911%	23.6871%
19	0.500881	40.9200%	35.3905%	23.6895%
20	0.501712	40.9851%	35.3720%	23.6429%

TABLE 26
STRUCTURAL VECTOR AUTOREGRESSION, SAUDI ARABIA, SB OF 2014$_{M8}$

Sample (adjusted): 2014M08 2022M02 Included observations: 91 after adjustments Estimation method: Maximum likelihood Structural VAR is just-identified

B =

C(1)	0	0
C(2)	C(4)	0
C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.146040	0.010825	13.49074	0.0000
C(2)	−0.002002	0.000507	−3.951327	0.0001
C(3)	0.085942	0.023095	3.721175	0.0002
C(4)	0.004621	0.000343	13.49074	0.0000
C(5)	−0.160708	0.018732	−8.579132	0.0000
C(6)	0.137908	0.010222	13.49074	0.0000

Log likelihood 466.2390

Estimated S matrix:

0.095824	0.016212	−0.018879
0.001270	0.000982	0.005776
0.054789	−0.132747	0.021283

Estimated B matrix:

0.146040	0.000000	0.000000
−0.002002	0.004621	0.000000

	0.085942	−0.160708	0.137908

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 27
IMPULSE RESPONSE FUNCTION, SAUDI ARABIA, SB OF 2014$_{M8}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	9.58%	1.62%	−1.89%
2	15.30%	−1.46%	−2.03%
3	18.76%	−6.56%	0.48%
4	16.50%	0.08%	2.06%
5	14.85%	3.13%	1.41%
6	14.04%	1.04%	1.74%
7	14.08%	−0.74%	1.50%
8	16.44%	−2.91%	1.40%
9	15.84%	−3.36%	1.92%
10	14.90%	−2.04%	2.05%
11	16.70%	−0.02%	1.04%
12	15.92%	0.60%	0.59%
13	13.87%	0.24%	0.22%
14	12.86%	−0.40%	−0.58%
15	13.11%	−0.32%	0.02%
16	13.93%	−0.80%	−0.13%
17	15.12%	−0.63%	−0.09%
18	15.80%	0.84%	0.23%
19	15.30%	0.44%	0.19%
20	14.48%	0.31%	0.13%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	0.13%	0.10%	0.58%
2	0.14%	0.12%	0.59%
3	0.23%	0.05%	0.52%
4	0.21%	0.01%	0.45%
5	0.20%	−0.08%	0.42%
6	0.00%	0.45%	0.32%
7	−0.07%	0.43%	0.11%
8	−0.21%	0.30%	0.14%
9	−0.24%	0.29%	0.06%
10	−0.16%	0.34%	0.04%
11	−0.21%	0.43%	0.02%
12	−0.26%	0.57%	0.01%
13	−0.13%	0.61%	−0.04%
14	−0.22%	0.59%	−0.03%
15	−0.29%	0.53%	−0.08%
16	−0.29%	0.54%	−0.12%
17	−0.23%	0.58%	−0.08%

18	−0.21%	0.57%	−0.09%
19	−0.18%	0.55%	−0.08%
20	−0.21%	0.59%	−0.06%

Accumulated Response of Δ*RP*:

Period	Shock1	Shock2	Shock3
1	5.48%	−13.27%	2.13%
2	7.14%	−12.25%	8.89%
3	7.33%	−10.93%	7.69%
4	7.80%	−11.83%	10.34%
5	7.50%	−12.45%	11.98%
6	8.24%	−15.66%	13.03%
7	8.87%	−18.85%	13.08%
8	6.10%	−19.17%	14.91%
9	9.10%	−20.42%	14.92%
10	10.85%	−19.39%	16.14%
11	11.40%	−18.95%	16.92%
12	10.03%	−20.13%	16.43%
13	9.22%	−19.65%	17.01%
14	8.92%	−19.07%	16.92%
15	9.55%	−20.29%	16.21%
16	9.75%	−18.59%	16.49%
17	10.55%	−18.48%	16.15%
18	10.43%	−19.01%	16.36%
19	9.64%	−17.40%	16.04%
20	9.34%	−17.13%	15.05%

TABLE 28
VARIANCE DECOMPOSITION, SAUDI ARABIA, SB OF 2014$_{M8}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.099003	93.6822%	2.68152%	3.63630%
2	0.118431	88.8142%	8.63092%	2.55487%
3	0.135861	73.9690%	20.6870%	5.34402%
4	0.153749	59.9312%	34.8366%	5.23220%
5	0.157744	58.0271%	36.8316%	5.14130%
6	0.159370	57.1064%	37.8130%	5.08063%
7	0.160380	56.3898%	38.5701%	5.04005%
8	0.163551	56.3046%	38.8449%	4.85050%
9	0.163805	56.2629%	38.7986%	4.93857%
10	0.164611	56.0391%	39.0646%	4.89635%
11	0.167117	55.5317%	39.3534%	5.11486%
12	0.167478	55.5120%	39.3214%	5.16667%
13	0.168799	56.1134%	38.7533%	5.13330%
14	0.169412	56.0674%	38.6148%	5.31784%
15	0.169538	56.0057%	38.5597%	5.43469%
16	0.169813	56.0588%	38.5163%	5.42483%
17	0.170239	56.2678%	38.3339%	5.39825%
18	0.171040	55.9024%	38.7142%	5.38342%
19	0.171162	55.9112%	38.7124%	5.37642%
20	0.171365	56.0076%	38.6274%	5.36493%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.005995	4.48974%	2.68316%	92.8271%
2	0.006003	4.52779%	2.83194%	92.6403%
3	0.006152	6.23334%	3.94691%	89.8198%
4	0.006201	6.20738%	4.32456%	89.4681%
5	0.006275	6.08092%	6.22630%	87.6928%
6	0.008483	8.75674%	41.8994%	49.3439%
7	0.008753	8.94039%	39.3872%	51.6724%
8	0.008960	10.8223%	39.7595%	49.4183%
9	0.009006	10.8276%	39.3601%	49.8123%
10	0.009052	11.4829%	39.1888%	49.3283%
11	0.009118	11.6293%	39.6964%	48.6743%
12	0.009235	11.6887%	40.8422%	47.4691%
13	0.009360	13.5048%	39.9771%	46.5180%
14	0.009408	14.3168%	39.6290%	46.0542%
15	0.009460	14.7196%	39.5281%	45.7523%
16	0.009469	14.6925%	39.4643%	45.8432%
17	0.009505	14.9860%	39.3515%	45.6625%
18	0.009509	15.0237%	39.3429%	45.6335%
19	0.009515	15.1144%	39.3117%	45.5739%
20	0.009529	15.1451%	39.3419%	45.5130%

