

The Impact of Rupiah Exchange Rate Shocks on the Trade Balance and Inflation in Indonesia

Muhammad Arrozi^{1*}, Andre Rahmat Kurniawan², Okza Hendrian Wijaya³, M. Afdhal⁴, Amy Maulid⁵

¹Program Studi Kewirausahaan, Fakultas Seni Rupa dan Desain, Institut Seni Indonesia Padangpanjang

^{2,3,4,5}Fakultas Seni Rupa dan Desain, Institut Seni Indonesia Padangpanjang

ABSTRACT

Exchange rates are one of the macroeconomic instruments that can affect a country's economic stability. Macroeconomic stability, such as inflation and the balance of trade, is highly sensitive to exchange rate dynamics. This study aims to examine the impact of these dynamics/shocks on inflation and Indonesia's trade balance during the period 2023–2026. This study uses secondary data in the form of monthly time series obtained from Statistics Indonesia (BPS) and Bank Indonesia from January 2023 to June 2026. The analytical method used is Structural Vector Autoregression (SVAR). The novelty of this study lies in the time span of the data used from 2023 to June 2026, providing a clear picture of the current dynamics of the Indonesian economy caused by rupiah exchange rate movements. The results of the study indicate that, based on the Impulse Response Function (IRF), in the initial period (period 1), the shock caused by the exchange rate is responded to negatively and significantly by the balance of trade. Meanwhile, the response of the inflation variable in the initial period (periods 1 to 2) is monitored around the equilibrium line with a slight decrease. However, in the 3rd period, the response experiences a significant positive surge, reaching its peak. After this period, the response movement reversed downward into the negative area until the 5th period. This study contributes to adding empirical research on the impact of rupiah exchange rate changes on Indonesia's economic stability, and it is hoped that this research will serve as material for consideration for the Indonesian government in making decisions related to Indonesia's monetary policy

Keywords: Exchange Rate; Balance of Trade; Inflation; SVAR; Indonesia

INTRODUCTION

Currently, the Indonesian economy faces severe challenges due to the persistent depreciation of the rupiah against the US dollar amid geopolitical tensions, conflict between Iran and the United States, elevated global benchmark interest rates, and global economic uncertainty. This continuous currency weakening has the potential to trigger a double shock: first, disrupting trade balance performance through shifts in export-import price competitiveness; second, affecting domestic inflation via the mechanism of imported inflation, which stems from the rising cost of foreign goods and services.

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

^{2*}Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

Persistent exchange rate increases have a direct impact on the aggregate price level. This phenomenon is known as the pass-through effect, referring to the influence of exchange rate fluctuations on overall price levels (Nasir & Vo, 2020). Generally, currency depreciation is widely recognized as a key driver of domestic inflation through this transmission mechanism. When a domestic currency is depreciated, a larger volume of that currency is required to purchase the same quantity of goods or services on international markets. Consequently, imported goods are sold at higher prices in the domestic market, driving up inflation (Monadjemi & Lodewijks, 2021).

Exchange rate pass-through, which is commonly expressed as the percentage change in inflation that results from a one-unit change in the nominal exchange rate, describes how responsive domestic or foreign prices (inflation) are to changes in exchange rates. Understanding the connection between exchange rates, inflation, and commodity prices in this context requires an understanding of Purchasing Power Parity (PPP) theory.

Within the framework of international economic theory, the impact of exchange rate shocks on the trade balance is often explained through the Marshall-Lerner condition and the J-curve phenomenon. The Marshall-Lerner theory provides a clear framework for specific situations where currency depreciation—under either a floating or fixed exchange rate regime—is predicted to improve a country's trade balance (Shubaita & Seraj, 2020). According to this theory, a depreciation of the domestic currency may initially worsen the trade balance in the short run because export and import volumes have not yet fully adjusted, whereas import values dominated by foreign currencies surge immediately (contract currency effect).

Currency depreciation should theoretically enhance the price competitiveness of domestic products in international markets, thereby driving up export volumes and strengthening the trade balance. On the other hand, the economy's current state—still contending with global external pressures and heavy reliance on imported raw materials and capital goods—makes the transmission of rupiah exchange rate shocks highly vulnerable. Rupiah depreciation not only tests the external sector's resilience to global

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id
P-ISSN: 2580-6084, E-ISSN: 2580-8079

commodity price volatility but also triggers dynamic adjustments to the national trade-balance equilibrium in both the short and medium term.

Table 1 presents data on Indonesia's exchange rate, inflation, and trade balance from January 2023 to June 2026. These data are employed to illustrate the country's macroeconomic conditions and the ongoing dynamics of rupiah depreciation.

