

MONETARY POLICY SPILLOVERS FROM THE U.S. AND CHINA TO VIETNAM: A BAYESIAN VECTOR AUTOREGRESSIVE MODEL

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ABSTRACT

This study examines the asymmetric spillover effects of monetary policy tightening in the United States and China on a small, dual-exposed emerging Vietnam economy. It investigates how changes in the Federal Reserve's federal funds rate and the People's Bank of China's benchmark lending rate transmit through financial and trade channels to shape Vietnam's macroeconomic outcomes. Using a Bayesian Vector Autoregressive model and quarterly data from 2005 to 2024, we estimate Vietnam's macroeconomic responses to policy rate shocks originating from the Federal Reserve and the People's Bank of China. Our results confirm that United States monetary tightening induces immediate but statistically insignificant depreciation of the Vietnamese dong and sharp, reversible portfolio outflows, with muted impacts on GDP and inflation due to effective State Bank of Vietnam interventions. In contrast, Chinese rate hikes generate significant short-term import-price pressures, raising CPI by as much as 1.7 % and prompting a stronger State Bank of Vietnam policy response. Neither source of external tightening yields lasting output effects, suggesting that Vietnam's domestic policy framework effectively buffers adverse impulses. These findings underscore the imperative for monetary authorities to employ an integrated policy toolkit capable of distinguishing overlapping external shocks. This study contributes a unified empirical framework that disentangles simultaneous spillovers from the world's two largest monetary powers, offering generalizable guidance for policy design in similarly dual-dependent emerging markets.

Keywords: *monetary policy spillovers, Bayesian vector autoregression, financial transmission channels, Vietnam*

1. INTRODUCTION

The worldwide economic environment has experienced growing influence from both rising policy uncertainty and more frequent external disturbances during recent years. This trend became particularly acute since the Federal Reserve (Fed)'s monetary tightening cycle in 2022, which was implemented to curb post-pandemic inflation. At the same time, the People's Bank of China (PBoC) initiated a gradual reform of its monetary policy framework, transitioning from quantity-based instruments (e.g., on M2) toward more price-based tools (El-Shagi & Jiang, 2023). These abrupt changes in the policy stances of major economies have not only disrupted global capital flows but also exerted significant pressure on exchange rates and overall

macro-financial stability in small open economies with limited policy autonomy (Ahmed et al., 2024; Beirne et al., 2023; Cheng & You, 2025; Ha et al., 2023; Lastauskas & Nguyen, 2024; Yordanova & Hristizov, 2025).

Research has shown that the United States (U.S.) monetary policy plays a key role in driving global financial cycles and influencing the financial conditions in emerging and developing economies (Albrizio et al., 2020; Arbatli-Saxegaard et al., 2022; Kalemli-Özcan, 2019; Miranda-Agrippino & Rey, 2020). The Fed's policy changes trigger rapid financial transmission through interest rates and capital flows, yet output and price effects usually appear after delays (Georgiadis, 2016; Ha et al., 2023). By contrast, the monetary policy of China has gained increasing recognition for its Asian trade and commodity price effects (Beirne et al., 2023; Chen et al., 2023; Lei et al., 2024; Todorova et al., 2025a). With China now serving as Vietnam's largest trading partner and the U.S. as its top export destination, recent studies have documented that monetary tightening by the PBoC can lead to real depreciation of regional currencies, shifts in trade balances, and heightened imported inflation in economies with strong trade ties to China (Cho & Kim, 2021; Tran et al., 2021; Hosni et al., 2025).

As a small and highly open economy, Vietnam is highly sensitive to external monetary shocks due to its dual exposure: financial interdependence with the U.S. and deep trade integration with China. The structural characteristics underscore Vietnam's heightened vulnerability to monetary shocks originating from the world's two major financial centers.

However, the domestic monetary policy responses by the State Bank of Vietnam (SBV) such as policy rate adjustments and exchange rate interventions, remain largely reactive and short-term, in part due to the absence of a comprehensive analytical framework for assessing dual monetary spillovers from the U.S. and China (ASEAN+3 Macroeconomic Research Office (AMRO), 2024; Dang & Pham, 2024; IMF, 2024). This lack of a unified framework raises the risk of policy miscalibration, especially when external shocks from the U.S. and China occur simultaneously but in opposite directions. In the absence of timely and country-specific analysis, the SBV may under- or overreact, leading to suboptimal macroeconomic outcomes.

Although international monetary spillovers have been widely studied, a notable gap remains in the literature. To date, no empirical study has simultaneously examined the spillover effects of both U.S. and Chinese monetary policies on Vietnam within a unified analytical framework. Most existing studies have treated the effects from each country separately, or included Vietnam only as an observational unit in multi-country models without delving into the country's institutional, structural, and policy-response specificities (Beirne et al., 2023; Kim Thi Tran & Nguyen, 2024; Pham & Nguyen, 2019; Tran et al., 2021). This omission is striking, as China is one of Vietnam's largest trade partners and the U.S. remains its leading export market. Such dual exposure has significant policy implications in a globally fragmented environment. Taken together, these considerations make a systematic analysis of U.S. and Chinese monetary spillovers to Vietnam not only timely but also essential for both academic understanding and effective policy formulation.

This study aims to quantify and compare the spillover effects of U.S. and Chinese monetary policy shocks on Vietnam's economy using a Bayesian Vector Autoregressive (BVAR) model. Specifically, it addresses three research questions:

1. To what extent, and through which channels, do monetary policy shocks from the U.S. and China spill over into Vietnam?
2. Do the two sources of shocks differ in their intensity and transmission lags across Vietnam's macro-financial indicators?
3. How does the SBV respond to external monetary shocks?

The paper makes three key contributions. First, it utilizes updated, long-span data for Vietnam, providing country-specific evidence on external monetary transmission. Second, it applies a BVAR approach, which is well-suited for capturing uncertainty and dynamic linkages in small-sample settings. Third, the findings yield policy-relevant insights that can help Vietnamese authorities design more effective responses to external shocks, thereby enhancing macro-financial stability.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature and highlights the research gap. Section 3 describes the methodology and specifies the BVAR model. Sections 4 and 5 present the empirical findings. Section 6 discusses the policy implications. Section 7 concludes and outlines directions for future research.

2. LITERATURE REVIEW

The Mundell–Fleming model posits that monetary policy shocks from major economies can spill over into small, open economies with high capital mobility through interest rate differentials and exchange rate adjustments. Dornbusch extended this framework by incorporating exchange rate expectations, showing that monetary policy also influences asset prices and international capital flows via expectations-based transmission channels (Dornbusch, 1976; Tran & Pham, 2020). These theoretical foundations continue to underpin contemporary analyses of international monetary transmission.

U.S. monetary policy plays a central role in shaping global financial conditions. Recent research highlights the importance of financial channels, namely, bond yields, equity prices, and capital flows, as key conduits of international transmission (Albrizio et al., 2020; Arbatli-Saxegaard et al., 2022; Bagliano & Morana, 2012; Kalemli-Özcan, 2019; Miranda-Agrippino & Rey, 2020; Pham & Nguyen, 2019). Arbatli-Saxegaard et al. have found that long-term bond yields in Asia-Pacific emerging market economies respond significantly to U.S. monetary tightening, whereas responses in GDP and CPI are more muted and delayed (Arbatli-Saxegaard et al., 2022).

Several studies underscore the state-contingent nature of monetary policy spillovers (Yilmazkuday, 2022). Chen and Tillmann show that spillovers tend to intensify during periods of weak domestic demand in the U.S. (Chen and Tillmann, 2025). Ahmed, Akinci, and Queralto note that U.S. demand-driven rate hikes may benefit structurally resilient emerging market economies. In contrast, U.S. hawkish monetary shocks trigger widespread adverse effects across both financial and real sectors (Ahmed et al., 2024).

Structural and institutional characteristics of recipient economies also influence the intensity of monetary policy spillovers (Pham & Nguyen, 2019). Georgiadis emphasizes trade and financial openness, exchange rate regimes, labor market flexibility, and integration into global value chains as key determinants (Georgiadis, 2016). Countries with fixed exchange rates and high capital account openness are more vulnerable to external shocks (Ammer et al., 2016; Georgiadis, 2016; Kalemli-Özcan, 2019; Kim Thi Tran & Nguyen, 2024; Obstfeld et al., 2018). Hoek et al. (2020) highlight the importance of current account positions, foreign exchange reserves, and inflation in shaping sensitivity to global shocks, while (Deng et al., 2022) and (Aizenman et al., 2020) show that capital controls, flexible exchange rates, and macroprudential frameworks can effectively mitigate such risks.

China's monetary policy continues to attract growing academic interest amid its rising prominence in the global economy. Belke, Dubova, and Volz argue that China is emerging as a new regional monetary anchor (Belke et al., 2018). Chen et al. find that monetary policy tightening by the PBoC leads to renminbi appreciation and improves trade balances among Belt and Road countries without reducing output (Chen et al., 2023). Cho and Kim observe

short-term trade deterioration as a result of PBoC easing, followed by medium-term recovery (Cho and Kim, 2021). In contrast, Huang, Xie, and Wang report limited effects in several Asian economies (Huang et al., 2014).