Variance Decomposition of Δ*RP*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.145178	14.2426%	83.6082%	2.14914%
2	0.161345	12.5868%	68.0930%	19.3202%
3	0.162347	12.4461%	67.9235%	19.6304%
4	0.164800	12.1597%	66.2167%	21.6236%
5	0.165759	12.0530%	65.5934%	22.3537%
6	0.169325	11.7435%	66.4503%	21.8062%
7	0.172427	11.4578%	67.5125%	21.0297%
8	0.175613	13.5238%	65.1176%	21.3586%
9	0.178589	15.8873%	63.4601%	20.6526%
10	0.180150	16.5541%	62.6928%	20.7532%
11	0.180461	16.5925%	62.5365%	20.8709%
12	0.181433	16.9893%	62.2890%	20.7217%
13	0.181769	17.1264%	62.1281%	20.7456%
14	0.181888	17.1304%	62.1489%	20.7208%
15	0.182545	17.1264%	62.1509%	20.7226%
16	0.183370	16.9851%	62.4546%	20.5602%
17	0.183578	17.1347%	62.3173%	20.5480%
18	0.183670	17.1222%	62.3378%	20.5400%
19	0.184567	17.1372%	62.4923%	20.3705%
20	0.184875	17.1058%	62.3064%	20.5878%

TABLE 29
STRUCTURAL VECTOR AUTOREGRESSION, NIGERIA, SB OF 2008*M8*

Sample: 2008M08 2012M01
Included observations: 42
Estimation method: Maximum likelihood Structural VAR is just-identified

B =

C(1)	0	0
C(2)	C(4)	0
C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.067921	0.007411	9.165150	0.0000
C(2)	0.002249	0.000734	3.063992	0.0022
C(3)	−0.770523	0.149430	−5.156416	0.0000
C(4)	0.004484	0.000489	9.165150	0.0000
C(5)	−0.533079	0.108988	−4.891170	0.0000
C(6)	0.597332	0.065174	9.165150	0.0000

Log likelihood 158.5780

Estimated S matrix:

0.039649	0.023107	0.066040
0.001704	0.006867	−0.002287
−0.381501	0.070206	0.503633

Estimated B matrix:

0.067921	0.000000	0.000000
0.002249	0.004484	0.000000

−0.770523	−0.533079	0.597332

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 30
IMPULSE RESPONSE FUNCTION, NIGERIA, SB OF 2008$_{M8}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	3.96%	2.31%	6.60%
2	0.70%	2.22%	7.89%
3	0.86%	−1.12%	8.96%
4	−0.74%	−1.77%	9.35%
5	1.69%	−4.25%	6.78%
6	1.26%	−7.81%	6.89%
7	2.22%	−9.21%	3.67%
8	3.92%	−9.08%	2.96%
9	5.86%	−6.83%	−0.29%
10	8.11%	−4.75%	−2.09%
11	9.31%	−1.24%	−3.21%
12	10.94%	−0.31%	−4.14%
13	11.25%	1.61%	−2.48%
14	10.10%	1.21%	−2.15%
15	9.54%	2.14%	−1.83%
16	8.75%	2.26%	−2.40%
17	8.96%	2.64%	−2.78%
18	8.29%	2.43%	−2.39%
19	8.13%	1.85%	−1.79%
20	7.37%	1.63%	−0.44%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	0.17%	0.69%	−0.23%
2	0.28%	0.59%	−0.35%
3	0.46%	0.87%	−0.15%
4	0.30%	0.70%	0.18%
5	0.18%	0.48%	0.36%
6	−0.02%	0.34%	0.39%
7	−0.02%	0.40%	0.26%
8	0.01%	0.31%	−0.04%
9	0.21%	0.34%	−0.13%
10	0.22%	0.22%	−0.02%
11	0.25%	0.24%	0.06%
12	0.18%	0.26%	0.13%
13	0.21%	0.45%	0.01%
14	0.26%	0.56%	−0.11%
15	0.35%	0.61%	−0.18%
16	0.36%	0.49%	−0.08%
17	0.30%	0.42%	0.07%
18	0.19%	0.33%	0.12%

19	0.17%	0.42%	0.05%
20	0.19%	0.50%	−0.10%

Accumulated Response of Δ*MPR*:

Period	Shock1	Shock2	Shock3
1	−38.15%	7.02%	50.36%
2	−50.96%	−7.28%	34.74%
3	−52.87%	−13.72%	31.10%
4	−70.25%	−25.76%	46.73%
5	−79.31%	−27.80%	39.12%
6	−75.59%	−31.89%	47.55%
7	−79.59%	−42.47%	60.98%
8	−88.51%	−32.54%	74.20%
9	−96.96%	−42.15%	74.65%
10	−89.84%	−43.80%	71.60%
11	−92.62%	−47.18%	83.36%
12	−97.36%	−62.58%	81.18%
13	−96.00%	−72.28%	81.16%
14	−94.79%	−74.80%	82.84%
15	−92.89%	−75.76%	73.69%
16	−87.22%	−71.15%	64.54%
17	−79.46%	−68.66%	57.60%
18	−72.51%	−62.76%	57.18%
19	−72.10%	−62.95%	58.72%
20	−71.41%	−60.35%	58.20%

