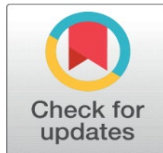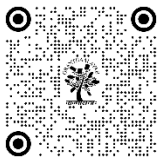# EFFECT OF SELECT MACRO ECONOMIC FACTORS ON EXCHANGE RATE VOLATILITY (WITH REFERENCE TO INR/USD)

Mrs. Usha B[1] ✉ , Dr. Babitha Thimmaiah .N[2] ✉

[1] Research Scholar, Department of Management Studies, VTU - Post Graduation Centre, Mysuru
[2] Assistant Professor, Department of Management Studies, VTU - Post Graduation Centre, Mysuru

ABSTRACT

Exchange rate volatility plays a critical role in shaping a nation's economic stability and trade competitiveness. This study examines the effect of select macroeconomic factors on INR/USD exchange rate volatility, considering their significance in the present global economic landscape. The research aims to assess how imports, Foreign Institutional Investment (FII), Wholesale Price Index (WPI), interest rates, and foreign exchange reserves influence exchange rate fluctuations. A descriptive research method was employed, utilizing secondary data from 2011 to 2023. The GARCH (Generalized Autoregressive Conditional Heteroskedasticity) model with ML - ARCH (Marquardt) - Normal distribution was applied to analyze exchange rate volatility. The study tested five hypotheses to determine the significance of macroeconomic variables in explaining exchange rate fluctuations. The findings reveal that imports, WPI, interest rates, and foreign exchange reserves have a significant impact on INR/USD exchange rate volatility, while FII does not exhibit a statistically significant effect. The results emphasize the need for effective trade policies, inflation control, and strategic Forex reserve management to ensure exchange rate stability. As global financial markets evolve, the study underscores the importance of dynamic policy frameworks to manage exchange rate risks and enhance economic resilience.

Keywords: Exchange Rate Volatility, Macroeconomic Factors, GARCH Model, INR/USD, Foreign Exchange Reserves

1. INTRODUCTION

Exchange rate volatility is a critical concern for policymakers, businesses, and investors, as it directly influences trade balance, inflation, and capital flows. The Indian Rupee (INR) against the US Dollar (USD) has experienced significant fluctuations due to various macroeconomic factors, including interest rates, inflation, GDP growth, and foreign direct investment. These factors shape currency demand and supply dynamics, affecting India's global trade competitiveness. Given the increasing integration of the Indian economy with global financial markets, understanding the drivers of exchange rate volatility has become crucial for economic stability. Recent global economic uncertainties, such as the Federal Reserve's monetary policy changes, geopolitical tensions, and fluctuating crude oil prices, have further exacerbated currency fluctuations. These developments necessitate an in-depth analysis of how macroeconomic factors influence exchange rate movements.

According to the Reserve Bank of India (RBI), the Indian Rupee depreciated by approximately 8.5% against the US Dollar in 2022, reflecting heightened external pressures and domestic economic challenges. The exchange rate, which stood at around Rs.74 per USD in early 2022, crossed Rs.83 by the year-end, driven by tightening monetary policies in the US and rising trade deficits. This trend underscores the importance of studying key macroeconomic determinants affecting exchange rate volatility. Factors such as inflation differentials between India and the US, interest rate parity, and capital inflows continue to shape the INR/USD exchange rate movements. Moreover, India's expanding foreign exchange reserves and policy interventions by the RBI play a crucial role in mitigating excessive volatility. Understanding these relationships can help policymakers design strategies to enhance exchange rate stability and support long-term economic growth.

2. CONCEPTUAL FRAMEWORK

Exchange rate volatility refers to unpredictable fluctuations in the value of a currency relative to another, driven by various macroeconomic and external factors. In the context of the INR/USD exchange rate, key macroeconomic determinants include interest rates, inflation, trade balance, foreign direct investment (FDI), and money supply. The Interest Rate Parity (IRP) theory suggests that differences in interest rates between two countries influence exchange rate movements, with higher interest rates attracting capital inflows and strengthening the domestic currency. Inflation, as explained by the Purchasing Power Parity (PPP) theory, affects the real value of a currency; higher inflation in India compared to the US tends to weaken the Rupee. Additionally, trade imbalances—where imports exceed exports—lead to higher demand for the US Dollar, causing INR depreciation. These fundamental macroeconomic relationships form the basis for assessing exchange rate volatility in an emerging economy like India.