The magnitude and direction of spillover effects from Chinese monetary policy vary considerably across countries, depending on structural characteristics and trade exposure. Research shows that economies with deeper trade linkages to China tend to experience stronger transmission effects (Arslanalp et al., 2016; Chen et al., 2023; Koluk & Mehrotra, 2009; Tran et al., 2021). Koluk & Mehrotra, (2009) find that monetary expansion in China raises GDP in Hong Kong and the Philippines, while (Tran et al., 2021) highlight the roles of exchange rate regimes, capital account liberalization, and trade openness in shaping the magnitude and transmission of these spillovers.

Beirne et al. argue that in some Asian emerging market economies, Chinese monetary policy shocks may exert stronger effects than those from the United States, due to China's dominance in regional supply chains (Beirne et al., 2023). Kim Thi Tran and Nguyen show that ASEAN countries respond to monetary shocks originating from the U.S., Japan, and China, although the dominant transmission channels vary across countries (Tran & Nguyen, 2024).

Nevertheless, China's influence remains constrained in terms of its monetary policy spillover capacity. Fang, Jing, Shi, and Zhao find that G7 policies exert a stronger influence on China than China does on the G7 (Fang et al., 2021). Mwase et al. argue that China's spillover effects are primarily attributed to its central position in global supply chains rather than to its financial dominance (Mwase et al., 2016).

Vietnam constitutes a distinctive yet relatively understudied case in the literature. Despite its simultaneous exposure to U.S. monetary-financial and Chinese trade-related shocks, it is often treated as a peripheral observation in regional modeling frameworks (Kim Thi Tran & Nguyen, 2024; Pham & Nguyen, 2019; Tran et al., 2021; Todorova, et al., 2025b). Vietnam's managed exchange rate regime, high degree of trade openness, and limited capital account liberalization may significantly shape the nature of external policy transmission; yet, such structural asymmetries are not well captured in aggregate frameworks such as the Global Vector Autoregression (GVAR) model.

To the best of our knowledge, no study has applied a Bayesian VAR framework to jointly estimate the spillovers from both U.S. and Chinese monetary policy shocks on Vietnam, nor has any research systematically assessed the policy responses of the SBV within a unified empirical model. It constitutes a notable gap in both empirical analysis and methodological design. Addressing this shortcoming is essential for advancing academic understanding and informing effective policy formulation in the context of Vietnam's dual integration with the world's two leading monetary centers.

3. METHODOLOGY

3.1. MODEL SPECIFICATION

This study employs a BVAR model to assess how the Vietnamese economy responds to monetary policy shocks originating from both the U.S. and China. The BVAR model outperforms traditional VAR models in contexts involving quarterly macroeconomic data and limited observations because it uses prior information to address the over-parameterization issue that occurs when the number of variables and lags exceeds the sample size (Bańbura et al., 2010; Karlsson, 2013; Rudebusch, 1998). BVAR offers a more flexible alternative to Structural VAR (SVAR), as it does not require strong structural assumptions to evaluate dynamic variable responses. That makes it suitable for simulating policy impacts in a small open economy, such as Vietnam. Additionally, BVAR allows for the integration of exogenous factors, including the monetary policy

stances of the U.S and China, as well as global shocks such as financial crises, economic recessions, and the COVID-19 pandemic. Moreover, it enhances model stability in short-term forecasting (Carriero et al., 2019; Doan et al., 1984; Koop & Korobilis, 2010; Litterman, 1980, 1986). The model structure is extended from the basic VAR form to include exogenous variables, which can be expressed as follows:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + B_0 x_t + B_1 x_{t-1} + \dots + B_s x_{t-s} + u_t \quad (1)$$

Where: $y_t = (y_{1t}, y_{2t}, \dots, y_{kt})$ is a vector of k endogenous variables, x_t is a vector of m exogenous variables (including constants, trends, seasonal components, or external shocks), $u_t \sim IID(0, \Sigma)$ is a white noise disturbance vector, assumed to be independently distributed over time.

In this model, we employ three key indicators to capture the monetary policy stances of the U.S., China, and Vietnam: the federal funds rate set by the Fed; the 1-year benchmark lending rate set by the PBoC; and the refinancing rate set by the SBV. Under normal economic conditions, the federal funds rate is widely regarded as the primary indicator of the U.S. monetary policy stance. The Federal Open Market Committee (FOMC) uses this rate to steer monetary and credit conditions toward achieving its dual mandate of price stability and full employment (Bernanke & Blinder, 1992). For China, we use the PBoC's benchmark lending rate as a proxy for the monetary policy stance. This rate was the principal policy instrument before 2014, during a period when the PBoC maintained a highly controlled interest rate regime. Although the PBoC has progressively shifted toward market-based instruments such as the Medium-Term Lending Facility (MLF) and the Loan Prime Rate (LPR) since 2015, the benchmark lending rate continues to play a crucial signaling role by anchoring market expectations and influencing credit conditions. To maintain consistency and comparability in data throughout the 2005-2024 period, this rate remains a theoretically sound and widely accepted proxy for the monetary policy stance in macroeconomic studies, particularly those employing BVAR models (Koluk and Mehrotra, 2009; Chen et al., 2023; El-Shagi and Jiang, 2023). Lastly, a crisis dummy variable (crisis) is introduced as an exogenous control to account for exogenous shocks beyond the regular economic cycle. This variable takes a value of 1 for quarters significantly impacted by major global events, including the global financial crisis (Q4/2007 – Q2/2009), the economic recession (Q4/2010 – Q1/2012), and the COVID-19 pandemic (Q2/2020 – Q2/2022). All other quarters are coded as 0.

3. 2. PRIOR SETTING

This study adopts the natural conjugate prior, which is suitable in the context of small open economies such as Vietnam. This prior allows the error covariance matrix (Σ) to take a general form and facilitates statistical inference due to its conjugate properties. Additionally, this structure can be easily adjusted to stricter forms like the Minnesota prior or more flexible forms like the independent normal-Wishart prior (Chan, 2022). We employ aggregated macroeconomic time series for Vietnamese, which exhibit high persistence (e.g., real GDP growth and CPI inflation). Therefore, the prior mean of autoregressive coefficients is set to 0.9, while all other coefficients are centered at zero (Karlsson, 2013; Litterman, 1980, 1986).

3. 3. DYNAMIC MULTIPLIER ANALYSIS AND SHOCK IDENTIFICATION

According to Lütkepohl (2005), a stable VAR system with exogenous variables can be represented in the following form:

$$y_t = \sum_{j=0}^{\infty} D_j x_{t-j} + \sum_{j=0}^{\infty} \Phi_j u_{t-j} \quad (2)$$

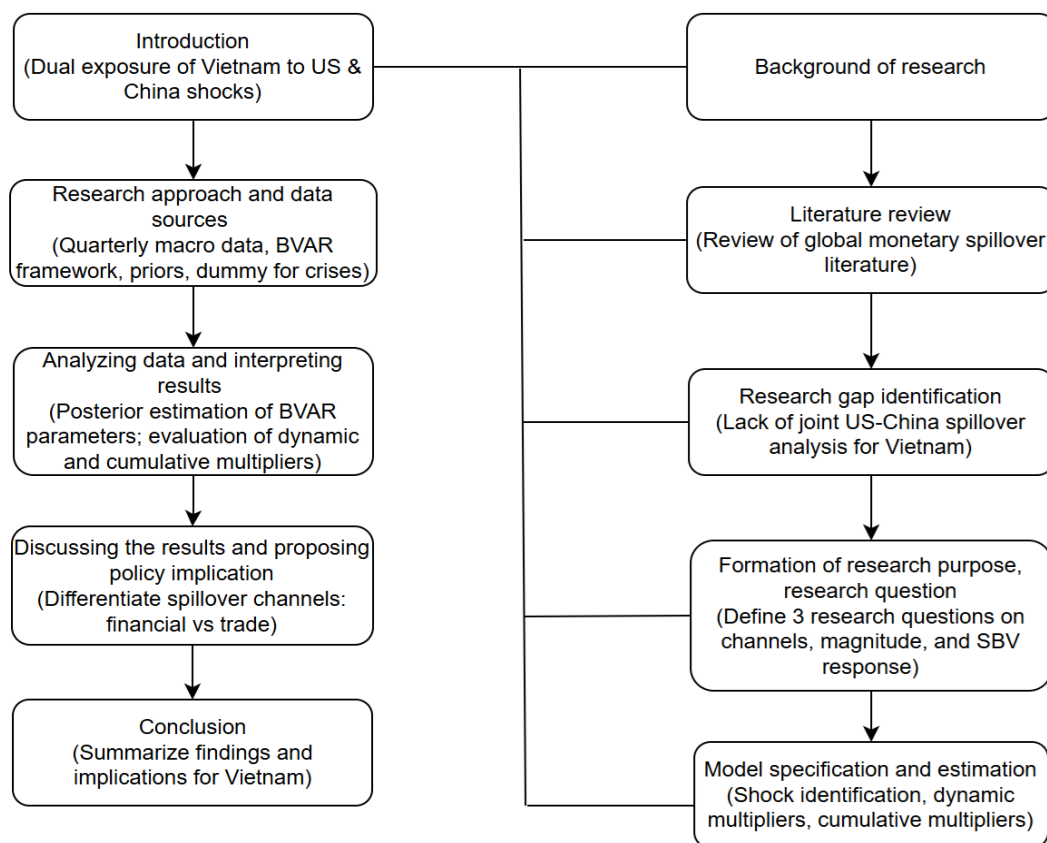
Where Φ_j is the matrix containing the impulse response functions, and D_j is the matrix containing the dynamic multipliers. The impulse response function allows for the analysis of how an

endogenous variable reacts to shocks originating from other endogenous variables within the system. In contrast, the dynamic multipliers and cumulative dynamic multipliers are used to analyze the response of endogenous variables to a one-unit change in an exogenous variable. The dynamic multipliers $\hat{D}_i$ are consistently estimated using OLS estimation of the parameters of the reduced VAR model. Then, the cumulative dynamic multipliers can be determined using the following formula (Lütkepohl, 2005):

$$CD_i = \sum_{j=0}^i \hat{D}_j \quad (3)$$

This study assesses the responses of endogenous variables to monetary policy shocks from the U.S. and China through the analysis of dynamic multipliers and cumulative dynamic multipliers. In this framework, the U.S. federal funds rate and China's 1-year benchmark lending rate are modeled as exogenous variables, under the assumption that they are not contemporaneously affected by Vietnam's economic variables in the short run. Each policy shock is simulated as a sudden 1 percentage point increase in the initial quarter ($t = 0$).