TABLE 31
VARIANCE DECOMPOSITION, NIGERIA, SB OF 2008$_{M8}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.080420	24.3077%	8.25610%	67.4362%
2	0.087750	34.2771%	6.94448%	58.7784%
3	0.094519	29.5722%	18.4732%	51.9547%
4	0.096162	31.3324%	18.3123%	50.3553%
5	0.105407	31.3866%	20.7532%	47.8603%
6	0.111360	28.2684%	28.8407%	42.8909%
7	0.117174	26.2062%	27.4753%	46.3186%
8	0.118613	27.6178%	26.8247%	45.5575%
9	0.126520	26.6387%	26.7324%	46.6288%
10	0.131424	27.6050%	27.3017%	45.0933%
11	0.137016	26.1713%	31.6779%	42.1508%
12	0.138594	26.9479%	31.4030%	41.6490%
13	0.140941	26.1089%	32.2350%	41.6561%
14	0.141504	26.5635%	32.0582%	41.3782%
15	0.141954	26.5516%	32.2790%	41.1695%
16	0.142299	26.7357%	32.1304%	41.1339%
17	0.142417	26.7138%	32.1486%	41.1376%
18	0.142641	26.8476%	32.0693%	41.0832%
19	0.142897	26.7650%	32.1221%	41.1129%
20	0.143754	26.7243%	31.7634%	41.5123%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.007436	5.25195%	85.2887%	9.45939%
2	0.007672	7.10733%	81.5681%	11.3246%
3	0.008599	10.0808%	75.3903%	14.5289%
4	0.009494	11.0938%	65.1604%	23.7458%
5	0.009977	11.5890%	63.6398%	24.7712%
6	0.010273	14.6060%	61.9437%	23.4502%
7	0.010372	14.3309%	61.0907%	24.5784%
8	0.010826	13.2529%	56.7505%	29.9966%
9	0.011045	15.9174%	54.5683%	29.5142%
10	0.011156	15.6089%	54.5100%	29.8811%
11	0.011188	15.5827%	54.2165%	30.2008%
12	0.011231	15.8307%	53.8512%	30.3182%
13	0.011457	15.2829%	54.5116%	30.2055%
14	0.011582	15.1256%	54.2123%	30.6621%
15	0.011644	15.5672%	53.7851%	30.6477%
16	0.011739	15.3221%	53.8662%	30.8117%
17	0.011882	15.2272%	52.9710%	31.8018%
18	0.011969	15.8019%	52.7082%	31.4899%
19	0.012026	15.6887%	52.7807%	31.5305%
20	0.012136	15.4467%	52.1736%	32.3797%

Variance Decomposition of Δ*MPR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.635703	36.0150%	1.21967%	62.7653%
2	0.682198	34.7982%	5.45502%	59.7467%
3	0.686465	34.4446%	6.26767%	59.2877%
4	0.735096	35.6278%	8.14906%	56.2232%
5	0.744836	36.1822%	8.01192%	55.8059%
6	0.751635	35.7761%	8.16438%	56.0595%
7	0.771881	34.1932%	9.62060%	56.1862%
8	0.794410	33.5400%	10.6461%	55.8140%
9	0.804664	33.7953%	11.8011%	54.4035%
10	0.808559	34.2477%	11.7296%	54.0227%
11	0.818242	33.5574%	11.6240%	54.8186%
12	0.834253	32.6049%	14.5921%	52.8029%
13	0.839979	32.1882%	15.7262%	52.0856%
14	0.840614	32.1603%	15.7927%	52.0469%
15	0.845851	31.8135%	15.6105%	52.5759%
16	0.853916	31.6574%	15.6090%	52.7335%
17	0.860595	31.9794%	15.4511%	52.5695%
18	0.865422	32.2690%	15.7440%	51.9870%
19	0.865570	32.2602%	15.7391%	52.0008%
20	0.866001	32.2344%	15.8130%	51.9526%

TABLE 32
STRUCTURAL VECTOR AUTOREGRESSION, NIGERIA, SB OF SB OF 2014*M7*

Sample (adjusted): 2014M07 2022M11 Included observations: 78 after adjustments Estimation method: Maximum likelihood Structural VAR is just-identified

B =

C(1)	0	0
C(2)	C(4)	0
C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	−1.099837	0.088059	−12.48978	0.0000
C(2)	−0.143741	0.011597	−12.39493	0.0000
C(3)	−6.352122	0.520012	−12.21533	0.0000
C(4)	−0.012598	0.001009	−12.48999	0.0000
C(5)	−0.746927	0.090426	−8.260109	0.0000
C(6)	0.599035	0.047961	12.48999	0.0000
Log likelihood	417.1988			

Estimated S matrix:

0.007673	0.099281	0.098002
−0.001472	0.000456	−0.000755
−0.130751	−0.208708	0.152393

Estimated B matrix:

−1.099837	0.000000	0.000000
−0.143741	−0.012598	0.000000
−6.352122	−0.746927	0.599035

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 33
IMPULSE RESPONSE FUNCTION, NIGERIA, SB OF 2014*M7*

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	0.77%	9.93%	9.80%
2	0.00%	14.32%	9.08%
3	0.97%	12.87%	4.22%
4	−0.22%	11.09%	2.43%
5	−1.64%	10.92%	−0.19%
6	−1.95%	10.06%	0.33%
7	−1.07%	11.28%	−0.53%