The interaction between macroeconomic factors and exchange rate volatility is further influenced by global financial market conditions, investor sentiment, and central bank interventions. The Balance of Payments (BoP) framework highlights the role of capital account transactions, where higher FDI and foreign institutional investments (FII) contribute to currency appreciation, while capital outflows trigger depreciation. The Reserve Bank of India (RBI) plays a crucial role in managing exchange rate stability through interventions such as forex reserve management and open market operations. Moreover, speculative activities in the forex market, driven by global risk perceptions and economic policies, can amplify exchange rate volatility. Given India's increasing integration into the global economy, a comprehensive understanding of these macroeconomic linkages is essential for policymakers, businesses, and investors to mitigate risks and develop informed strategies in foreign exchange management.

3. REVIEW OF LITERATURE

Wafaa Sbeiti& Moid Uddin (2025) investigates the exchange rate dynamics within the BRICS countries and how they interact with specific macroeconomic variables. The study revealed a significant negative two-way relationship between the Chinese currency and the currencies of South Africa and Russia. Ahmed & Abidar (2025) analyzes the impact of exchange rate fluctuations on economic growth in emerging markets, with a particular focus on Morocco during the period 1994-2022. And found a negative correlation between exchange rate depreciation and economic growth, suggesting that prudent exchange rate management is crucial to supporting economic development. Ibrahim & Patrick (2025) used data from a specific era to analyze the macroeconomic factors of financial success in Ghana's listed manufacturing enterprises to y investigates how inflation, exchange rate variations, Gross Domestic Product (GDP) growth rates, and interest rate changes affect key financial measures, notably Return on Equity and Return on Assets. Ozigbo & Rapheal (2025) investigates the relationship between exchange rate fluctuations and economic growth in Nigeriato find out the impact of inflation rate, interest rate and external reserve on growth of the economy. Nwosu & Mairafi (2025) examines the effect of macroeconomic factors, particularly gross domestic product and interest rates, on the financial performance of selected quoted manufacturing firms in Nigeria, using Tobin's Q as a proxy for firm performance.

Nicholas & Johnson (2025) examined the effect of Crude oil price volatility on exchange rate and employment generation in planning of economic activities in Nigeria and found out that crude oil price volatility had a significant impact on exchange rate and employment generation in the area under study. Nidhi and Naresh (2025) found that an increase in all these variables has long-run and short-run asymmetric causality with outward foreign direct investment (OFDI),

except for the inflation rate. The inflation rate has no significant long-run relationship with OFDI. Elian & Ahmed Bani (2025) examines impact of economic growth, exchange rate volatility, and the real exchange rate on Foreign Direct Investment (FDI) inflows to BRICS economies. The results indicate that economic growth is a positive significant determinant of FDI inflows in both the short and long term. Amir & Forouzan (2025) investigate the asymmetric and threshold effect of exchange rate shocks on stock market fluctuations. The variables of exchange rate, gold price, oil price, housing price index, and stock returns from the winter of 2014-6 to the spring of 2021 were used to investigate the threshold effects of exchange rate shocks on stock market fluctuations. Raden & Kery (2025) investigates the asymmetric influences of exchange rate fluctuations on trade performance and economic growth within eight of ASEAN's largest economies over a comprehensive period spanning from 1970 to 2019.