Figure 1. Integrated research design and empirical strategy



Source: Author

The flowchart presents the sequential stages of the study: from defining Vietnam's dual exposure to U.S. and Chinese monetary shocks, reviewing the theoretical and empirical literature, identifying research gaps, and formulating precise research questions, to specifying and estimating a BVAR model, analyzing dynamic and cumulative multipliers, and deriving targeted policy recommendations. By combining deductive reasoning (literature review and hypothesis development) with rigorous empirical estimation via Bayesian inference and subsequent multiplier analysis, this framework ensures methodological transparency and internal coherence throughout the research process.

4. DATA AND EMPIRICAL RESULTS

4. 1. DATA AND VARIABLES

The research uses quarterly time-series data spanning from Q1/2005 to Q4/2024 (80 observations), which include endogenous variables for Vietnam's economy and exogenous variables for the monetary policy of the U.S. and China.

The set of endogenous variables comprises real GDP growth (*gdp_vn*), inflation rate (*cpi_vn*), real exchange rate growth (*ex_vn*), current account balance (*ca_vn*), financial account balance (*fa_vn*), and the SBV's refinancing rate (*irr_vn*). The variables *gdp_vn*, *cpi_vn*, and *ex_vn* are measured as year-on-year growth rates, while *irr_vn* is reported in nominal terms and is not seasonally adjusted, as it is a policy-administered rate set by the SBV in response to macroeconomic developments and policy objectives. Real GDP is a fundamental macroeconomic indicator that reflects the size and overall health of the economy after adjusting for inflation. It is widely used in empirical models analyzing monetary transmission, particularly within the Mundell–Fleming framework. The use of year-on-year growth rates (%YoY), rather than absolute levels, enhances comparability over time, mitigates the effects of cyclical fluctuations and seasonal variations, and preserves long-run informational content for BVAR analysis. The current account balance and financial account balance are normalized as percentages of GDP to eliminate scale effects due to the size of the economy, to reduce the noise arising from exchange rate and inflation volatility, to mitigate the long-term co-movement with GDP, and to control for seasonal fluctuations. The exogenous variables include the U.S. federal funds rate (*irr_us*), China's 1-year benchmark lending rate (*irr_cn*), and a crisis dummy variable.

The data is sourced from reputable institutions, including the General Statistics Office of Vietnam (GSO), the International Financial Statistics (IFS) database of the IMF, and the Asian Development Bank's Economic and Financial Indicators (EFI). Detailed descriptions of variable names, definitions, measurement units, and data sources are presented in Table 1.

Table 1. Description of Variables Used in the Empirical Analysis

Variable Name	Description	Unit of Measurement	Data Source	Access Date
<i>gdp_vn</i>	Real GDP growth compared to the same quarter of the previous year	%YoY	https://www.gso.gov.vn (GSO, 2025)	04/02/2025
<i>cpi_vn</i>	Year-on-year change in the Consumer Price Index (CPI)	%YoY	https://www.gso.gov.vn (GSO, 2025)	04/02/2025
<i>ex_vn</i>	Year-on-year change in the real exchange rate (VND/USD), adjusted for inflation	%YoY	https://legacydata.imf.org (IMF, 2025)	05/02/2025
<i>ca_vn</i>	Current account balance as a share of nominal GDP	% GDP	https://aric.adb.org (ADB, 2025)	06/02/2025
<i>fa_vn</i>	Financial account balance as a share of nominal GDP	% GDP	https://aric.adb.org (ADB, 2025)	06/02/2025
<i>irr_vn</i>	Refinancing interest rate of the SBV	%/year	https://legacydata.imf.org (IMF, 2025)	05/02/2025
<i>irr_us</i>	U.S. federal funds rate	%/year	https://legacydata.imf.org (IMF, 2025)	05/02/2025
<i>irr_cn</i>	China's one-year benchmark lending rate	%/year	https://legacydata.imf.org (IMF, 2025)	05/02/2025
<i>crisis</i>	Crisis dummy variable: 1 = within global crisis periods; 0 = otherwise	Binary (0/1)	Constructed based on the timing of major global crisis events	Defined by a crisis timeline

Source: Author's calculation

Table 2 presents summary statistics. Vietnam's average GDP growth remained strong at 6.134% while inflation exhibited significant volatility, with a standard deviation of 5.751%, and peaked at nearly 28% in Q3/2008. The real exchange rate underwent substantial fluctuations due to two

notable depreciation episodes in 2011 and 2022. The external balances exhibit wide-ranging variations, indicating significant external exposure. The policy rates reflect divergent monetary conditions and institutional frameworks across countries.

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
gdp_vn	80	6.134	2.187	-6.170	13.670
ex_vn	80	-1.376	4.362	-16.060	5.773
cpi_vn	80	6.534	5.751	0.297	27.900
ca_vn	80	0.235	7.632	-38.834	15.761
fa_vn	80	5.930	8.232	-10.308	40.439
irr_vn	80	6.866	2.718	4.000	15.000
irr_us	80	1.723	1.972	0.125	5.375
irr_cn	80	5.223	0.957	4.350	7.470
Crisis	80	0.275	0.449	0	1

Source: Author's calculation

4. 2. STATIONARITY TESTS

The study applies the Augmented Dickey-Fuller (ADF) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to assess the stationarity of the variables used in the model. The results of the stationarity tests are reported in Table 3.

Table 3. Stationarity tests

Variables	Original		Controlled for crisis	
	ADF	KPSS	ADF	KPSS
gdp_vn	-2.737***	0.297	-2.746***	0.462
ex_vn	-2.641***	0.746***	-2.437**	0.757
cpi_vn	-1.819**	0.707***	-1.796*	0.825
ca_vn	-1.750**	0.505**	-1.961*	0.538
fa_vn	-2.572***	0.482**	-2.658***	0.498
irr_vn	-2.004**	0.502**	-1.821*	0.530
Critical values				
10%	-1.296	0.355	-1.610	1.111
5%	-1.670	0.439	-1.950	1.438
1%	-2.389	0.550	-2.612	2.118

Source: Author's calculation

In the baseline model without controlling for the crisis dummy, the ADF test rejects the null hypothesis of a unit root at the 1% significance level for three series: gdp_vn, ex_vn, and fa_vn. For the remaining series (cpi_vn, ca_vn, and irr_vn), the null hypothesis is rejected at the 5% level. These results suggest that all series appear stationary based on the ADF criterion. However, the KPSS test produces results that are not entirely consistent with those of the ADF test. Except for the gdp_vn series, which has a test statistic of 0.297, lower than the critical values at the 10%, 5%, and 1% levels, all other series exhibit test statistics exceeding the corresponding thresholds. That leads to the rejection of the null hypothesis of stationarity, indicating the likely presence of a unit root.

The inconsistency between the two tests suggests that exogenous shocks may have distorted the statistical properties of the series during specific periods, particularly during episodes of global economic turbulence such as the 2007-2008 financial crisis, the 2010-2012 global downturn, and the 2020-2022 COVID-19 pandemic. To account for the impact of these exceptional events,

the study introduces a crisis dummy variable into the model and re-applies the KPSS test after adjusting for this variable. The post-adjustment results indicate that all series have KPSS test statistics below the critical values at the 10%, 5%, and 1% significance levels, implying that the null hypothesis of stationarity cannot be rejected. This finding suggests that, once crisis-related shocks are accounted for, all endogenous variables in the model satisfy the stationarity condition. Therefore, the study has sufficient grounds to include the variables in the BVAR model in levels without differencing, thereby preserving the information on long-run relationships among the variables. The crisis dummy variable is retained in the model as an exogenous regressor to capture irregular, non-recurring disturbances over the sample period.

4.3. LAG LENGTH SELECTION

In this study, lag selection is conducted using a Bayesian approach, based on posterior model probabilities obtained from the estimation of the log-marginal likelihood ($\log(\text{ML})$). The results of lag length selection are reported in Table 4. The log-marginal probability is computed using the Laplace–Metropolis approximation, a widely used technique in BVAR estimation proposed by Sims et al. (Sims et al., 2008).

Table 4. Lag selection

	$\log(\text{ML})$	P(M)	P(My)
lag1	-1.37E+03	0.250	1.000
lag2	-1.38E+03	0.250	0.000
lag3	-1.38E+03	0.250	0.000
lag4	-1.38E+03	0.250	0.000

Source: Author's calculation

As shown in Table 4, the model with lag length equal to 1 ($\text{lag} = 1$) achieves the highest log-marginal likelihood value, corresponding to a posterior model probability of $P(\text{My}) = 1.000$. In contrast, models with lag lengths from 2 to 4 yield lower log-marginal likelihood values and posterior probabilities of zero. The optimal lag order is $p = 1$.