8	−1.23%	11.29%	−1.08%
9	−0.86%	13.45%	−3.30%
10	−0.96%	12.50%	−3.68%
11	−2.11%	11.94%	−5.02%
12	−3.19%	11.19%	−3.80%
13	−3.71%	11.90%	−5.35%
14	−3.24%	11.74%	−5.20%
15	−3.78%	11.63%	−6.37%
16	−4.58%	10.71%	−5.85%
17	−5.71%	10.72%	−6.42%
18	−6.38%	10.88%	−5.58%
19	−7.25%	10.98%	−6.09%
20	−7.86%	10.82%	−5.98%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	−0.15%	0.05%	−0.08%
2	−0.26%	0.09%	−0.15%
3	−0.38%	0.13%	−0.23%
4	−0.51%	0.19%	−0.34%
5	−0.60%	0.24%	−0.45%
6	−0.64%	0.29%	−0.57%
7	−0.66%	0.32%	−0.67%
8	−0.70%	0.33%	−0.72%
9	−0.74%	0.29%	−0.77%
10	−0.79%	0.26%	−0.80%
11	−0.86%	0.22%	−0.80%
12	−0.93%	0.16%	−0.81%
13	−1.04%	0.11%	−0.81%
14	−1.15%	0.08%	−0.80%
15	−1.28%	0.06%	−0.79%
16	−1.39%	0.06%	−0.79%
17	−1.52%	0.07%	−0.79%
18	−1.63%	0.08%	−0.80%
19	−1.74%	0.08%	−0.82%
20	−1.84%	0.09%	−0.83%

Accumulated Response of Δ*MPR*:

Period	Shock1	Shock2	Shock3
1	−13.08%	−20.87%	15.24%
2	−16.94%	−19.18%	13.99%
3	−26.04%	−18.14%	22.59%
4	−28.69%	−13.30%	17.91%
5	−36.11%	−23.93%	25.28%
6	−49.82%	−18.34%	18.38%
7	−56.42%	−17.97%	27.78%
8	−61.13%	−10.88%	20.28%

9	−63.37%	−11.01%	24.41%
10	−69.88%	−9.57%	17.72%
11	−70.78%	−12.09%	20.50%
12	−74.71%	−11.18%	15.83%
13	−77.36%	−12.70%	22.75%
14	−81.62%	−15.66%	19.62%
15	−84.58%	−17.02%	22.30%
16	−90.18%	−18.44%	21.31%
17	−94.37%	−20.12%	24.23%
18	−100.94%	−21.84%	23.77%
19	−106.09%	−20.80%	25.58%
20	−111.69%	−21.19%	25.56%

TABLE 34
VARIANCE DECOMPOSITION, NIGERIA, SB OF 2014*M7*

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.139714	0.30161%	50.4954%	49.2030%
2	0.146840	0.54507%	54.6702%	44.7847%
3	0.155645	0.87142%	49.5293%	49.5993%
4	0.158131	1.40829%	49.2488%	49.3429%
5	0.160921	2.13530%	47.5677%	50.2970%
6	0.161262	2.16440%	47.6471%	50.1885%
7	0.162182	2.43588%	47.6676%	49.8965%
8	0.162285	2.44324%	47.6072%	49.9496%
9	0.165251	2.40735%	47.6090%	49.9837%
10	0.165568	2.40157%	47.7537%	49.8447%
11	0.166598	2.84735%	47.2795%	49.8732%
12	0.167558	3.23086%	46.9403%	49.8288%
13	0.168505	3.29048%	46.5952%	50.1144%
14	0.168586	3.36559%	46.5599%	50.0745%
15	0.169083	3.44860%	46.2904%	50.2611%
16	0.169598	3.64853%	46.3018%	50.0496%
17	0.170067	4.06914%	46.0466%	49.8843%
18	0.170412	4.20770%	45.8698%	49.9225%
19	0.170716	4.45590%	45.7100%	49.8341%
20	0.170836	4.57539%	45.6556%	49.7690%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.001716	73.5732%	7.06932%	19.3575%
2	0.002245	69.9778%	8.04039%	21.9818%
3	0.002722	67.1632%	8.05838%	24.7784%
4	0.003244	63.1929%	8.98227%	27.8248%
5	0.003567	58.1775%	9.27244%	32.5501%
6	0.003810	52.1505%	9.76599%	38.0836%
7	0.003981	48.0476%	9.65836%	42.2941%
8	0.004028	48.0382%	9.43720%	42.5246%

9	0.004086	47.5228%	9.76633%	42.7108%
10	0.004142	47.6925%	10.2522%	42.0552%
11	0.004212	48.6536%	10.6464%	40.7000%
12	0.004321	49.2185%	12.1026%	38.6789%
13	0.004472	51.1691%	12.7000%	36.1309%
14	0.004632	53.9611%	12.3074%	33.7315%
15	0.004798	56.8903%	11.6222%	31.4874%
16	0.004944	59.3993%	10.9477%	29.6530%
17	0.005095	61.7547%	10.3247%	27.9205%
18	0.005225	63.5664%	9.84650%	26.5871%
19	0.005331	64.9100%	9.48367%	25.6064%
20	0.005425	66.0482%	9.18434%	24.7675%

Variance Decomposition of Δ*MPR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.289618	20.3818%	51.9311%	27.6871%
2	0.292934	21.6605%	51.0931%	27.2463%
3	0.318776	26.4525%	43.2533%	30.2942%
4	0.326880	25.8117%	43.3236%	30.8647%
5	0.359310	25.6291%	44.6152%	29.7557%
6	0.394704	33.3081%	38.9788%	27.7131%
7	0.411089	33.2828%	35.9420%	30.7752%
8	0.426456	32.1467%	36.1602%	31.6931%
9	0.429038	32.0324%	35.7272%	32.2403%
10	0.439320	32.7513%	34.1817%	33.0670%
11	0.441008	32.5427%	34.2471%	33.2102%
12	0.445292	32.6958%	33.6336%	33.6706%
13	0.451671	32.1236%	32.8035%	35.0729%
14	0.455721	32.4299%	32.6457%	34.9245%
15	0.457671	32.5726%	32.4565%	34.9709%
16	0.461410	33.5207%	32.0267%	34.4526%
17	0.464532	33.8841%	31.7296%	34.3863%
18	0.469485	35.1292%	31.1967%	33.6742%
19	0.472761	35.8315%	30.8133%	33.3552%
20	0.476077	36.7157%	30.3921%	32.8922%