Simeon & Gini (2025) empirically X-rays the influence of macroeconomic variables on exchange rate volatility in Nigeria between 1990 and 2023. Exchange rate serves as the dependent variable with inflation rate, lending interest rate, crude oil price, money supply and level of import serving as macroeconomic variables/regressors. Andrej Privara & Raheel (2025) reveal that the exchange rates of Singapore and UAE are notably affected by net fluctuations, while results across other countries exhibit inconsistency. And their analysis uncovers evidence of time-dependent and bilateral transmission of shocks between the oil and foreign exchange markets. Aniba & Mir Zeeshan (2025) investigated the short- and long-term impacts of macroeconomic factors on Pakistan's economic growth using an Auto Regressive Distributed Lag (ARDL) model. And found over the long run, FDI and the exchange rate have a positive and large impact on economic growth, while inflation and the real interest rate have a negative and negligible impact. Idriss (2025) aims to empirically analyze the impact of exchange rate flexibility on macroeconomic instability by addressing the following central question: To what extent would the Moroccan economy have been unstable if the country had adopted a floating exchange rate regime?. Vida Babazadeh (2025) examines the impact of exchange rate changes on economic growth in Türkiye from a Keynesian perspective. Using quarterly data for the period 1998-2023, we set an empirical model. By rigorously analyzing real exchange rate data.

Hussain & Ali (2024) examines the effects of exchange rate and net exports on manufacturing enterprises' profitability on the Pakistan Stock Exchange (PSX). Their main objective is to examine the direction and magnitude of the moderating influence of exchange rate fluctuations on net exports and the return on assets. Audi& Marc (2024) seek to clarify this debate by examining the specific impact of exchange rate volatility on the economic growth of Lebanon, utilizing annual time series data spanning from 1980 to 2023. Muhammad Naveed & Abdul (2023) focus on examining the impact of macroeconomic variables, i.e., GDP growth, GDP per capita, inflation, FDI, exports, imports, interest rates, foreign debt and foreign reserves on the exchange rate regimes, using the sample of five countries from MSCI developed markets index, emerging markets index and frontier markets index each from 1970 to 2020. Hao-Chang &Syarifuddin(2022) analyzes the impact of foreign exchange futures volatility on macroeconomic variables by using data of ten trading markets from 2011 to 2020. And their findings illustrate that the volatility of foreign exchange futures significantly affects various macroeconomic indicators. Iortyer &Abu Maji (2022) investigated the impact of some macroeconomic variables (real gross domestic product, foreign direct investment, aggregate government expenditure, and real exchange rate) as drivers and catalyst to the performance of the Nigeria stock market, utilizing the time series data from 1986 – 2020.

4. PROBLEM STATEMENT
Exchange rate volatility remains a critical challenge for emerging economies, particularly in the context of INR/USD fluctuations. Existing literature highlights the significant influence of macroeconomic factors such as inflation, interest rates, foreign direct investment, crude oil prices, and trade balances on currency stability. However, the interplay of these factors in the Indian context, considering recent global economic uncertainties, remains underexplored. While studies on BRICS and other emerging economies provide insights into exchange rate dynamics, there is a need for a focused analysis on how select macroeconomic variables drive INR/USD volatility. This research aims to bridge this gap by examining the key macroeconomic determinants influencing exchange rate fluctuations, offering empirical insights that can aid policymakers in managing currency stability and mitigating economic risks.

5. OBJECTIVE OF THE STUDY

To analyze the impact of select macroeconomic factors on the volatility of the INR/USD exchange rate, and to identify the extent to which these factors contribute to currency fluctuations in the Indian context.

6. RESEARCH METHODOLOGY

6.1 RESEARCH METHOD

This study adopts a descriptive research method to analyze the effect of select macroeconomic factors on INR/USD exchange rate volatility. By examining historical data over a 13-year period (2011–2023), the study aims to establish the relationship between key macroeconomic indicators and currency fluctuations.

6.2 PERIOD OF STUDY

The research covers the period from 2011 to 2023, providing a comprehensive view of the long-term trends and patterns in exchange rate volatility.

6.3 SOURCE OF DATA

The study relies on secondary data sourced from reputable financial and economic databases, including the Reserve Bank of India (RBI), World Bank, International Monetary Fund (IMF), and Bloomberg. This ensures data accuracy and reliability.