Table 1: Indonesian Rupiah/USD Exchange Rate Dynamics, Inflation, and Trade Balance (2023–2026)

Year	Exchange Rate (Rupiah)	Inflation (%)	Trade Balance (Million USD)
2023M01	14.979	0.34	3806.2
2023M02	15.274	0.50	5376.8
2023M03	15.062	0.68	2737
2023M04	14.751	1.01	3892.4
2023M05	14.969	1.10	379.1
2023M06	15.026	1.24	3415.9
2023M07	15.083	1.45	1286.3
2023M08	15.239	1.43	3079.7
2023M09	15.526	1.63	3354.5
2023M10	15.916	1.80	3443
2023M11	15.384	2.19	2396.1
2023M12	15.416	2.61	3253.2
2024M01	15.796	0.04	1982.5
2024M02	15.673	0.41	840.9
2024M03	15.853	0.93	4602.2
2024M04	16.249	1.19	2699.7
2024M05	16.253	1.16	2936.8
2024M06	16.421	1.07	2518.9
2024M07	16.320	0.89	671.2
2024M08	15.409	0.87	2755.1
2024M09	15.138	0.74	3176.7
2024M10	15.732	0.82	2711
2024M11	15.864	1.12	4344.4
2024M12	16.162	1.57	2090.2
2025M01	16.259	-0.76	3540.3
2025M02	16.431	-1.24	3155.6
2025M03	16.588	0.39	4296.2
2025M04	16.787	1.56	196.6
2025M05	16.255	1.19	4311.6

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

P-ISSN: 2580-6084, E-ISSN: 2580-8079

2025M06	16.233	1.38	4095.5
2025M07	16.387	1.69	4177.8
2025M08	16.356	1.60	5573.3
2025M09	16.680	1.82	4198
2025M10	16.640	2.10	2373.8
2025M11	16.644	2.27	2704.9
2025M12	16.782	2.92	2519.1
2026M01	16.786	-0.15	954.3
2026M02	16.758	0.53	1273.3
2026M03	16.993	0.94	3321
2026M04	17.324	1.06	89.1
2026M05	17.789	1.35	-1610.2
2026M06	17.856	1.79	-450.5

Source: BPS

Based on the table above, it is evident that the Indonesian rupiah has continuously depreciated against the US dollar month by month. The exchange rate stood around IDR 14,979 at the beginning of 2023 and experienced persistent depreciation, breaching IDR 17,856 in June 2026. In fact, by early July 2026, the rupiah briefly reached IDR 18,004 per US dollar—marking its highest level since the 1998 Asian financial crisis. This currency depreciation was driven by global geopolitical uncertainties arising from the armed conflict between the United States and Iran.

Concurrently, domestic inflation fluctuated dynamically in response to external pressures and domestic price adjustments. This situation reflects how the Indonesian economy over this period was confronted with severe global uncertainties, where the weakening rupiah directly undermined both external sector stability and domestic price levels. The dynamic depreciation also took a toll on the trade balance; in early 2026, ongoing currency weakening coincided with a trade balance deficit reaching -US\$ 450.5 million.

Previous studies have widely examined the effects of exchange rate volatility on inflation and trade balances. (Sumba, Nyabuto, & Mugambi, 2024) demonstrated that the relationship between currency depreciation, inflation, and monetary policy interest rates is non-linear, suggesting an amplified pass-through effect during periods of severe depreciation. Similarly, (Malec, Maitah, Rojik, Aragaw, & Fulnečková, 2024) examined the relationships among inflation, the exchange rate, and economic growth in Ethiopia

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

using time-series data; their Granger causality test indicated no statistically significant causal link from exchange rates to inflation, with a p-value of 0.366. In the Indonesian context, (Rafulta, Nofrianto, & Amri, 2025) employed a Vector Error Correction Model (VECM) and found that exchange rate fluctuations—as a variable sensitive to global market sentiment—threaten domestic price stability through the mechanism of imported inflation.

Furthermore, empirical evidence regarding the trade balance remains mixed. (Truong & Van Vo, 2023) investigated the relationship between exchange rates and the trade balance in Vietnam, demonstrating that real exchange rate depreciation exerts a significant negative short-term impact, confirming the existence of the J-curve effect. Conversely, (Mutai et al., 2026) analyzed European countries and found that neither exchange rate appreciation nor depreciation had a statistically significant impact on the trade balance. In another study, (Bao & Le, 2021) examined Vietnam's bilateral trade balances with the European Union and the United Kingdom, reporting that both depreciation and appreciation reduced Vietnam's trade balance.

These prior empirical findings reveal clear inconsistencies across the literature, forming an evident research gap regarding the precise impact of exchange rate fluctuations on the trade balance and inflation. Moreover, earlier research exhibits notable limitations. First, relatively few studies concurrently evaluate the dual impact of exchange rates on both inflation and the trade balance in developing economies, including Indonesia. Second, the Structural Vector Autoregression (SVAR) methodology remains rarely applied to examine these simultaneous transmission channels. Consequently, comprehensive empirical research is warranted to enrich macroeconomic literature and bridge this gap.