TABLE 35
STRUCTURAL VECTOR AUTOREGRESSION, CANADA, SB OF SB OF 1990$_{M11}$

Sample: 1990M11 1999M12
Included observations: 110
Estimation method: Maximum likelihood Structural VAR is just-identified

B =			
	C(1)	0	0
	C(2)	C(4)	0
	C(3)	C(5)	C(6)

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.077417	0.005219	14.83239	0.0000
C(2)	−0.001308	0.000506	−2.584550	0.0098
C(3)	−0.293609	0.050729	−5.787798	0.0000
C(4)	0.005226	0.000352	14.83239	0.0000
C(5)	−0.402221	0.038029	−10.57663	0.0000
C(6)	0.279631	0.018853	14.83239	0.0000
Log likelihood	502.2165			
Estimated S matrix:				
0.051754	0.042615	0.015659		
−0.003169	0.003230	−0.001436		
−0.157587	−0.000944	0.429523		
Estimated B matrix:				
0.077417	0.000000	0.000000		
−0.001308	0.005226	0.000000		
−0.293609	−0.402221	0.279631		

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 36
IMPULSE RESPONSE FUNCTION, CANADA, SB OF 1990$_{M11}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	5.18%	4.26%	1.57%
2	7.15%	3.64%	2.34%
3	7.30%	2.99%	1.94%
4	7.93%	2.44%	1.44%
5	7.91%	1.83%	0.94%
6	7.26%	0.77%	0.28%
7	6.81%	1.26%	0.14%
8	5.90%	1.28%	0.43%
9	6.10%	1.85%	−0.15%
10	6.44%	1.52%	−0.90%
11	7.07%	0.70%	−1.14%
12	8.25%	0.15%	0.29%
13	8.84%	−0.18%	0.50%
14	9.16%	−0.85%	0.30%
15	8.92%	−0.74%	0.31%
16	8.65%	−0.81%	0.25%
17	8.03%	−0.81%	0.03%

18	7.75%	−0.84%	0.21%
19	7.51%	−0.61%	0.28%
20	7.32%	−0.21%	−0.02%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	−0.32%	0.32%	−0.14%
2	−0.27%	0.31%	−0.11%
3	−0.32%	0.35%	−0.07%
4	−0.28%	0.45%	−0.01%
5	−0.31%	0.42%	−0.03%
6	−0.24%	0.52%	−0.02%
7	−0.16%	0.55%	−0.05%
8	−0.19%	0.54%	−0.05%
9	−0.17%	0.59%	0.00%
10	−0.13%	0.56%	−0.01%
11	−0.13%	0.60%	−0.04%
12	−0.14%	0.57%	0.03%
13	−0.23%	0.67%	0.01%
14	−0.16%	0.62%	0.02%
15	−0.16%	0.60%	0.03%
16	−0.14%	0.59%	0.00%
17	−0.13%	0.60%	−0.02%
18	−0.13%	0.61%	−0.01%
19	−0.10%	0.60%	−0.01%
20	−0.12%	0.57%	0.01%

Accumulated Response of Δ*ONR*:

Period	Shock1	Shock2	Shock3
1	−15.76%	−0.09%	42.95%
2	−14.19%	−6.97%	52.36%
3	−7.40%	−7.84%	47.93%
4	−14.68%	−16.67%	42.85%
5	−13.48%	−19.63%	32.57%
6	−16.14%	−13.89%	27.57%
7	−21.01%	−15.71%	23.36%
8	−22.66%	−16.44%	28.77%
9	−24.68%	−18.04%	26.19%
10	−27.97%	−21.89%	30.52%
11	−26.96%	−35.67%	32.94%
12	−19.64%	−44.21%	35.76%
13	−13.32%	−56.23%	30.29%
14	−13.50%	−55.87%	23.56%
15	−17.05%	−52.16%	21.80%
16	−19.47%	−49.67%	19.75%
17	−24.49%	−46.97%	28.45%
18	−28.97%	−49.10%	31.78%
19	−30.20%	−49.33%	34.66%
20	−30.48%	−50.72%	32.95%

TABLE 37
VARIANCE DECOMPOSITION, CANADA, SB OF 1990$_{M11}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.068846	56.51%	38.32%	5.17%
2	0.072304	58.68%	35.48%	5.85%
3	0.072729	58.04%	35.87%	6.09%
4	0.073376	57.76%	35.79%	6.45%
5	0.073796	57.11%	36.06%	6.83%
6	0.075136	55.83%	36.80%	7.37%
7	0.075443	55.74%	36.92%	7.34%
8	0.076053	56.30%	36.33%	7.37%
9	0.076506	55.71%	36.45%	7.84%
10	0.077023	55.15%	36.15%	8.70%
11	0.077752	54.79%	36.59%	8.63%
12	0.080114	53.76%	34.93%	11.30%
13	0.080427	53.89%	34.83%	11.28%
14	0.080787	53.57%	35.19%	11.24%
15	0.080831	53.60%	35.17%	11.23%
16	0.080881	53.64%	35.14%	11.22%
17	0.081147	53.87%	34.91%	11.22%
18	0.081218	53.90%	34.85%	11.25%
19	0.081287	53.90%	34.86%	11.24%
20	0.081463	53.72%	34.96%	11.33%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.004747	44.56%	46.29%	9.15%
2	0.004778	44.81%	45.79%	9.40%
3	0.004837	44.58%	45.30%	10.12%
4	0.00499	42.37%	46.69%	10.93%
5	0.005006	42.32%	46.68%	11.00%
6	0.005142	41.80%	47.73%	10.46%
7	0.005224	42.87%	46.62%	10.50%
8	0.005233	43.05%	46.48%	10.47%
9	0.005285	42.43%	46.34%	11.23%
10	0.005309	42.54%	46.26%	11.20%
11	0.00533	42.20%	46.44%	11.35%
12	0.005378	41.49%	45.96%	12.56%
13	0.005543	41.46%	46.68%	11.86%
14	0.00561	42.17%	46.24%	11.58%