6.4 VARIABLES OF THE STUDY

    a. Dependent Variable: INR/USD Exchange Rate Volatility
    b. Independent Variables
- Imports: Higher imports increase demand for foreign currency, impacting exchange rate volatility.
- Foreign Institutional Investment (FII): Affects capital inflows and influences currency value.
- Wholesale Price Index (WPI): Represents inflationary trends, affecting purchasing power parity.
- Interest Rate: Determines capital flow dynamics and exchange rate movements.
- Foreign Exchange Reserves: A buffer against volatility, influencing exchange rate stability.

6.5 HYPOTHESIS OF THE STUDY

H_0: There is no significant impact of select macroeconomic factors (Imports, FII, WPI, Interest Rate, and Foreign Exchange Reserves) on INR/USD exchange rate volatility.

6.6 TOOLS OF ANALYSIS

To analyze the effect of macroeconomic variables on INR/USD exchange rate volatility, the study employs the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model using the Maximum Likelihood Estimation (ML) - ARCH (Marquardt) - Normal Distribution method. The GARCH model is well-suited for capturing financial time series volatility and provides robust insights into the dynamic behavior of exchange rate fluctuations.

7. DATA ANALYSIS & INTERPRETATION

Table – 1 GARCH TEST - Effect of Import on INRUSD Exchange rate volatility

Dependent Variable: INRUSD				
Method: ML - ARCH (Marquardt) - Normal distribution				
Convergence achieved after 26 iterations				
Presample variance: backcast (parameter = 0.7)				
GARCH = C(3) + C(4)*RESID(-1)^2 + C(5)*GARCH(-1)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-6.293731	1.676089	-3.755010	0.0002
Import	0.702400	0.110862	6.335791	0.0000
Variance Equation				
C	-0.000205	0.001812	-0.113088	0.9100

RESID(-1)^2	-0.259380	0.356257	-0.728071	0.4666
GARCH(-1)	1.222691	0.437011	2.797852	0.0051*
R-squared	0.568657	Mean dependent var		4.165458
Adjusted R-squared	0.529444	S.D. dependent var		0.141843
S.E. of regression	0.097300	Akaike info criterion		-1.761507
Sum squared resid	0.104141	Schwarz criterion		-1.544219
Log likelihood	16.44979	Hannan-Quinn criter.		-1.806169
Durbin-Watson stat	0.850094			

Source: Financial and Economic Database – EVIEWS Output

The results of the GARCH model estimation indicate a significant impact of Imports on INR/USD exchange rate volatility. The coefficient for Imports (0.7024) is positive and statistically significant at the 1% level (p-value = 0.0000), suggesting that an increase in imports leads to higher exchange rate volatility. This aligns with the economic theory that rising imports increase the demand for foreign currency, thereby influencing the exchange rate. The variance equation shows that the lagged GARCH term (1.2227, p = 0.0051) is also significant, implying that past volatility significantly affects future exchange rate fluctuations. However, the RESID(-1)^2 term is insignificant, indicating that past shocks do not have a strong direct effect on volatility. The R-squared value (0.5687) suggests that the model explains about 57% of the variations in exchange rate volatility. Overall, the findings highlight the critical role of import dependence in driving INR/USD exchange rate fluctuations, emphasizing the need for balanced trade policies to manage currency stability.

Table – 2 GARCH TEST - Effect of Foreign Institutional Investment on INRUSD Exchange rate volatility

Dependent Variable: INRUSD				
Method: ML - ARCH (Marquardt) - Normal distribution				
Convergence achieved after 26 iterations				
Presample variance: backcast (parameter = 0.7)				
GARCH = C(3) + C(4)*RESID(-1)^2 + C(5)*GARCH(-1)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	4.697841	0.424681	11.06206	0.0000
FII	-0.043358	0.038686	-1.120789	0.2624
Variance Equation				
C	0.001356	0.001410	0.961638	0.3362
RESID(-1)^2	-0.369446	0.329295	-1.121930	0.2619
GARCH(-1)	1.273752	0.563669	2.259751	0.0238*
R-squared	0.095069	Mean dependent var		4.165458
Adjusted R-squared	0.012802	S.D. dependent var		0.141843
S.E. of regression	0.140932	Akaike info criterion		-1.180277
Sum squared resid	0.218481	Schwarz criterion		-0.962989
Log likelihood	12.67180	Hannan-Quinn criter.		-1.224940
Durbin-Watson stat	0.629702			