4.4. STABILITY CONDITION OF THE MODEL

The study conducted an eigenvalue analysis of the state transition matrix at each MCMC iteration to assess whether all eigenvalues lie within the unit circle, thereby verifying the stability condition of the system. The results are summarized in Table 5.

Table 5. Stability condition

Eigenvalue stability condition			Companion matrix size		=	6
			MCMC sample size		=	1000
Eigenvalue modulus	Mean	Std. dev.	MCSE	Median	Equal-tailed	
					[95% cred.	interval]
1	0.625	0.068	0.002	0.623	0.501	0.777
2	0.550	0.080	0.003	0.556	0.394	0.689
3	0.393	0.074	0.002	0.390	0.258	0.535
4	0.255	0.077	0.002	0.255	0.116	0.407
5	0.119	0.053	0.002	0.116	0.029	0.232
6	0.054	0.037	0.001	0.048	0.003	0.141

Source: Author's calculation

Table 5 shows that all six eigenvalues (corresponding to the size of the companion state transition matrix) had average moduli ranging from 0.054 to 0.625, which is below the threshold of 1

across all simulation steps. Additionally, the posterior probability that all eigenvalues lie within the unit circle was equal to 1.000, confirming the stability of the BVAR model employed.

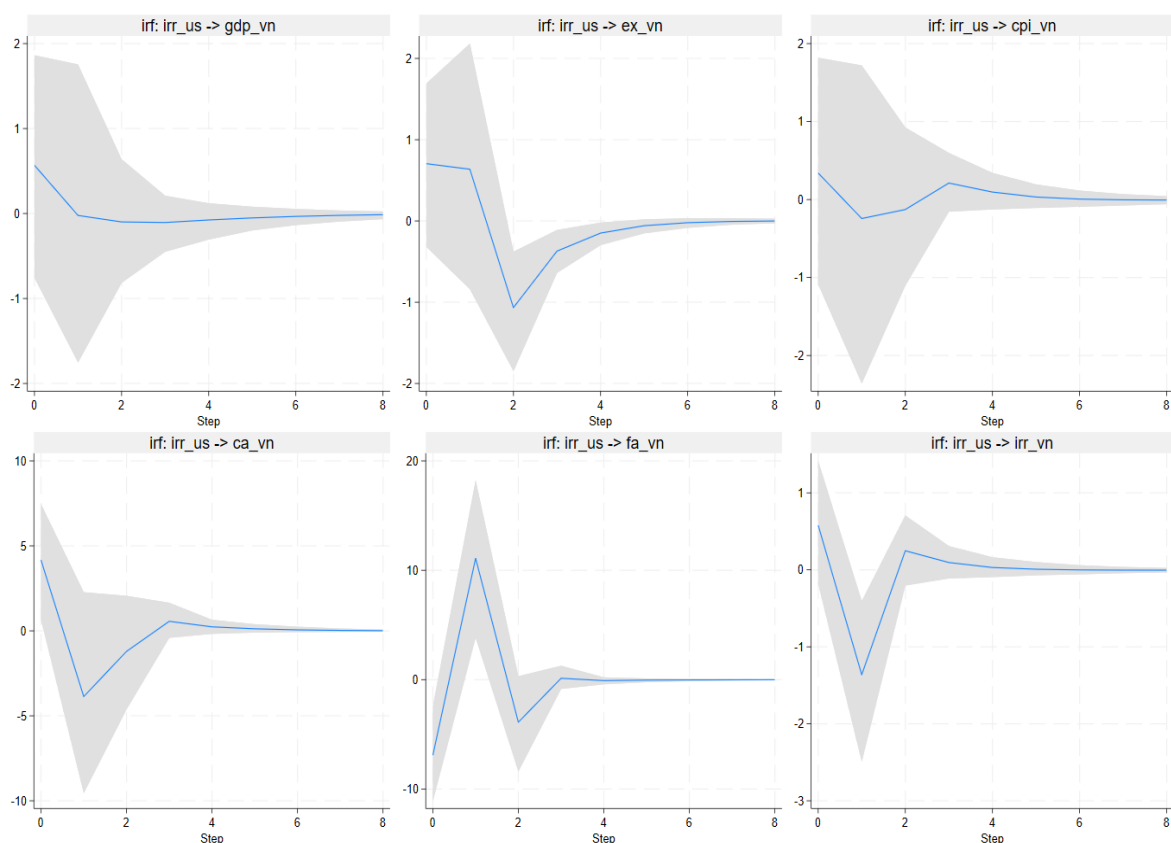
4. 5. EMPIRICAL RESULTS

The dynamic multipliers for U.S. and Chinese monetary policy shocks are illustrated in Figures 2 and 3, respectively. The blue lines indicate the mean dynamic multipliers, while the shaded gray areas represent the 95% credible intervals. In addition, Tables 6 and 7 present the model estimates for all target variables and illustrate how Vietnam's macroeconomic indicators respond to monetary policy shocks originating from the U.S. and China.

4. 5. 1. RESPONSE TO U.S. MONETARY POLICY SHOCKS

The data presented in Figure 2 and Table 6 indicate that Vietnam's real GDP growth shows a mild positive reaction immediately following a U.S. monetary tightening shock, with an increase of approximately 0.568%. The response subsequently turns negative, reaching its lowest point at -0.106% in the third quarter. The growth rate gradually recovers and converges toward its pre-shock level after roughly 6 to 8 quarters. The inflation rate initially exhibits a positive response (around 0.34%), but declines within the initial quarter and remains relatively stable in the subsequent periods.

Figure 2. Response to U.S. monetary policy shocks



Source: Author's calculation

Table 6. Response of variables to irr_us impulse

	(1)	(2)	(3)	(4)	(5)	(6)
Step	gdp_vn	ex_vn	cpi_vn	ca_vn	fa_vn	irr_vn
0	0.568	0.705	0.340	4.173	-6.914	0.581
1	-0.023	0.637	-0.243	-3.867	11.093	-1.362
2	-0.099	-1.067	-0.128	-1.211	-3.888	0.248
3	-0.106	-0.371	0.211	0.561	0.126	0.095
4	-0.076	-0.149	0.096	0.237	-0.088	0.030
5	-0.052	-0.058	0.033	0.122	-0.041	0.008
6	-0.034	-0.021	0.006	0.057	-0.024	-0.001
7	-0.022	-0.006	-0.004	0.026	-0.012	-0.004
8	-0.014	0.000	-0.006	0.010	-0.006	-0.004

Source: Author's calculation

Nonetheless, the responses of both GDP and inflation remain within the 95% credible intervals that encompass zero across most horizons, which implies no statistically significant impact of U.S. monetary policy shocks in the short to medium term. These findings are consistent with previous studies. Georgiadis observed that in highly open economies, the depreciation of the domestic currency acts as a natural shock absorber against U.S. interest rate hikes (Georgiadis, 2016). Similarly, Beirne, Renzhi, and Volz found that U.S. monetary shocks have negligible effects on GDP in emerging Asian economies (Beirne et al., 2023).

The real exchange rate initially exhibits a mild increase of 0.705% at the moment of the shock. It suggests a weakening of the VND relative to the U.S. dollar. However, the exchange rate quickly reverses direction in the second quarter, registering a decline of 1.067%, and gradually returns to equilibrium over approximately six quarters. This V-shaped response reflects the typical short-run adjustment pattern of Vietnam's foreign exchange market. It also highlights the effectiveness of the SBV's managed exchange rate regime in maintaining exchange rate stability (IMF, 2024).

The current account shows a sharp and immediate positive response following the U.S. monetary tightening shock, with an increase of 4.173% of GDP. This outcome reflects the exchange rate adjustment mechanism, whereby the relative depreciation of the VND enhances the international competitiveness of Vietnamese exports. It is a textbook manifestation of the expenditure switching effect, in which a weaker domestic currency boosts exports and curtails imports in the short term, thereby improving the current account balance (Georgiadis, 2016).

However, this positive effect does not persist over the long run. The current account response declines rapidly after this point and falls within the confidence bands that include zero for most subsequent periods, indicating no statistically significant evidence of long-term effects. This outcome reflects structural limitations in Vietnam's trade system, which is characterized by a high reliance on imported inputs and a low level of domestic value-added. The research conducted by Diep et al. reveals that the FDI sector accounts for up to 70% of Vietnam's export turnover, while only 4% of domestic firms have the capacity to participate in global value chains (Diep et al., 2024). The findings suggest that exchange rate depreciation acts as a short-term shock absorber, but the structural characteristics of the Vietnamese economy prevent it from effectively handling external shocks over the medium to long term. The economy needs fundamental structural reforms to achieve sustainable current account improvement through the development of domestic value chains, diversification of export markets, and enhancement of localization capacity.