15	0.005617	42.08%	46.34%	11.58%
16	0.005627	42.06%	46.18%	11.77%
17	0.005631	42.05%	46.11%	11.85%
18	0.005634	42.01%	46.12%	11.86%
19	0.005641	42.13%	46.03%	11.83%
20	0.005653	42.01%	46.09%	11.89%

Variance Decomposition of Δ*ONR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.45752	11.86%	0.00%	88.14%
2	0.472372	11.24%	2.12%	86.64%
3	0.479348	12.92%	2.09%	84.99%
4	0.495433	14.25%	5.13%	80.61%
5	0.50699	13.67%	5.24%	81.09%
6	0.513362	13.60%	6.36%	80.04%
7	0.517706	14.25%	6.38%	79.37%
8	0.520839	14.18%	6.32%	79.49%
9	0.522114	14.26%	6.39%	79.35%
10	0.526344	14.43%	6.82%	78.76%
11	0.544712	13.50%	12.77%	73.73%
12	0.556935	14.65%	14.57%	70.79%
13	0.575857	14.90%	17.98%	67.11%
14	0.579792	14.70%	17.74%	67.55%
15	0.582332	14.95%	17.99%	67.06%
16	0.583721	15.05%	18.09%	66.86%
17	0.592924	15.30%	17.74%	66.96%
18	0.595926	15.71%	17.69%	66.60%
19	0.596752	15.71%	17.64%	66.64%
20	0.597165	15.69%	17.67%	66.63%

TABLE 38
STRUCTURAL VECTOR AUTOREGRESSION, CANADA, SB OF 2008$_{M8}$

Sample: 2008M08 2012M01
Included observations: 42
Estimation method: Maximum likelihood Structural VAR is just-identified

B =			
C(1)	0	0	
C(2)	C(4)	0	
C(3)	C(5)	C(6)	

	Coefficient	Std. Error	*z*-Statistic	*p*-Value
C(1)	0.170675	0.018622	9.165133	0.0000
C(2)	0.005548	0.000627	8.841638	0.0000
C(3)	0.763220	0.098894	7.717565	0.0000
C(4)	0.001071	0.000117	9.165153	0.0000
C(5)	−0.010981	0.053329	−0.205911	0.8369
C(6)	0.345523	0.037700	9.165150	0.0000

Log likelihood	254.3209

Estimated S matrix:		
0.060063	0.015023	−0.046361
0.000793	0.003165	−0.001326
0.135407	0.006645	0.088532
Estimated B matrix:		
0.170675	0.000000	0.000000
0.005548	0.001071	0.000000
0.763220	−0.010981	0.345523

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 39
IMPULSE RESPONSE FUNCTION, CANADA, SB OF 2008$_{M8}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	6.01%	1.50%	−4.64%
2	9.80%	2.97%	−5.33%
3	11.91%	1.49%	−4.81%
4	14.06%	−0.42%	−5.54%
5	18.37%	0.36%	−4.01%
6	18.25%	−1.06%	−5.34%
7	18.27%	0.82%	−2.53%
8	16.16%	−2.06%	0.25%
9	15.74%	−0.36%	1.58%
10	16.14%	−0.76%	2.65%
11	15.00%	−0.92%	2.72%
12	15.42%	1.34%	2.24%
13	15.34%	0.69%	0.36%
14	16.00%	1.56%	−1.17%
15	17.47%	0.34%	−1.56%
16	17.87%	−0.33%	−2.09%
17	19.30%	−0.03%	−1.54%
18	18.46%	−0.14%	−1.27%
19	17.70%	0.07%	−0.65%
20	17.08%	−0.88%	0.78%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	0.08%	0.32%	−0.13%
2	0.04%	0.14%	−0.29%
3	0.03%	0.15%	−0.27%
4	0.23%	0.04%	−0.30%
5	0.31%	0.07%	−0.30%
6	0.29%	0.17%	−0.32%
7	0.21%	0.14%	−0.20%
8	0.13%	0.05%	−0.16%
9	0.24%	0.06%	−0.09%
10	0.30%	0.05%	−0.02%
11	0.28%	0.10%	−0.02%
12	0.25%	0.24%	−0.06%
13	0.26%	0.14%	−0.13%
14	0.33%	0.13%	−0.15%
15	0.46%	0.09%	−0.14%
16	0.52%	0.07%	−0.10%
17	0.51%	0.16%	−0.11%
18	0.46%	0.16%	−0.12%
19	0.45%	0.07%	−0.07%
20	0.50%	0.05%	0.00%

Accumulated Response of Δ*ONR*:

Period	Shock1	Shock2	Shock3
1	13.54%	0.66%	8.85%
2	15.07%	0.14%	8.39%
3	24.57%	5.87%	10.96%
4	31.15%	−3.08%	13.56%
5	38.94%	3.56%	11.08%
6	47.58%	4.08%	10.82%
7	51.07%	−2.55%	15.39%
8	55.20%	1.95%	19.62%
9	59.45%	−1.22%	21.59%
10	61.75%	−3.75%	26.24%
11	64.27%	0.33%	29.97%
12	63.96%	−0.21%	30.18%
13	66.17%	−1.52%	33.10%
14	67.59%	1.03%	33.02%
15	70.56%	0.15%	31.57%
16	72.74%	−2.07%	32.41%
17	74.79%	1.73%	31.45%
18	76.13%	0.03%	30.55%
19	75.98%	−1.95%	31.49%
20	77.72%	−0.35%	33.31%