Source: Financial and Economic Database – EVIEWS Output

The GARCH model results suggest that Foreign Institutional Investment (FII) does not have a statistically significant impact on INR/USD exchange rate volatility. The coefficient for FII (-0.0434) is negative, indicating a potential stabilizing effect of FII on exchange rate fluctuations, but it is not statistically significant (p = 0.2624). This implies that variations in foreign institutional investments do not strongly influence exchange rate volatility in the given period. The variance equation shows that the GARCH(-1) term (1.2738, p = 0.0238) is significant, suggesting that past volatility influences current fluctuations. However, the RESID(-1)^2 term is insignificant, indicating that past shocks do not have a strong direct effect on volatility. The R-squared value (0.0951) is quite low, suggesting that the model explains only about 9.5% of the variations in exchange rate volatility. These findings indicate that FII alone may not be a key driver of INR/USD volatility and that other macroeconomic factors may play a more dominant role in influencing currency fluctuations.

Table – 3 GARCH TEST - Effect of WPI on INRUSD Exchange rate volatility

Dependent Variable: INRUSD
Method: ML - ARCH (Marquardt) - Normal distribution
Convergence achieved after 54 iterations

Presample variance: backcast (parameter = 0.7)			
GARCH = C(3) + C(4)*RESID(-1)^2 + C(5)*GARCH(-1)			
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.276577	1.530006	-0.180768	0.8565
WPI	0.942890	0.322838	2.920629	0.0035
Variance Equation			
C	0.000246	0.001019	0.241286	0.8093
RESID(-1)^2	-0.376812	0.533341	-0.706513	0.4799
GARCH(-1)	1.323461	1.001858	1.321007	0.1865
R-squared	0.356111	Mean dependent var		4.165458
Adjusted R-squared	0.297576	S.D. dependent var		0.141843
S.E. of regression	0.118880	Akaike info criterion		-1.942371
Sum squared resid	0.155457	Schwarz criterion		-1.725083
Log likelihood	17.62541	Hannan-Quinn criter.		-1.987034
Durbin-Watson stat	0.333389			

Source: Financial and Economic Database – EVIEWS Output

The GARCH model results indicate that the Wholesale Price Index (WPI) has a significant impact on INR/USD exchange rate volatility. The coefficient for WPI (0.9429) is positive and statistically significant (p = 0.0035), suggesting that higher inflation, as measured by WPI, leads to increased exchange rate volatility. This aligns with economic theory, where rising inflation erodes purchasing power, prompting currency fluctuations. However, the variance equation results show that the RESID(-1)^2 term (-0.3768, p = 0.4799) and GARCH(-1) term (1.3235, p = 0.1865) are not statistically significant, indicating that past shocks and past volatility do not strongly influence current fluctuations. The R-squared value (0.3561) suggests that 35.6% of the variations in exchange rate volatility are explained by WPI. These findings highlight the crucial role of inflationary pressures in driving exchange rate instability, emphasizing the need for effective inflation management policies to maintain currency stability.