Addressing this gap, the novelty of this research lies in applying the SVAR methodology with IRF analysis to evaluate the dynamic responses of domestic macroeconomic variables to identify exogenous exchange rate shocks. Moreover, employing recent monthly time-series data from January 2023 to June 2026 offers relevant, up-to-date empirical insights into the contemporary Indonesian economy. Nevertheless, this study is subject to several limitations, notably the limited empirical

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

literature utilizing SVAR in this specific context and the restriction of endogenous variables to only two, which does not capture broader macroeconomic dimensions. Consequently, future research could expand the model specification by incorporating additional variables susceptible to exchange rate shocks, such as composite stock price indices, interest rates, or foreign exchange reserves.

THEORETICAL BACKGROUND

Exchange Rate Pass-Through (ERPT) and Purchasing Power Parity (PPP)

The Exchange Rate Pass-Through (ERPT) theory and the Purchasing Power Parity (PPP) doctrine serve as the foundation for the transmission of currency devaluation to domestic pricing. According to PPP, changes in exchange rates eventually equalize the buying power of various currencies on global markets. However, nominal pricing rigidities, trade barriers, market frictions, and transportation costs prevent absolute price convergence in the short to medium term.

Consequently, exchange rate movements transmit to domestic aggregate price levels through ERPT mechanisms. (Nasir & Vo, 2020) conceptualize ERPT as the elasticity of domestic prices relative to nominal exchange rate movements:

$$\text{ERPT} = \frac{\partial \ln P_t}{\partial \ln E_t}$$

Where P_t represents the domestic aggregate price index and E_t denotes the nominal exchange rate (expressed as units of domestic currency per unit of foreign currency). In an open economy dependent on imported intermediate inputs and capital goods—such as Indonesia—depreciation directly raises the local-currency cost of foreign goods (*direct imported inflation*). Second-round effects occur as elevated input costs cascade into domestic producer prices and wages, shifting the aggregate supply curve upward and triggering persistent headline inflation

Marshall-Lerner Condition and the J-Curve Dynamic

Elasticity approach models, such the Marshall-Lerner (M-L) condition and the empirical J-curve phenomena, control how the trade balance reacts to nominal exchange rate shocks. According to the M-L condition, a real currency depreciation will eventually

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

enhance the trade balance (TB) if and only if the sum of the price elasticities of demand for imports (ε_m) and exports (ε_x) exceeds unity.

$$|\varepsilon_x| + |\varepsilon_m| > 1$$

When this condition is fulfilled, the volume effect—driven by enhanced price competitiveness of domestic goods abroad and reduced domestic demand for imports—outweighs the price effect.

Nonetheless, contractual and supply-chain frictions prevent instantaneous quantity adjustments. In the immediate aftermath of an unexpected currency shock, trade contracts are pre-invoiced in foreign currencies (the *contract currency effect*). Consequently, import values swell in domestic currency terms while export volumes fail to adjust instantaneously, inducing an initial deterioration in the trade balance. Over time, as domestic and global firms adjust delivery contracts and consumption habits, the volume effect dominates, yielding the stylized trajectory known as the J-curve effect.

Conceptual Framework

Based on the background of research, prior empirical studies, and theoretical framework, the conceptual framework for this study is formulated as follows:

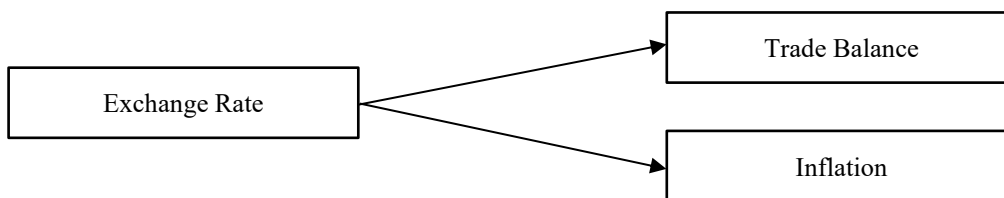


Figure 1. Conceptual Framework

Within the Structural VAR framework, an identification of a 'purely exogenous shock' is conducted—wherein the variable is completely unaffected by other variables in the system and solely affects the remaining endogenous variables. By imposing appropriate structural restrictions, a variable that is inherently endogenous is effectively treated as an exogenous shock. In this study, following the identification and restriction procedures, the exchange rate variable is transformed from an endogenous variable into a 'purely exogenous shock.' The arrows indicate the direction of the shock's transmission to the trade balance and inflation.

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

P-ISSN: 2580-6084, E-ISSN: 2580-8079

METHOD, DATA AND ANALYSIS

This study employs a quantitative method to examine the impact of exchange rate fluctuations (X) on inflation (Y_1) and the trade balance (Y_2). The data used in this study are secondary monthly time-series data spanning from January 2023 to June 2026, obtained from publications by Statistics Indonesia (Badan Pusat Statistik/BPS) and Bank Indonesia. This research focuses on Indonesia over the specified timeframe.