Vietnam's financial account exhibits a strong and volatile reaction after the U.S. monetary tightening shock. In the first quarter after the shock, a sudden capital outflow led to a sharp

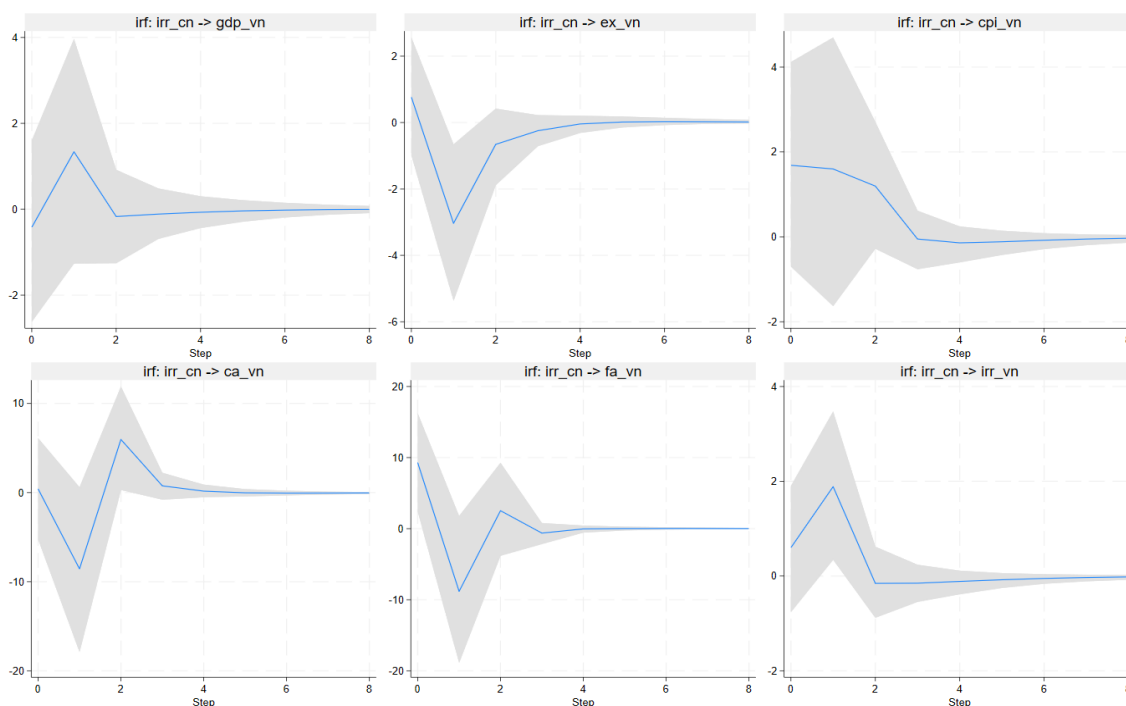
decline in the financial account by 6.914% of GDP. That reflects a typical short-term reaction of portfolio capital flows to shifts in U.S. monetary policy. Notably, the financial account reverses course within the same quarter, reaching 11.093% of GDP before gradually stabilizing over the subsequent quarters. This pattern is a sudden stop phenomenon, which is common in financially liberalizing economies with weak macroeconomic fundamentals (Georgiadis, 2016). However, the magnitude and rapid reversal of these capital flow fluctuations also suggest the presence of domestic policy interventions. Ha, Liu, and Rogers emphasize that capital flow management and proactive foreign exchange interventions are essential tools in mitigating global financial contagion (Ha et al., 2023). In Vietnam's case, the financial system reacts strongly to the initial external shock, but the overall macroeconomic framework maintains a degree of medium-term stability.

The SBV responded promptly to the U.S. monetary shock by adjusting the refinancing rate. In the first quarter, the policy rate was raised by 0.581 percentage points to maintain market stability and curb VND depreciation. However, it was decreased by 1.362 percentage points in the subsequent quarter. That reflects the SBV's flexible policy stance, which aimed to support economic growth once external pressures subsided. This pattern is consistent with findings by Ha et al., who showed that emerging and developing economies with capital controls and active foreign exchange interventions tend to exhibit weaker and shorter-lived interest rate and exchange rate responses to U.S. rate hikes (Ha et al., 2023). Pham and Nguyen support this finding by showing that Asian developing countries with exchange rate pegs and high trade openness adjust their policy rates more quickly in response to shifts in U.S. monetary policy (Pham and Nguyen, 2019).

4.5.2. RESPONSE TO CHINESE MONETARY POLICY SHOCKS

Empirical evidence from Figure 3 and Table 7 indicates that Vietnam's real GDP growth exhibits a short-term adjustment pattern in response to the Chinese monetary tightening shock, but this response is not statistically significant. The GDP growth rate declines marginally by 0.412% at the time of the shock, followed by a notable rebound of 1.338% in the subsequent quarter before stabilizing.

Figure 3. Response to Chinese monetary policy shocks



Source: Author's calculation

Table 7. Response of variables to irr_cn impulse

	(1)	(2)	(3)	(4)	(5)	(6)
Step	gdp_vn	ex_vn	cpi_vn	ca_vn	fa_vn	irr_vn
0	-0.421	0.768	1.687	0.419	9.299	0.599
1	1.338	-3.035	1.599	-8.562	-8.824	1.887
2	-0.169	-0.658	1.197	5.963	2.529	-0.154
3	-0.113	-0.246	-0.051	0.758	-0.624	-0.151
4	-0.069	-0.043	-0.140	0.164	-0.031	-0.113
5	-0.038	0.016	-0.115	-0.025	0.015	-0.078
6	-0.020	0.027	-0.079	-0.055	0.027	-0.050
7	-0.010	0.023	-0.051	-0.048	0.021	-0.031
8	-0.005	0.016	-0.032	-0.034	0.015	-0.018

Source: Author's calculation

The real exchange rate increased by 0.768% at the time of the shock but declined sharply by 3.035% in the following quarter before gradually stabilizing. This initial fluctuation was driven by the PBoC raising its policy rates, which heightened yield expectations for RMB-denominated assets. As a result, the upward momentum of the USD/VND exchange rate temporarily weakened through the interest rate expectations channel. However, this effect quickly dissipated, indicating that Vietnam's managed exchange rate regime plays a crucial role in maintaining exchange rate stability. These findings are consistent with those of Beirne, Renzhi, and Volz, who observed that exchange rate movements in emerging Asian economies tend to respond only briefly to monetary policy shocks from the PBoC (Beirne et al., 2023).

The monetary tightening shock from China has a significant impact on inflation in Vietnam. The inflation rate increases by 1.687% in the quarter of the shock and continues to rise by 1.599% and 1.197% over the following two quarters. This dynamic reflects the exchange rate pass-through effect, with higher import prices resulting from the appreciation of the Chinese renminbi and Vietnam's structural trade deficit with China. However, the inflationary pressure diminishes quickly thereafter and becomes statistically insignificant in the long term.

This finding differs from the results of Beirne, Renzhi, and Volz, who observed that Chinese monetary tightening typically induces a substantial decline in inflation across emerging Asian economies (Beirne et al., 2023). The discrepancy may be explained by differences in methodology. The scholars applied a region-wide SVAR framework and identified an indirect transmission channel. In their analysis, Chinese monetary tightening reduces global demand, depresses international commodity prices, and thereby lowers import costs across the region. In contrast, Vietnam's inflation response appears to follow a different pattern. It reflects a more direct and short-lived cost-push effect, driven by exchange rate fluctuations and Vietnam's trade dependence on China.

The current account displays a volatile short-term response, initially rising by 0.419% of GDP but then sharply declining by 8.562% within the same quarter. However, the wide credible intervals and estimates that largely encompass zero suggest that the response is not statistically significant over the post-shock horizon. Similarly, the financial account surges by 9.299% of GDP immediately after the Chinese shock and then falls by 8.824% within the same quarter. As with the current account, these large fluctuations are not statistically significant, despite their considerable magnitude.

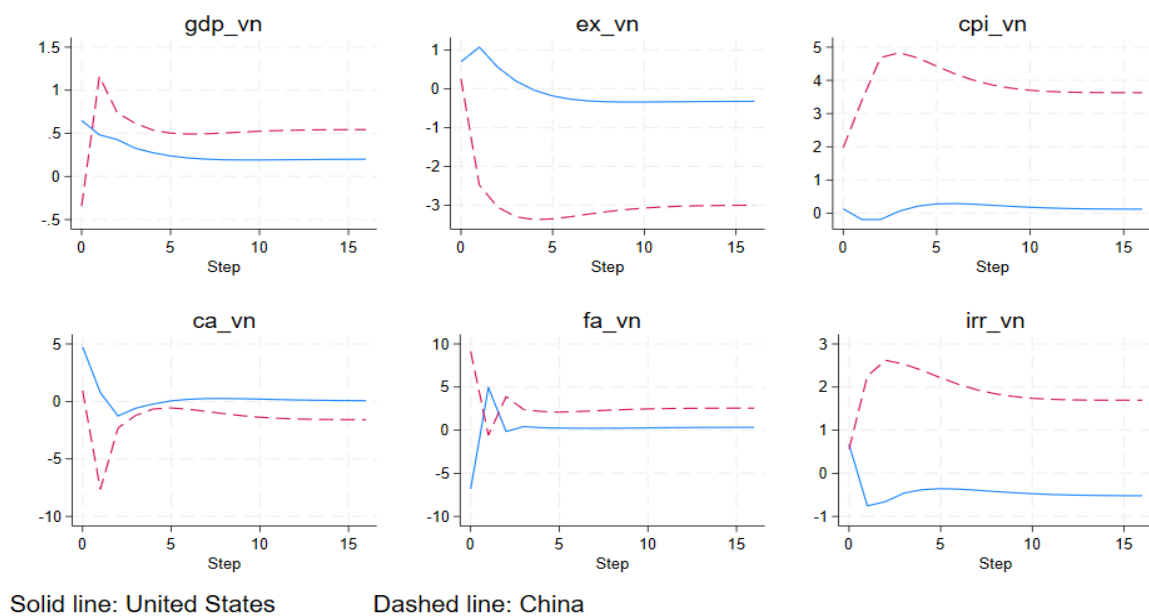
The SBV's policy response is notably more pronounced in the wake of the Chinese monetary shock. The refinancing rate rises by 0.599% in the quarter when the shock occurs, followed by a more substantial increase of 1.997% in the first post-shock quarter. It stands in contrast to the

SBV's response to U.S. monetary shocks. The asymmetry may stem from Vietnam's trade deficit with China, where rising costs of imported inputs resulting from RMB appreciation are not offset by a corresponding increase in export growth. As a result, the SBV raises interest rates to support the currency and control inflation. However, this policy stance is only temporary, as the weakening of regional demand caused by Chinese tightening eventually leads the SBV to reverse course and ease rates to stimulate domestic growth. These findings are in line with those of Beirne, Renzhi, and Volz, who documented shifts in monetary responses and exchange rate movements following PBoC shocks (Beirne et al., 2023).