Table – 4 GARCH TEST - Effect of Interest Rate on INRUSD Exchange rate volatility

Dependent Variable: INRUSD			
Method: ML - ARCH (Marquardt) - Normal distribution			
Convergence achieved after 52 iterations			
Presample variance: backcast (parameter = 0.7)			
GARCH = C(3) + C(4)*RESID(-1)^2 + C(5)*GARCH(-1)			
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	5.396003	0.193427	27.89686	0.0000
Interest Rate	-0.613883	0.102227	-6.005112	0.0000
Variance Equation			
C	0.000155	0.002330	0.066561	0.9469
RESID(-1)^2	-0.262523	0.639181	-0.410718	0.6813
GARCH(-1)	1.105996	1.372487	0.805834	0.4203
R-squared	0.508757	Mean dependent var		4.165458
Adjusted R-squared	0.464098	S.D. dependent var		0.141843
S.E. of regression	0.103837	Akaike info criterion		-2.090430
Sum squared resid	0.118603	Schwarz criterion		-1.873142
Log likelihood	18.58780	Hannan-Quinn criter.		-2.135093
Durbin-Watson stat	0.696192			

Source: Financial and Economic Database – EVIEWS Output

The GARCH model results indicate that Interest Rate has a significant negative impact on INR/USD exchange rate volatility. The coefficient for Interest Rate (-0.6139) is statistically significant (p = 0.0000), suggesting that an increase in interest rates reduces exchange rate volatility. This finding aligns with economic theory, as higher interest rates often attract foreign capital inflows, stabilizing the domestic currency. However, the variance equation results show that both RESID(-1)^2 (-0.2625, p = 0.6813) and GARCH(-1) (1.1060, p = 0.4203) are insignificant, indicating that past shocks and past volatility do not strongly influence current fluctuations. The R-squared value (0.5088) suggests that 50.88% of the variations in exchange rate volatility are explained by interest rate changes. These results highlight the crucial role of

monetary policy in managing exchange rate stability, emphasizing the need for careful interest rate adjustments to minimize currency fluctuations.

Table – 5 GARCH TEST - Effect of Foreign Exchange Reserve on INRUSD Exchange rate volatility

Dependent Variable: INRUSD				
Method: ML - ARCH (Marquardt) - Normal distribution				
Convergence achieved after 95 iterations				
Presample variance: backcast (parameter = 0.7)				
GARCH = C(3) + C(4)*RESID(-1)^2 + C(5)*GARCH(-1)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.804586	0.314567	-2.557758	0.0105
Foreign Exchange Reserve	0.336194	0.021083	15.94645	0.0000
Variance Equation				
C	0.000282	0.000171	1.655100	0.0979
RESID(-1)^2	-0.301877	0.216647	-1.393404	0.1635
GARCH(-1)	1.102245	0.405057	2.721208	0.0065 *
R-squared	0.870677	Mean dependent var		4.165458
Adjusted R-squared	0.858920	S.D. dependent var		0.141843
S.E. of regression	0.053277	Akaike info criterion		-3.309512
Sum squared resid	0.031223	Schwarz criterion		-3.092223
Log likelihood	26.51183	Hannan-Quinn criter.		-3.354174
Durbin-Watson stat	1.054151			

Source: Financial and Economic Database – EVIEWS Output

The GARCH model results indicate that Foreign Exchange Reserves (FER) have a significant positive impact on INR/USD exchange rate volatility. The coefficient for FER (0.3362) is statistically significant (p = 0.0000), suggesting that an increase in reserves leads to higher exchange rate fluctuations. This finding contrasts with conventional expectations, where higher reserves are typically associated with currency stability. However, this could imply that reserve accumulation strategies or market interventions might be triggering speculative activities, leading to volatility. The variance equation shows that the GARCH(-1) term (1.1022, p = 0.0065) is significant, indicating that past volatility strongly influences current fluctuations. The high R-squared value (0.8707) suggests that 87.07% of the variations in exchange rate volatility are explained by foreign exchange reserves. These findings highlight the critical role of reserve management policies in stabilizing exchange rates and mitigating excessive currency fluctuations.