The analytical method applied in this study is Structural Vector Autoregression (SVAR) using time-series data. The SVAR model is employed to analyze the responses of inflation and the trade balance following exchange rate shocks. These dynamic responses are observed through Impulse Response Function (IRF) analysis.

SVAR estimation is utilized to obtain a non-recursive orthogonalized error term for the impulse response analysis, serving as an alternative to the recursive orthogonalization of Cholesky decomposition, which requires imposing sufficient restrictions to identify the orthogonal components of the error terms. The structural VAR (p) model, containing k endogenous variables $y_t = (y_{1t}, \dots, y_{kt})'$, is specified as follows:

$$Ay_t = A_0 + \sum_{i=1}^p A_i y_{t-i} + e_t$$

is a white noise process with a time-invariant positive-definite covariance matrix, such that the residual covariance matrix is given by $\Sigma = \mathbb{E}[e_t e_t']$. The assumption of orthonormal innovations u_t imposes identification restrictions on matrices A and B through the relation $A\Sigma A' = BB'$. Matrix A is a lower-triangular matrix, whereas matrix B is a diagonal matrix, specified as follows:

$$A = \begin{bmatrix} 1 & 0 & 0 \\ a_{21} & 1 & 0 \\ a_{31} & a_{32} & 1 \end{bmatrix}$$

$$B = \begin{bmatrix} b_{11} & 0 & 0 \\ 0 & b_{22} & 0 \\ 0 & 0 & b_{33} \end{bmatrix}$$

In the model above, the ordering of equations reflects the degree of endogeneity among the variables. The second row indicates that the trade balance is affected by

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id
P-ISSN: 2580-6084, E-ISSN: 2580-8079

exchange rate shocks. The third row indicates that inflation is driven by both exchange rate shocks and trade balance shocks (Rahmawati, I Maruddani, & Hoyyi, 2017).

RESULTS

Before estimating the Structural Vector Autoregression (SVAR) model, several preliminary econometric tests must be conducted: (a) stationarity test, (b) optimal lag length selection, (c) model stability test, and (d) cointegration test. Subsequently, the SVAR model is estimated, followed by Impulse Response Function (IRF) analysis.

Stationer Test

Stationarity testing is critical in time-series analysis because non-stationary data can lead to spurious regression and produce results that cannot be generalized to different periods. In this study, the unit root test was conducted using the Augmented Dickey-Fuller (ADF) and Dickey-Fuller methods. The results of the stationarity test are summarized as follows:

Table 2: Stationer test				
ADF test				
Variable	Level		1 st different	
	t-stat	Prob.	t-stat	Prob
ER	-0.477723	0.8853	-5.772964	0.0000
BOT	-4.541553	0.0007	-6.720326	0.0000
INF	-3.878047	0.0048	-6.248486	0.0000

Source: E-Views 14

Based on the stationarity test results using the Augmented Dickey-Fuller (ADF) test, the exchange rate variable is non-stationary at the level, prompting testing at the first difference. In contrast, the trade balance and inflation variables are already stationary at the level. Consequently, the SVAR model in this study is estimated at the first difference.

Optimum Lag Length Test

The optimal lag length test is used to determine the appropriate number of lags to include in the model. In the SVAR framework, lag selection is guided by several information

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

criteria: the Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quinn Information Criterion (HQ). Among these criteria, the optimal lag is selected based on the minimum value of the Akaike Information Criterion (AIC).

Table 3: OptimumLag Length Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-637.3143	NA	2.16e+11	34.61158	34.74220*	34.65763*
1	-626.4892	19.30962*	1.96e+11	34.51293	35.03539	34.69712
2	-616.9290	15.50305	1.92e+11*	34.48265*	35.39695	34.80498
3	-613.9945	4.282814	2.74e+11	34.81051	36.11666	35.27099
4	-608.8415	6.684905	3.56e+11	35.01846	36.71646	35.61708

Source: E-Views 14

Based on the optimal lag test results above, using an initial maximum lag specification of 5, the optimal lag length selected for the SVAR equation in this study is lag 2.

Autocorelation Test

Table 4: Autocorelation Test

Lags	LRE*-Stat	Prob
1	3.047637	0.9625
2	6.477845	0.6920
3	5.893768	0.7511
4	4.733319	0.8573

Source: E-Views 14

The autocorrelation test is conducted to determine whether the residuals exhibit autocorrelation or remain autocorrelation-free at the lag length recommended by the optimal lag selection test. As presented in Table 4, the autocorrelation test results indicate that the model is free from autocorrelation at lag 2, confirming the validity of the lag length suggested by the optimal lag criteria.