4. 5. 3. COMPARATIVE IMPACTS OF U.S. AND CHINESE MONETARY POLICY SHOCKS ON VIETNAM

The cumulative dynamic multiplier analysis, as illustrated in Figure 4, allows for a comprehensive comparison of the magnitude and transmission mechanisms of monetary policy shocks from the U.S. (solid lines) and China (dashed lines) in the Vietnamese economy.

Figure 4. Comparative impacts of U.S. and Chinese monetary policy shocks on Vietnam



Source: Author's calculation

Both shocks produce short-term positive effects on Vietnam's real GDP growth, with the impact of China's monetary policy appearing stronger during the early quarters and the medium term. However, the 95% credible intervals include zero in both cases, suggesting that the effects on GDP are not statistically significant and primarily reflect short-term adjustments rather than sustained macroeconomic effects.

Exchange rate responses exhibit substantial differences in both direction and magnitude. Monetary shocks from the U.S. generate temporary depreciation pressure on the VND, while Chinese shocks result in a more pronounced and persistent appreciation. This pattern underscores China's dominant role in Vietnam's trade structure and its influence on regional price expectations. Regarding inflation, only the Chinese shock generates a statistically significant response, confirming that the imported inflation channel is the primary transmission mechanism. The current account shows a brief surplus following the U.S. shock, which quickly narrows and stabilizes, whereas the Chinese shock induces a sharp and prolonged deficit. The financial account also responds with considerable volatility; however, these responses are not statistically significant,

highlighting the fragile and reversible nature of short-term capital flows.

The SBV's monetary policy reaction is more pronounced in response to the Chinese shock, reflecting a proactive stance aimed at containing imported inflation driven by renminbi appreciation. In contrast, the SBV adopts a more flexible and short-term approach to U.S. shocks, with an emphasis on maintaining financial stability and supporting economic growth through accommodative interest rate adjustments.

4. 6. ROBUSTNESS CHECK

4. 6. 1. ROBUSTNESS CHECK USING THE INDEPENDENT NORMAL-WISHART PRIOR

To test the model's sensitivity to the choice of priors, the study relaxes the assumption of the natural conjugate prior by adopting the Independent Normal-Wishart prior. Under this specification, the prior distributions for the coefficient matrix β and the error covariance matrix Σ are assumed to be independent, rather than assuming that the variance of β is conditional on Σ , as in the standard Normal-Wishart prior. In this robustness test, the own-variable tightness, cross-variable tightness, lag decay, and exogenous variable tightness parameters are set to 0.1, 0.5, 1, and 100, respectively.

4. 6. 2. ROBUSTNESS CHECK USING THE ORIGINAL MINNESOTA PRIOR

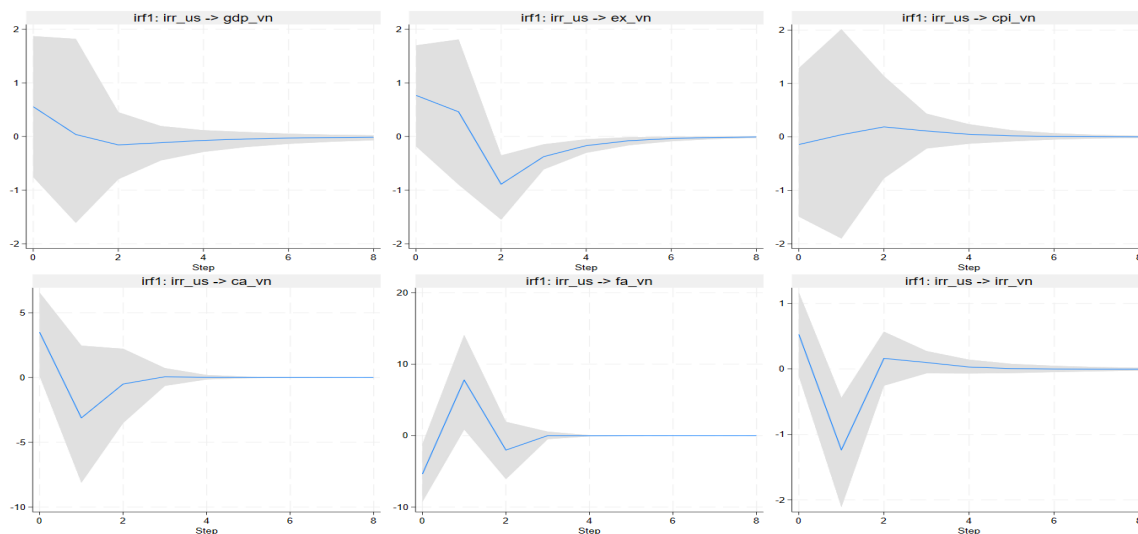
The second robustness check tightens the prior by employing the Original Minnesota prior (Litterman, 1980, 1986). In this setting, the matrix Σ is assumed to be known and diagonal, meaning that no prior distribution is imposed on Σ . The diagonal elements of Σ are estimated as the variances of the error terms associated with endogenous shocks. The prior distribution for β is configured similarly to that in the first robustness check.

4. 6. 3. ROBUSTNESS CHECK USING SEASONALLY ADJUSTED DATA

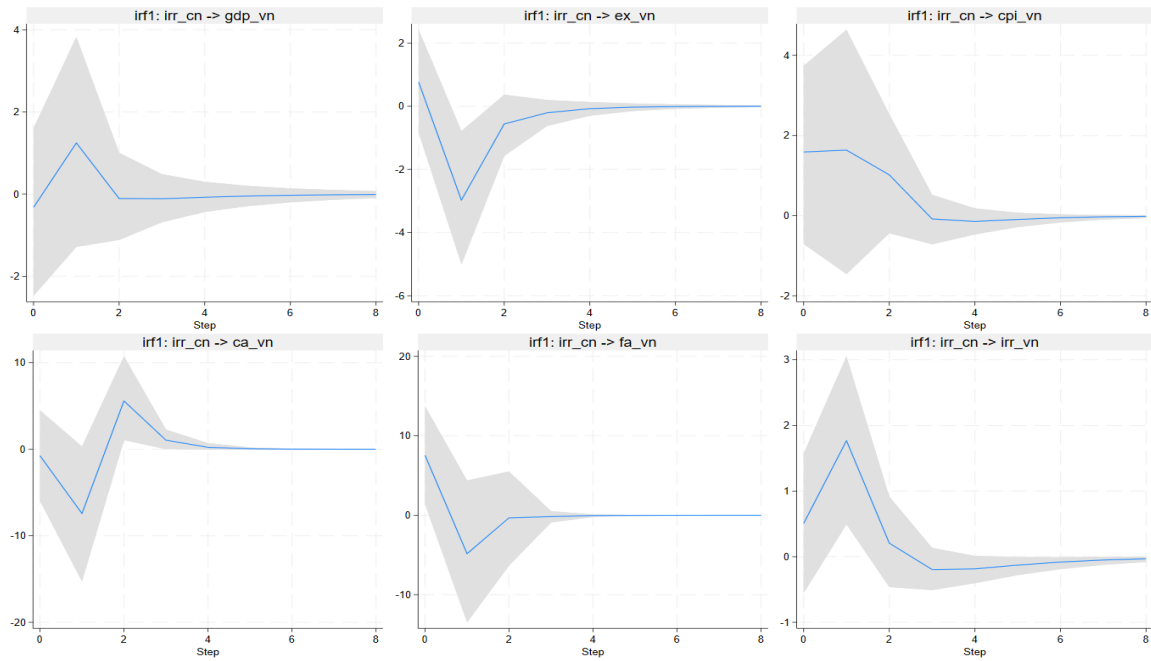
In the third robustness check, the study applies seasonal adjustment to the current account and financial account variables using the Census X-13 method developed by the U.S. Census Bureau. Based on regression techniques involving ARIMA processes, the X-13 procedure decomposes time series into components such as seasonal patterns and long-term trends. Seasonal adjustment is performed using EViews 13 software.

Figures 5, 6, and 7 present the dynamic multiplier under these specifications.