8. RESULTS AND DISCUSSION

- The coefficient of Import (0.7024) is statistically significant (p = 0.0000), indicating that increased imports lead to higher INR/USD exchange rate volatility. The R-squared value (0.5687) shows that imports explain 56.87% of exchange rate fluctuations.
- The coefficient for FII (-0.0434) is not statistically significant (p = 0.2624), suggesting that FII inflows do not substantially impact exchange rate volatility. The low R-squared value (0.0951) further supports that FII does not strongly influence the INR/USD volatility.
- The coefficient for WPI (0.9429) is statistically significant (p = 0.0035), indicating that rising inflation (WPI) increases exchange rate fluctuations. The R-squared value (0.3561) implies that 35.61% of the variations in INR/USD volatility are due to WPI changes.
- The coefficient for Interest Rate (-0.6139, p = 0.0000) shows that higher interest rates reduce exchange rate volatility. The R-squared value (0.5088) suggests that 50.88% of INR/USD fluctuations are explained by interest rate variations.
- The coefficient for FER (0.3362, p = 0.0000) is positive and statistically significant, indicating that higher reserves lead to greater exchange rate fluctuations. The high R-squared value (0.8707) suggests 87.07% of volatility is explained by FER, making it the most influential factor in this study.
- The GARCH(-1) terms are statistically significant across models, confirming that previous exchange rate fluctuations significantly impact future volatility.

- The results reveal that imports, WPI (inflation), interest rates, and foreign exchange reserves significantly influence exchange rate fluctuations, while Foreign Institutional Investment (FII) does not have a notable impact.
- Given that higher imports increase volatility, policymakers should promote domestic production and export incentives to reduce excessive reliance on imports and stabilize exchange rates.
- Since FER significantly contributes to volatility ($R^2 = 0.8707$), intervention strategies should be carefully executed to avoid unintended fluctuations in INR/USD exchange rates.
- The strong positive correlation between WPI and exchange rate volatility suggests that tightening inflation control measures (e.g., effective monetary policy, supply chain efficiency) can help reduce excessive exchange rate movements.

9. CONCLUSION

The study provides valuable insights into the effect of select macroeconomic factors on INR/USD exchange rate volatility, emphasizing the significant roles of imports, WPI, interest rates, and foreign exchange reserves in driving currency fluctuations. The findings highlight the necessity for robust trade policies, inflation control measures, and effective foreign exchange reserve management to ensure exchange rate stability. As global financial markets become increasingly interconnected, the volatility of the Indian rupee is expected to be influenced by both domestic and international economic conditions. Given the rising integration of digital currencies, fin-tech innovations, and global trade shifts, future exchange rate fluctuations may also be shaped by emerging financial technologies and geopolitical factors. Policymakers must adopt dynamic strategies to mitigate currency risks and strengthen India's economic resilience in a rapidly evolving global financial landscape. Future research can explore the impact of crypto currency adoption, central bank digital currencies (CBDCs), and geopolitical risks on exchange rate volatility. Additionally, studying the role of AI-driven financial forecasting models in predicting currency fluctuations could provide new dimensions for managing exchange rate risks effectively.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

BIBLIOGRAPHY

Sbeiti, W., Ahmad, M. U., AlKhashti, F., & Haddad, A. E. (2025). Exchange Rate Dynamics and Macroeconomic Factors: A Comparative Study of BRICS Countries. Global Journal of Emerging Market Economies, 09749101251317482. https://doi.org/10.1177/09749101251317482

Touzani, A., & Brahim, A. (2025). Empirical Analysis of the Impact of Exchange Rates on Economic Growth in Emerging Countries: Case of Morocco. International Journal of Economics and Financial Issues, 15(2), 411-416.https://doi.org/10.32479/ijefi.17992

Zubairu, I., Atiawin, P. A., Iddrisu, A. J., & Amanquah, B. A. (2025). Assessing the Effects of Macroeconomic Factors on the Financial Performance of Ghanaian Listed Manufacturing Companies. International Journal of Accounting, 10(1), 23-41.https://doi.org/10.11648/j.ijafrm.20251001.12

Ozigbo, S. A., Ekane, R. O., & Ujuju, L. E. (2025). Exchange Rate Fluctuations and Economic Growth in Nigeria: An Empirical Analysis. International Journal of Economics and Financial Issues, 15(2), 252-259.https://doi.org/10.32479/ijefi.17833

Nwosu, O., Mairafi, S. L., Musa, A. A., & Kolo, I. (2025). Effect of Macro Economic Factors on Financial Performance of Selected Quoted Manufacturing Companies in Nigeria. Journal of Human Resources and Management Science.https://doi.org/10.70382/hujhrms.v7i7.006

Achilike, N. I., Nwokeiwu, J., & Adama, L. Effect of Crude Oil Price Volatility on Exchange Rate and Employment Generation in Nigeria.