Cointegration Test

The cointegration test is used to evaluate co-movement and relational stability throughout the studied series in order to ascertain whether a long-run equilibrium

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

relationship exists among the variables. If the corresponding p-value is less than 0.05, the variables are deemed cointegrated

Tabel 5: Cointegration Test
Unrestricted Cointegration Rank Test (Trace)

Hypothesize d		Trace	0.05 Critical Value	
No. of CE(s)	Eigenvalue	Statistic		Prob.**
None *	0.436131	51.47552	29.79707	0.0000
At most 1 *	0.374709	29.70407	15.49471	0.0002
At most 2 *	0.268127	11.86162	3.841466	0.0006

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesize d		Max-Eigen	0.05 Critical Value	
No. of CE(s)	Eigenvalue	Statistic		Prob.**
None *	0.436131	21.77146	21.13162	0.0406
At most 1 *	0.374709	17.84245	14.26460	0.0130
At most 2 *	0.268127	11.86162	3.841466	0.0006

Source: E-Views 14

The cointegration test is employed to determine whether a long-run equilibrium relationship exists among the variables—specifically, assessing co-movement and stability across the series under study. Variables are considered cointegrated if the corresponding p-value is less than 0.05. In this study, cointegration was examined using Johansen's Cointegration Test based on the Trace Statistic and Maximum Eigenvalue. The Trace Statistic results indicate the presence of two cointegrating vectors at the 5% significance level, a finding corroborated by the Maximum Eigenvalue test.

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

P-ISSN: 2580-6084, E-ISSN: 2580-8079

Stability Test

The model stability test is conducted by examining the unit circle of the Inverse Roots of the autoregressive characteristic polynomial. This stability test is essential to verify that the SVAR model satisfies stability conditions before proceeding with the Structural Impulse Response Function (SIRF) and Structural Forecast Error Variance Decomposition (SFEVD) analyses.

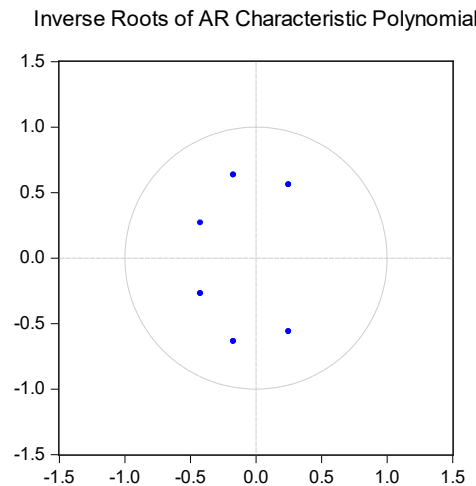


Figure 2. Stability Test

As illustrated in the figure above, all roots have a modulus of less than one and lie strictly within the unit circle. Therefore, the estimated SVAR model satisfies the stability condition and is deemed stable.

Structural Vector Autoregression Estimation Results

The estimation results capturing the effects of exchange rate shocks on the trade balance and inflation across the system are represented by coefficient matrices. The estimated SVAR model parameters are presented as follows:

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

Table 6: Estimation SVAR

Sample (adjusted): 2023M04 2026M06
Included observations: 39 after adjustments
Estimation method: Maximum likelihood via Newton-Raphson (analytic derivatives)
Convergence achieved after 44 iterations
Structural VAR is just-identified

Model: $Ae = Bu$ where $E[uu'] = I$

A =

1	0	0
C(1)	1	0
C(2)	C(3)	1

B =

C(4)	0	0
0	C(5)	0
0	0	C(6)

	Coefficient	Std. Error	z-Statistic	Prob.
C(1)	1.167985	0.902653	1.293947	0.1957
C(2)	4.74E-05	0.000531	0.089340	0.9288
C(3)	1.65E-05	9.22E-05	0.178860	0.8580
C(4)	266.0511	30.12436	8.831760	0.0000
C(5)	1499.748	169.8130	8.831760	0.0000
C(6)	0.863416	0.097763	8.831762	0.0000

Log likelihood -663.2612

Estimated A matrix:

1.000000	0.000000	0.000000
1.167985	1.000000	0.000000
4.74E-05	1.65E-05	1.000000

Estimated B matrix:

266.0511	0.000000	0.000000
0.000000	1499.748	0.000000
0.000000	0.000000	0.863416

Estimated S matrix:

266.0511	0.000000	0.000000
-310.7437	1499.748	0.000000
-0.007490	-0.024729	0.863416

Estimated F matrix:

228.9876	64.00057	-39.05821
-369.0391	695.1438	-128.3745
0.070789	0.073579	0.550737

Source: E-Views 14

The individual SVAR coefficient estimates are not discussed in detail, as the model specification primarily serves to ensure non-spurious regression dynamics. Within an SVAR framework, the primary analytical focus relies on the Impulse Response Function (IRF) and the Forecast Error Variance Decomposition (FEVD) (Gujarati, 1995).