TABLE 40
VARIANCE DECOMPOSITION, CANADA, SB OF 2008$_{M8}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.077347	60.30%	3.77%	35.93%
2	0.087658	65.68%	5.72%	28.60%
3	0.091513	65.57%	7.86%	26.56%
4	0.096203	64.35%	11.03%	24.62%
5	0.106774	68.47%	9.49%	22.04%
6	0.108535	66.28%	10.89%	22.83%
7	0.113688	60.41%	12.68%	26.92%
8	0.122385	55.12%	16.51%	28.37%
9	0.124346	53.51%	17.87%	28.63%
10	0.124932	53.11%	17.80%	29.09%
11	0.125461	53.48%	17.66%	28.85%
12	0.127636	51.79%	20.20%	28.01%
13	0.129186	50.55%	19.97%	29.47%
14	0.130546	49.76%	20.00%	30.24%
15	0.131981	49.92%	20.41%	29.67%
16	0.132323	49.75%	20.57%	29.68%
17	0.133253	50.23%	20.34%	29.44%
18	0.133554	50.40%	20.25%	29.35%
19	0.133927	50.44%	20.16%	29.40%
20	0.135157	49.74%	20.28%	29.98%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.003522	5.06%	80.76%	14.18%
2	0.004243	4.48%	72.38%	23.14%
3	0.004245	4.47%	72.31%	23.22%
4	0.004818	20.18%	61.56%	18.27%
5	0.0049	22.35%	59.99%	17.66%
6	0.005019	21.51%	61.43%	17.06%
7	0.005228	22.56%	56.95%	20.49%
8	0.005379	23.23%	56.81%	19.97%
9	0.005526	25.67%	53.86%	20.48%
10	0.005616	26.17%	52.18%	21.65%
11	0.005644	26.06%	52.50%	21.43%
12	0.005843	24.62%	54.90%	20.48%
13	0.005982	23.54%	55.69%	20.77%
14	0.006024	24.52%	54.92%	20.57%
15	0.00618	27.88%	52.57%	19.55%
16	0.006219	28.29%	52.01%	19.70%
17	0.006284	27.73%	52.96%	19.31%
18	0.006302	28.14%	52.65%	19.21%
19	0.00639	27.41%	53.26%	19.33%
20	0.006448	27.47%	52.43%	20.11%

Variance Decomposition of Δ*ONR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.161917	69.94%	0.17%	29.90%
2	0.162784	70.07%	0.27%	29.66%
3	0.198704	69.93%	8.50%	21.58%
4	0.22912	60.84%	21.65%	17.51%
5	0.252151	59.76%	24.81%	15.43%
6	0.266626	63.96%	22.23%	13.81%
7	0.280679	59.26%	25.63%	15.11%
8	0.290348	57.40%	26.35%	16.25%
9	0.295795	57.37%	26.53%	16.09%
10	0.30139	55.85%	26.27%	17.89%
11	0.30745	54.34%	27.00%	18.66%
12	0.307519	54.32%	27.02%	18.66%
13	0.309962	53.98%	26.77%	19.25%
14	0.311329	53.71%	27.21%	19.08%
15	0.313195	53.97%	26.96%	19.07%
16	0.314849	53.88%	27.18%	18.94%
17	0.317944	53.26%	28.08%	18.66%
18	0.3188	53.15%	28.21%	18.64%
19	0.31956	52.90%	28.46%	18.64%
20	0.320941	52.73%	28.46%	18.80%

TABLE 41
STRUCTURAL VECTOR AUTOREGRESSION, CANADA, SB OF 2014$_{M8}$

Sample (adjusted): 2014M08 2023M11 Included observations: 112 after adjustments Estimation method: Maximum likelihood Structural VAR is just-identified

B =					
	C(1)	0	0		
	C(2)	C(4)	0		
	C(3)	C(5)	C(6)		
		Coefficient	Std. Error	*z*-Statistic	*p*-Value
	C(1)	0.083600	0.005586	14.96663	0.0000
	C(2)	0.006775	0.001018	6.651652	0.0000
	C(3)	0.401920	0.050468	7.963793	0.0000
	C(4)	0.009656	0.000645	14.96663	0.0000
	C(5)	0.363099	0.035176	10.32248	0.0000
	C(6)	0.269554	0.018010	14.96663	0.0000
Log likelihood	616.2769				
Estimated S matrix:					
	0.111468	0.003679	0.043358		
	0.000758	0.002673	0.001535		
	0.010573	−0.076946	0.163568		
Estimated B matrix:					
	0.083600	0.000000	0.000000		
	0.006775	0.009656	0.000000		
	0.401920	0.363099	0.269554		

Note:
C(1): Coefficient of Real Crude Oil Price in the Crude Oil Price Equation.
C(2): Coefficient of Real Crude Oil Price in the Inflation Rate Equation.
C(3): Coefficient of Real Crude Oil Price in the Interest Rate Equation.
C(4): Coefficient of Inflation Rate in the Inflation Rate Equation.
C(5): Coefficient of Inflation Rate in the Interest Rate Equation.
C(6): Coefficient of Interest Rate in the Interest Rate Equation.