Singhal, N., & Kumar, N. (2025). The Non-linear Effects of Selected Macroeconomic Variables on Outward Foreign Direct Investment from India. Journal of Asian Economic Integration, 26316846241304162.https://doi.org/10.1177/26316846241304162

Elian, M. I., Bani-Mustafa, A., Sawalha, N., Alsaber, A. R., & Pan, J. (2025). Impact of economic growth and exchange rate volatility on FDI inflows: cointegration and causality tests for the BRICS countries. International Journal of Economics and Financial Issues, 15(1), 42-54.https://doi.org/10.32479/ijefi.17311

Asgari, A. , Mohammadi Yarijani, F. , Moradi, A. and Ghanizadeh, A. (2025). The threshold effect of exchange rate shocks on stock market fluctuations. International Journal of Nonlinear Analysis and Applicationshttps://doi.org/10.22075/ijnaa.2024.33390.4971

Parianom, R., Utami, K., & Hidayati, S. Differential Impacts of Exchange Rate Fluctuations on Trade Balance and Economic Output.https://doi.org/10.57239/PJLSS-2024-22.2.001727

Obode, S. O., & Gini, K. B. (2025). An Empirical Analysis of the Impact of Macroeconomics Variables on Exchange Rate Fluctuation in Nigeria. International Journal of Economics, Business and Social Science Research, 3(1), 40-57.

Privara, A., Gohar, R., Alzoubi, H.M. et al. Exploring exchange rate sensitivity to crude oil futures: A study of selected global economies. Int Econ Policy 22, 5 (2025). https://doi.org/10.1007/s10368-024-00630-y

Zia, A., Ali, M. Z., Jamil, M. N., Mukhtar, Z., Yaqub, K. Q., & Javed, K. (2025). The Impact of Financial Monetary Economic Variables on Economic Growth. Kashf Journal of Multidisciplinary Research, 2(01), 1-18.https://doi.org/10.71146/kjmr185

IAATAREN, I. (2025). Exchange Rate Flexibility and Macroeconomic Stability: A Panel Data Modeling Approach. RMd• Economics, Management & Social Sciences, 2(1), e202511-e202511.https://doi.org/10.23882/emss25126

Babazadeh, V. (2025). The Impact of Exchange Rate Volatility on Economic Growth. UPA Strategic Affairs, 6(1), 126-148.

Hussain, S., Ali, R., Abdul Latiff, A. R., Fahlevi, M., Aljuaid, M., & Saniuk, S. (2024). Moderating effects of net export and exchange rate on profitability of firms: a two-step system generalized method of moments approach. Cogent Economics & Finance, 12(1), 2302638.https://doi.org/10.1080/23322039.2024.2302638

Audi, M. (2024). The impact of exchange rate volatility on long-term economic growth: Insights from Lebanon.

Jamil, M.N., Rasheed, A., Maqbool, A. et al. Cross-cultural study the macro variables and its impact on exchange rate regimes. Futur Bus J 9, 9 (2023). https://doi.org/10.1186/s43093-023-00189-1

Yang, H. C., Syarifuddin, F., Chang, C. P., & Wang, H. J. (2022). The impact of exchange rate futures fluctuations on macroeconomy: Evidence from ten trading market. Emerging Markets Finance and Trade, 58(8), 2300-2313. https://doi.org/10.1080/1540496X.2021.1976636

Iortyer, D. A., & Maji, A. (2022). Impact of selected macroeconomic drivers on the behavior of the Nigerian stock market. Journal of Economics and Allied Research, 7(1), 126-140.