Figure 5. Robustness check under Independent Normal-Wishart Prior

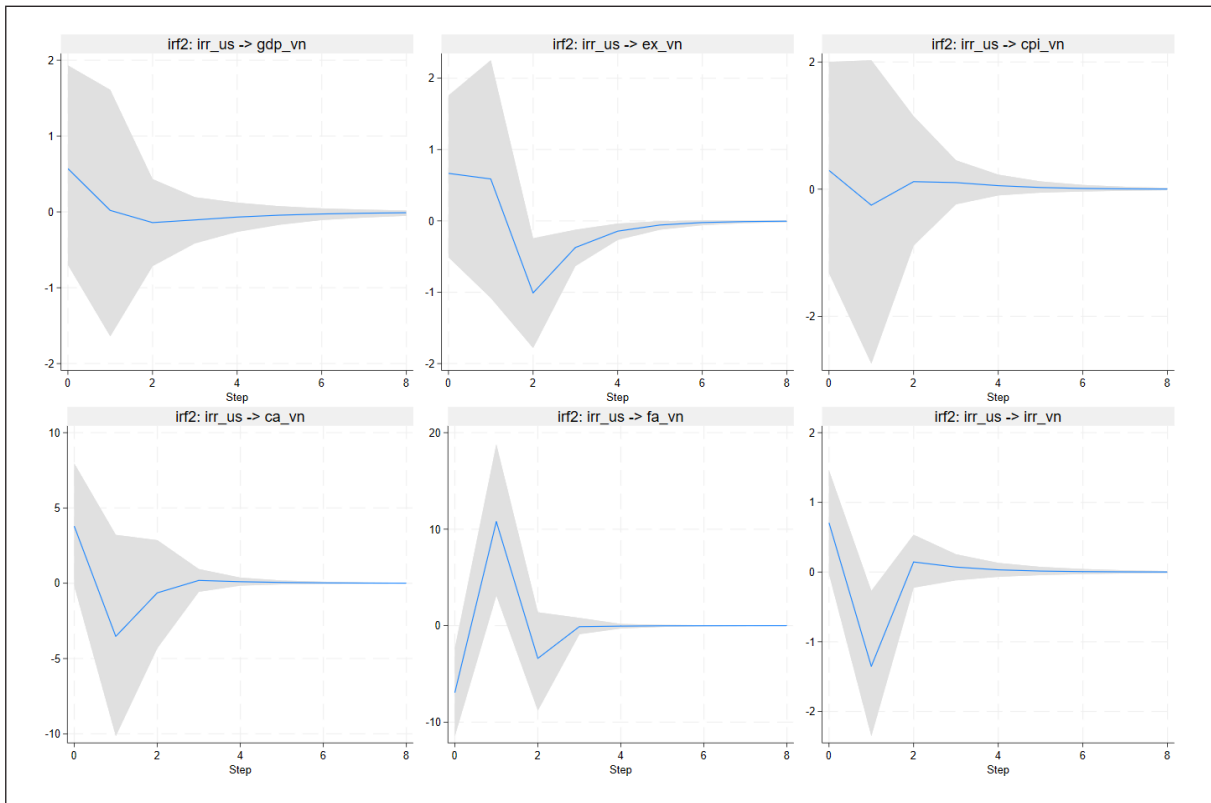


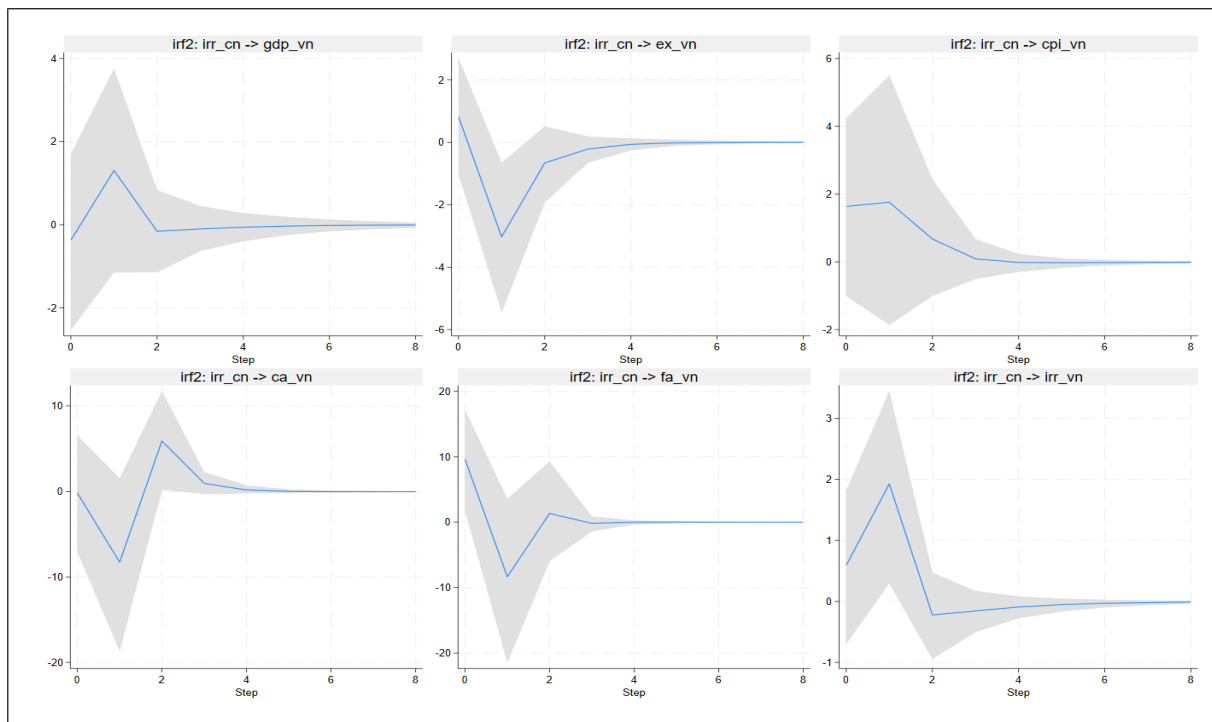
Source: Author's calculation



Source: Author's calculation

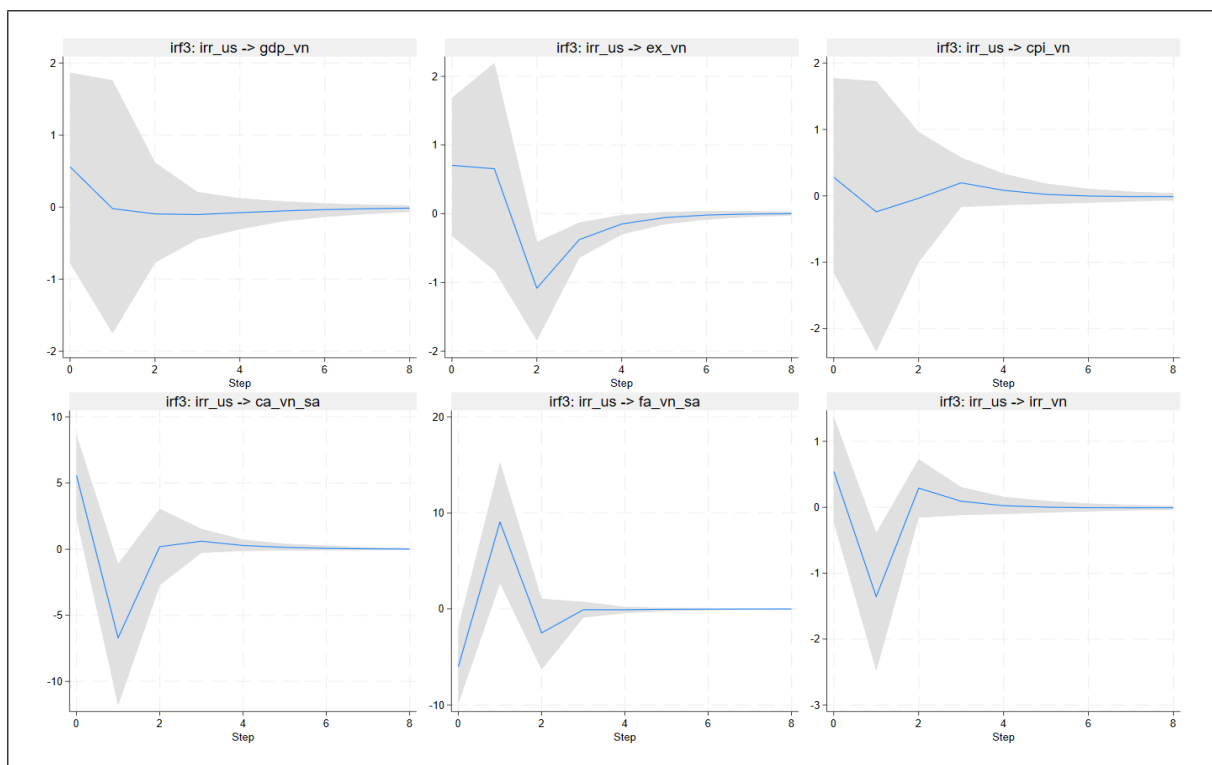
Figure 6. Robustness check under Original Minnesota Prior