TABLE 42
IMPULSE RESPONSE FUNCTION, CANADA, SB OF 2014$_{M8}$

Accumulated Response of Δlog(*ROIL*):

Period	Shock1	Shock2	Shock3
1	11.15%	0.37%	4.34%
2	14.59%	0.43%	5.77%
3	13.59%	1.57%	2.42%
4	11.16%	2.50%	2.39%
5	9.94%	3.83%	2.55%
6	10.31%	3.72%	1.62%
7	11.28%	1.90%	1.43%
8	12.17%	1.69%	2.45%
9	12.16%	2.24%	2.39%
10	11.33%	1.47%	1.47%
11	11.60%	2.03%	0.19%
12	11.43%	1.18%	−2.04%
13	9.24%	1.21%	−0.78%
14	9.80%	1.97%	−0.47%
15	9.24%	1.99%	0.51%
16	9.96%	2.72%	0.32%
17	10.78%	3.03%	−0.12%
18	10.78%	2.31%	−0.37%
19	10.31%	1.80%	−0.93%
20	9.03%	1.73%	−0.42%

Accumulated Response of Δlog(*CPI2020*):

Period	Shock1	Shock2	Shock3
1	0.08%	0.27%	0.15%
2	0.20%	0.30%	0.21%
3	0.18%	0.31%	0.22%
4	0.21%	0.37%	0.17%
5	0.21%	0.37%	0.20%
6	0.28%	0.40%	0.21%
7	0.30%	0.40%	0.19%
8	0.30%	0.40%	0.19%
9	0.34%	0.41%	0.16%
10	0.35%	0.41%	0.17%
11	0.36%	0.43%	0.13%
12	0.42%	0.47%	0.13%
13	0.48%	0.61%	0.20%
14	0.50%	0.67%	0.22%
15	0.51%	0.67%	0.19%
16	0.52%	0.73%	0.17%
17	0.54%	0.74%	0.16%
18	0.56%	0.74%	0.15%
19	0.58%	0.74%	0.14%
20	0.57%	0.73%	0.12%

Accumulated Response of Δ*ONR*:

Period	Shock1	Shock2	Shock3
1	1.06%	−7.69%	16.36%
2	6.35%	−6.87%	17.61%
3	6.66%	−5.49%	21.79%
4	6.00%	−4.90%	26.56%
5	6.38%	−1.41%	28.63%
6	6.51%	−2.35%	32.30%
7	9.27%	0.18%	35.29%
8	9.75%	1.36%	37.18%
9	10.62%	3.02%	37.50%
10	15.97%	6.14%	36.36%
11	19.57%	7.18%	34.64%
12	20.92%	8.19%	33.39%
13	21.64%	7.65%	32.41%
14	22.31%	10.21%	32.54%
15	24.51%	12.97%	32.43%
16	26.94%	14.01%	32.71%
17	29.55%	16.31%	32.86%
18	30.97%	16.99%	33.30%
19	30.48%	18.78%	34.69%
20	30.77%	20.37%	34.75%

TABLE 43
VARIANCE DECOMPOSITION, CANADA, SB OF 2014$_{M8}$

Variance Decomposition of Δlog(*ROIL*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.11966	86.78%	0.09%	13.13%
2	0.125349	86.64%	0.09%	13.27%
3	0.130644	80.35%	0.84%	18.81%
4	0.133209	80.61%	1.30%	18.10%
5	0.13444	79.97%	2.25%	17.78%
6	0.134822	79.59%	2.25%	18.16%
7	0.136406	78.26%	3.98%	17.76%
8	0.137092	77.90%	3.96%	18.14%
9	0.137205	77.77%	4.12%	18.11%
10	0.137984	77.25%	4.39%	18.36%
11	0.138713	76.48%	4.51%	19.01%
12	0.140766	74.28%	4.74%	20.98%
13	0.143006	74.31%	4.60%	21.10%
14	0.143353	74.10%	4.86%	21.04%
15	0.143794	73.80%	4.83%	21.37%
16	0.144169	73.66%	5.06%	21.28%
17	0.144501	73.65%	5.08%	21.27%
18	0.1447	73.44%	5.31%	21.25%
19	0.144973	73.27%	5.41%	21.32%
20	0.145626	73.38%	5.37%	21.25%

Variance Decomposition of Δlog(*CPI2020*):

Period	S.E.	Shock1	Shock2	Shock3
1	0.003175	5.70%	70.92%	23.37%
2	0.003484	17.71%	60.04%	22.25%
3	0.003492	18.04%	59.76%	22.19%
4	0.003608	17.60%	59.51%	22.89%
5	0.003628	17.42%	58.86%	23.71%
6	0.003723	20.86%	56.61%	22.52%
7	0.003734	21.06%	56.29%	22.65%
8	0.003735	21.09%	56.25%	22.65%
9	0.003771	21.99%	55.21%	22.80%
10	0.003774	22.03%	55.14%	22.83%
11	0.003807	21.71%	54.27%	24.02%
12	0.00389	23.48%	53.50%	23.02%
13	0.004207	21.67%	56.22%	22.11%
14	0.004261	21.56%	56.65%	21.78%
15	0.004271	21.46%	56.39%	22.14%
16	0.004311	21.11%	56.95%	21.94%
17	0.004322	21.39%	56.73%	21.88%
18	0.004328	21.56%	56.58%	21.86%
19	0.004333	21.66%	56.45%	21.89%
20	0.004338	21.73%	56.34%	21.93%

Variance Decomposition of Δ*ONR*:

Period	S.E.	Shock1	Shock2	Shock3
1	0.181072	0.34%	18.06%	81.60%
2	0.189229	8.12%	16.72%	75.15%
3	0.194312	7.73%	16.36%	75.91%
4	0.200282	7.38%	15.49%	77.13%
5	0.204377	7.12%	17.78%	75.09%
6	0.207858	6.89%	17.39%	75.71%
7	0.213307	8.21%	17.93%	73.86%
8	0.214519	8.17%	18.02%	73.81%
9	0.215363	8.27%	18.48%	73.25%
10	0.224368	13.30%	18.95%	67.75%
11	0.228123	15.35%	18.55%	66.10%
12	0.229087	15.57%	18.58%	65.84%
13	0.229474	15.62%	18.58%	65.81%
14	0.230995	15.50%	19.56%	64.94%
15	0.233679	16.03%	20.51%	63.46%
16	0.235186	16.89%	20.44%	62.67%
17	0.237745	17.74%	20.93%	61.33%
18	0.238306	18.01%	20.92%	61.07%
19	0.239428	17.88%	21.28%	60.84%
20	0.239979	17.81%	21.62%	60.56%