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

DISCUSSION

In alignment with the primary objective of this study—to assess the shocks generated by endogenous variables and trace their effects on the remaining variables in the system—the Impulse Response Function (IRF) is employed. The IRF is constructed from the structural response coefficients, providing insights into the dynamic trajectory of an endogenous variable following an unexpected innovation to another variable. In other words, it quantifies both the short- and long-run magnitude of the impact induced by a one-standard-deviation shock to a specific endogenous variable across all system variables within the SVAR model.

Trade Balance Response to Exchange Rate Shocks

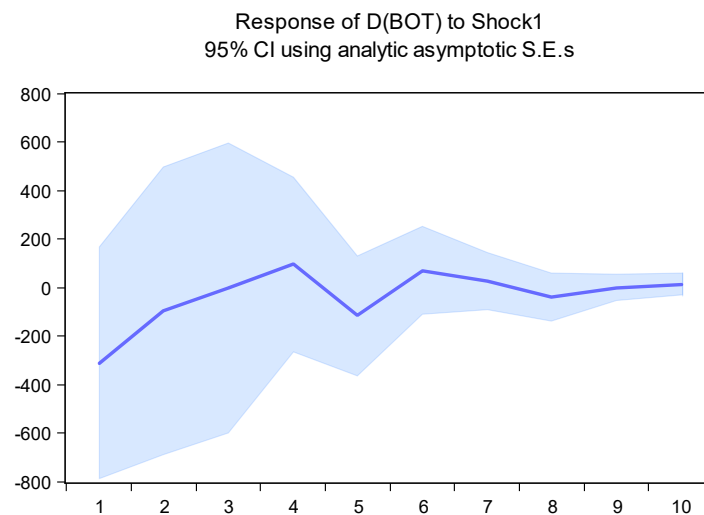


Figure 3. Trade Balance Response to Exchange Rate

Figure 3 illustrates the Impulse Response Function (IRF) of the trade balance following an exchange rate shock. As depicted in the graph, during the initial phase (period 1), the exchange rate shock elicits a sharp negative response from the trade balance, plummeting well below the zero baseline. Over time, however, the response gradually recovers, crossing above the zero line around periods 3 to 4, before exhibiting convergent fluctuations toward long-run equilibrium near the end of the horizon. This trajectory indicates that while exchange rate shocks exert an immediate adverse impact on the trade balance, dynamic adjustments subsequently steer the balance back toward stability.

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

This response pattern aligns with international trade theory, particularly the Marshall-Lerner Condition and the J-Curve effect. Under this framework, currency depreciation or a weakening shock initially deteriorates the trade balance in the short run because trade volumes cannot adjust instantaneously, while the import bill in foreign currency surges immediately (the contract currency effect). Over time, however, the response progressively rebounds into positive territory toward equilibrium, reflecting the dynamic medium-term adjustment of the external sector.

The sharp deterioration of the trade balance in the initial period followed by a gradual recovery is consistent with the J-curve hypothesis. In the very short run, the price elasticities of demand for exports and imports remain inelastic due to rigidities in commercial contracts, notably currency invoicing and exchange rate pass-through delays. Consequently, the import bill inflates before trade volumes can adjust. Indonesia's trade balance is particularly vulnerable to rupiah depreciation in the short term, as raw materials, intermediate inputs, and industrial capital goods account for more than 70% of non-oil and gas imports, causing shocks to immediately amplify import expenditures. Furthermore, Indonesian exports are dominated by natural resource commodities, such as crude palm oil (CPO) and coal, where domestic producers act as price takers in global markets. Accordingly, currency depreciation does not instantaneously expand export volumes within the initial quarters due to binding production capacity constraints and rigid long-term supply agreements.

These empirical findings are consistent with (Hidayah, 2024), who observed that exchange rate volatility and movements significantly affect international trade in Turkey by altering export, import, and overall trade volumes. This result is further corroborated by (Thuy & Thuy, 2019), who revealed that exchange rate fluctuations adversely impact export volume in Vietnam in the short run. Similarly, (Toai, 2025) found that exchange rate increases in Vietnam lead to declining export volumes, particularly for price-sensitive goods. Furthermore, this outcome corroborates (Hakim, 2024), who documented that exchange rate movements negatively influence both the volume and value of exports in Malaysia.

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id
P-ISSN: 2580-6084, E-ISSN: 2580-8079