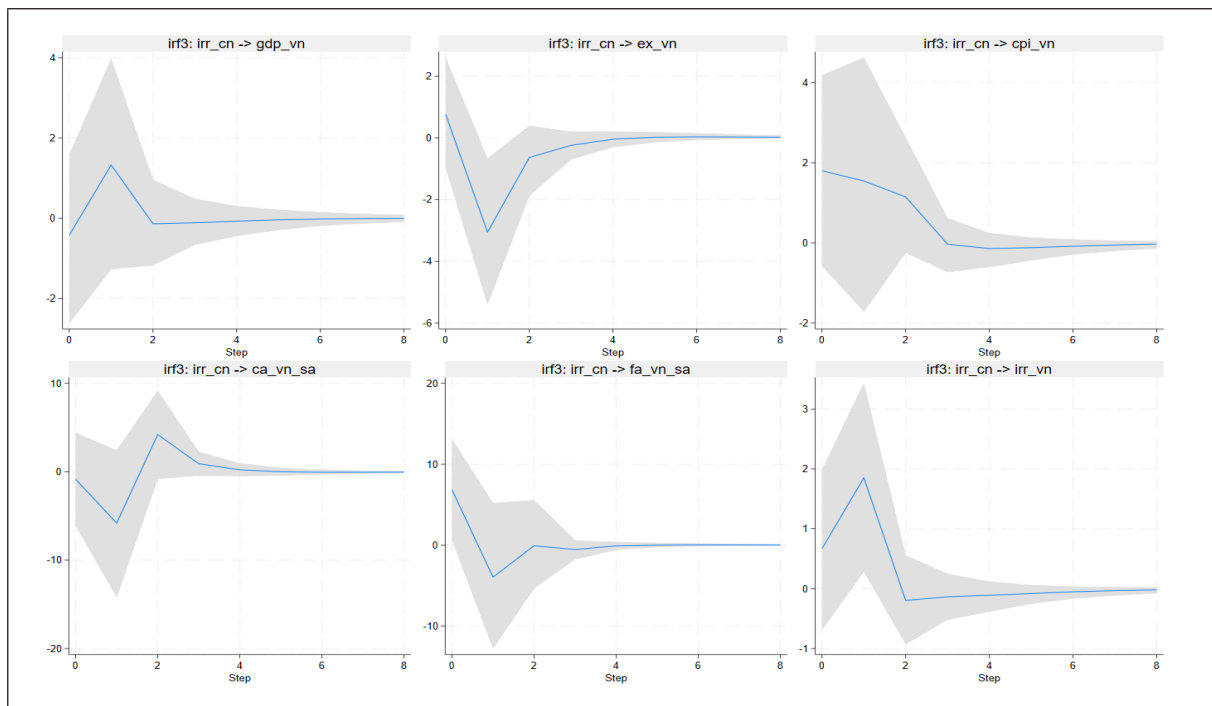




Source: Author's calculation

Figure 7. Robustness check of the baseline model under seasonally adjusted data





Source: Author's calculation

4. 6. 4. SYNTHESIS OF ROBUSTNESS RESULTS

All three robustness checks demonstrate that the structure, direction, magnitude, and timing of monetary policy shock transmissions originating from both the U.S. and China remain broadly consistent across all robustness models. The imported inflation channel associated with Chinese monetary policy continues to be the most stable and statistically significant transmission mechanism, regardless of changes to prior assumptions or seasonal adjustments of the data.

Spillover effects from U.S. monetary policy remain concentrated in the exchange rate and the short-term capital flow channels, but do not exhibit a statistically significant impact on inflation or GDP growth in Vietnam. Overall, the robustness checks confirm that the baseline BVAR model is highly stable, with results driven primarily by empirical data rather than by restrictive technical priors. It reinforces the credibility and policy relevance of the empirical findings derived from the model.

5. DISCUSSION

The transmission of U.S. monetary policy to Vietnam conforms to the classic Mundell–Fleming framework. In particular, increases in the Fed's policy rate induce capital outflows and depreciation of the VND, with the exchange rate responding almost immediately, highlighting the dominant role of financial transmission channels (Georgiadis, 2016; Miranda-Agrippino & Rey, 2020). However, the presence of capital controls and a managed exchange rate regime mitigates the extent of these spillover effects.

In contrast to prior studies that report significant impacts on output and inflation (Albrizio et al., 2020; Arbatli-Saxegaard et al., 2022; Kalemli-Özcan, 2019; Miranda-Agrippino & Rey, 2020; Pham & Nguyen, 2019), our findings suggest that neither GDP nor the CPI in Vietnam reacts strongly to U.S. monetary shocks. Three main reasons can explain it:

1. The transmission from monetary policy to real economic activity typically operates with a lag, especially in economies characterized by limited financial development and overlapping policy instruments. In Vietnam, interest rate changes affect credit and lending quickly, but the pass-through to prices and output is often weak and inconsistent (Díez et al., 2024);

2. Vietnam's economy relies heavily on domestic consumption, which accounted for 63.16% of GDP in 2023 (GSO, 2024);
3. Vietnam has a tradition of using administered prices and subsidies to contain inflation, particularly in essential sectors such as energy, food, and healthcare. As a result, part of the external shock is absorbed before it reaches consumers and aggregate demand. In contrast, monetary shocks from China have stronger and more lasting effects on Vietnam's inflation due to deep trade ties, particularly in intermediate goods like machinery. When the PBoC raises its policy rate, RMB appreciation increases input costs, leading to a sharp CPI rise and adverse shifts in exchange rate expectations. These findings align with Beirne, Renzhi, and Volz, who suggest that China's monetary policy may exert stronger regional spillover than that of the U.S. (Beirne et al., 2023).

The SBV exhibits a more pronounced monetary policy response following monetary tightening in China. This pattern suggests that, given Vietnam's deep trade integration with China, the SBV adopts a more proactive and preemptive stance to mitigate the risk of imported inflation resulting from renminbi appreciation. By contrast, in response to U.S. monetary shocks, the SBV pursues a more flexible and short-term approach aimed at maintaining financial stability. That includes timely adjustments of policy rates and foreign exchange market interventions to preserve macroeconomic equilibrium. This pattern has also been emphasized by (Ha et al., 2023).

Based on results, we propose five key recommendations to strengthen Vietnam's resilience to external monetary shocks from major economies such as the U.S. and China:

1. Establish a Macro-Financial surveillance and early warning system to monitor U.S. and China policy shifts. Developing early warning models and conducting sensitivity analyses of the Vietnamese economy to different types of shocks (e.g., capital flows, commodity prices, exchange rates, and trade uncertainty) will improve policy forecasting and responsiveness.
2. Maintain flexibility in monetary operations to respond to external shocks, with instrument choice tailored to the nature of shocks. It will ensure policy effectiveness without destabilizing macroeconomic balances. In particular, in the face of growing trade uncertainty from the U.S., the SBV should maintain adequate foreign exchange reserves and continue to operate a flexible but managed exchange rate regime to avoid abrupt volatility.
3. Promote financial autonomy through the development of the domestic capital market and diversification of trade partners to reduce overdependence on specific economies.
4. Develop supporting industries in key sectors such as electronics, textiles, and machinery by reducing reliance on Chinese intermediate inputs. A well-designed industrial policy includes fiscal incentives, infrastructure, and R&D support, which is essential to increase domestic value-added and shield against cost-push inflation (Diep et al., 2024).
5. Enhance transparency in exchange rate policy, clarifying intervention objectives used in foreign exchange market interventions. Moreover, flexible coordination between monetary and fiscal policy will play a vital role in maintaining macroeconomic stability.

6. CONCLUSION

This study analyzes the spillover effects of U.S. and Chinese monetary policy shocks on Vietnam's macroeconomy using a BVAR framework, highlighting distinct transmission via financial and trade channels.

Monetary shocks from the United States primarily affect Vietnam through the financial channel. A one percentage point increase in the federal funds rate leads to a 0.705% appreciation of real

exchange rate in the impact quarter, a short-term decline of about 6.914% of GDP in the financial account, and a 0.581 percentage point increase in the SBV refinancing rate, while effects on GDP and CPI remain negligible. By contrast, monetary shocks from China exhibit stronger and more persistent spillover effects, mainly transmitted through trade and price channels. Specifically, a one percentage point increase in the PBoC's benchmark lending rate raises Vietnam's CPI by around 1.687% percentage points in the impact quarter, causes the real exchange rate to depreciate by about 3.035% in the following quarter, and worsens the current account by nearly 8.562% of GDP. The SBV responds more swiftly and decisively to Chinese policy shocks, increasing its refinancing rate by about 1.997 percentage points. Neither the U.S. nor Chinese monetary shocks produce significant or lasting effects on Vietnam's GDP growth.

The novelty of the study lies in the integration of both sources of monetary shocks into a single model for the first time, in contrast to the separate treatment commonly adopted in previous research. The proposed analytical framework incorporates structural characteristics of a small, open economy, which improves the generalizability of the findings to other developing economies with deep financial and trade integration.

Theoretically, this study extends the Mundell–Fleming framework through an integrated empirical approach, by providing a new understanding of shock transmission mechanisms that depend on both the source of the shock and the degree of economic openness.

Practically, the research findings recommend continued flexible exchange rate management by the SBV in response to U.S. shocks, and the implementation of targeted industrial policy measures by the Vietnamese government to mitigate cost-push inflation resulting from Chinese shocks. Improved coordination between monetary, fiscal, and structural policies is essential.

The limitations involve the use of proxy variables for monetary policy stances and the omission of external factors such as global commodity price fluctuations and economic policy uncertainty indices due to data constraints.

Future research should integrate more comprehensive measures of monetary policy stances and global macroeconomic conditions to enhance the understanding of vulnerabilities and the formulation of effective policy responses in increasingly complex global monetary environments.

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