Inflation Response to Exchange Rate Shocks

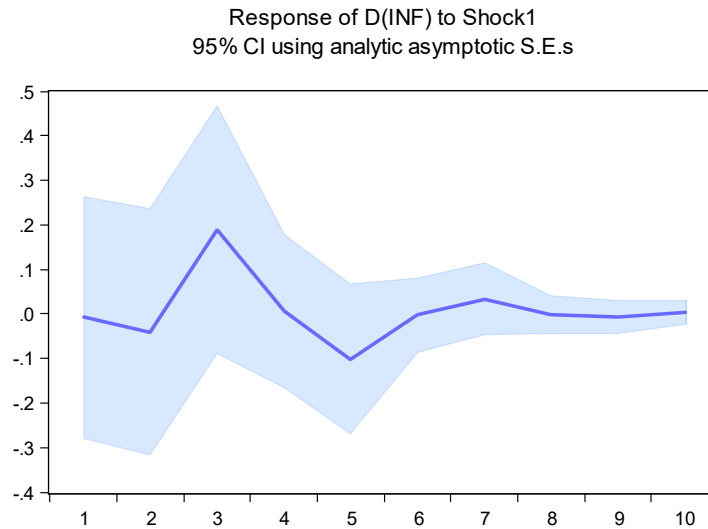


Figure 4. Inflation Response to Exchange Rate

Based on the graph, the response of inflation in the initial periods (periods 1 to 2) hovers around the baseline with a slight downturn. However, by the third period, the response experiences a significant upward spike, reaching its peak. The increase in import costs is transmitted first to producer prices before reaching consumer prices, reflecting a gradual pass-through along the pricing chain. The negative correction in period 5 aligns with monetary policy responses—operating via the Taylor principle—and expectation adjustments that effectively dampen inflationary pressures. Following this peak, the trajectory reverses into negative territory through period 5, before gradually stabilizing and converging toward the zero baseline near the end of the horizon (period 10). This trajectory reflects a temporary transmission of exchange rate shocks to domestic inflation before returning to its long-run equilibrium.

This finding confirms the presence of the Exchange Rate Pass-Through (ERPT) mechanism and imported inflation, wherein currency depreciation does not immediately trigger domestic price increases, but requires a time lag for businesses to pass along higher imported input costs to consumer prices.

Higher domestic inflation relative to trading partners raises the relative price of domestic goods, thereby dampening exports and stimulating imports. Alexander's absorption approach further posits that increased domestic expenditure widens the trade deficit. Through the cost channel, the deteriorating trade balance exerts downward

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

pressure on the exchange rate, and the resulting depreciation stokes inflation via the higher costs of imported final goods and intermediate inputs.

These results are consistent with (Timothy, Ada, & Chigozie, 2016), who found that exchange rate volatility fuels heightened inflationary pressures within an economy. Similarly, (Kaya, Citci, & Dede, 2023) documented that exchange rate movements exert a significant upward effect on inflation over time. Furthermore, (Nuhu, 2021) demonstrated that exchange rate fluctuations in Nigeria have a positive effect on inflation. This evidence is reinforced by (Nadani & Yusuf, 2025), who revealed that exchange rate adjustments in Nigeria drive both economic growth and inflation during periods of regime change. Lastly, these results are corroborated by (Ejaz & Khalid, 2024), who observed that exchange rate shocks have a direct impact on inflation across economies with relatively high volatility, including Pakistan, India, the Philippines, and Turkey.

CONCLUSIONS

Based on the empirical findings, this study concludes that exchange rate fluctuations and shocks significantly impacted international trade performance and macroeconomic stability—specifically regarding inflation dynamics—in Indonesia over the period from January 2023 to June 2026. Employing a Structural Vector Autoregression (SVAR) framework and Impulse Response Function (IRF) analysis, this research traced the transmission of structural shocks across the endogenous variables in the system.

The IRF results reveal that an exchange rate shock elicits an immediate negative response from the trade balance in the initial phase (period 1), dropping sharply below the zero baseline. Over time, however, the response gradually rebounds, crossing into positive territory around periods 3 to 4, before exhibiting convergent fluctuations toward long-run equilibrium near the end of the horizon. This dynamic indicates an initial deterioration in the trade balance followed by a progressive, stabilizing adjustment process. Furthermore, the IRF analysis for inflation indicates that the response initially hovers near the baseline during periods 1 and 2 with a minor decline, followed by a sharp upward spike in period 3 where it reaches its peak. Thereafter, the response reverses into

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id
P-ISSN: 2580-6084, E-ISSN: 2580-8079

negative territory through period 5 before gradually stabilizing and converging toward the zero-equilibrium line by period 10. This trajectory demonstrates a temporary pass-through of exchange rate innovations to domestic inflation prior to returning to equilibrium.

REFERENCES

- Bao, H. H. G., & Le, H. P. (2021). Asymmetric impact of exchange rate on trade between Vietnam and each of EU-27 countries and the UK: evidence from nonlinear ARDL and the role of vehicle currency. *Heliyon*, 7(6), e07344. <https://doi.org/10.1016/j.heliyon.2021.e07344>
- Ejaz, M., & Khalid, Q. (2024). Empirical Analysis Of Pass Through Of Exchange Rate And Its Volatility To Inflation In Selected Emerging Economies. *Pakistan Journal of Applied Economics*, 34(1), 39–70.
- Gujarati, D. N. (1995). *Ekonometrika Dasar*. Jakarta: Erlangga.
- Hakim, A. (2024). Exchange Rate Volatility and Export Performance: Case of Malaysia. *International Journal of Economics*, 9(2), 1–12. <https://doi.org/10.47604/ijecon.2445>
- Hidayah, N. (2024). Exchange Rate Volatility and International Trade in Turkey. *International Journal of Finance and Accounting*, 9(1), 46–56.
- Kaya, H., Citci, S. H., & Dede, Y. (2023). The relationship between exchange rate volatility and inflation in Turkey. *Pressacademia*, 2023(47), 225–227. <https://doi.org/10.17261/pressacademia.2023.1701>
- Malec, K., Maitah, M., Rojik, S., Aragaw, A., & Fulnečková, P. R. (2024). Inflation, exchange rate, and economic growth in Ethiopia: A time series analysis. *International Review of Economics and Finance*, 96(May). <https://doi.org/10.1016/j.iref.2024.103561>
- Monadjemi, M., & Lodewijks, J. (2021). International Evidence on Purchasing Power Parity: A Study of High and Low Inflation Countries. *Journal of Economics and Management Sciences*, 4(3). <https://doi.org/doi.org/10.30560/jems.v4n3p1>
- Mutai, N. C., Krasniqi, N., Olagunju, O. K., Mutuku, M. C., Gjokaj, E., & Ferasso, M. (2026). Rethinking exchange rate effects on trade balances: evidence from the

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

- European Union. *Journal of International Trade Law and Policy*, 1–20. <https://doi.org/https://doi.org/10.1108/JITLP-10-2025-0096>
- Nadani, A. A., & Yusuf, S. (2025). Impact of Exchange Rate Volatility Regime Switching on Inflation in Nigeria. *Advanced Research in Economics and Business Strategy Journal*, 6(1), 101–117. <https://doi.org/10.52919/arebus.v6i01.75>
- Nasir, M. A., & Vo, X. V. (2020). A quarter century of inflation targeting & structural change in exchange rate pass-through: Evidence from the first three movers. *Structural Change and Economic Dynamics*, 54, 42–61. Retrieved from doi.org/10.1016/j.strueco.2020.03.010
- Nuhu, M. (2021). Impact of Exchange Rate Volatility on Inflation in Nigeria. *Journal of Contemporary Research in Business, Economics and Finance*, 3(1), 26–38. <https://doi.org/10.33094/26410265.2021.31.26.38>
- Rafulta, E., Nofrianto, A., & Amri, M. A. (2025). Pemodelan: Hubungan nilai tukar rupiah terhadap dollar Amerika dan inflasi menggunakan vector error correction model (VECM). *Prosiding Seminar Nasional Sains Dan Teknologi Seri III*, 2.
- Rahmawati, A., I Maruddani, D. A., & Hoyyi, A. (2017). Structural Vector Autoregressive Untuk Analisis Dampak Shock Nilai Tukar Rupiah Terhadap Dolar Amerika Serikat Pada Indeks Harga Saham Gabungan. *Jurnal Gaussian*, 6, 291–302.
- Shubaita, E., & Seraj, M. (2020). Investigating in the J-Curve Phenomenon in Tunisia-ARDL Bound Test Approach. *Journal of Economics and Behavioral Studies*, 12(5), 23–32. [https://doi.org/https://doi.org/10.22610/jebis.v12i5\(J\).3077](https://doi.org/https://doi.org/10.22610/jebis.v12i5(J).3077)
- Sumba, J. O., Nyabuto, K. O., & Mugambi, P. J. (2024). Exchange rate and inflation dynamics in Kenya: Does the threshold level matter? *Heliyon*, 10(15), e35726. <https://doi.org/10.1016/j.heliyon.2024.e35726>
- Thuy, V. N. T., & Thuy, D. T. T. (2019). The Impact of Exchange Rate Volatility on Exports in Vietnam: A Bounds Testing Approach. *Journal of Risk and Financial Management*, 12(1). <https://doi.org/10.3390/jrfm12010006>
- Timothy, O. T., Ada, M. S., & Chigozie, A. O. (2016). Exchange Rate Volatility and Inflation: The Nigerian Experience. *Journal of Economics and Sustainable Development*, 7(10), 6–15. Retrieved from www.iiste.org
- Toai, D. B. (2025). The Effect of Exchange Rate Volatility on Vietnam's Import and

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id

Export Structure. *Financial Economics Insights*, 2(1), 62–70.
<https://doi.org/10.70088/cye65292>

Truong, L. D., & Van Vo, D. (2023). The asymmetric effects of exchange rate on trade balance of Vietnam. *Heliyon*, 9(4), e14455.
<https://doi.org/10.1016/j.heliyon.2023.e14455>

¹Email: muhammad.arrozi@isi-padangpanjang.ac.id

²*Corresponden Author, Email: muhammad.arrozi@isi-padangpanjang.ac.id
P-ISSN: 2580-6084, E-ISSN: 2580-8079