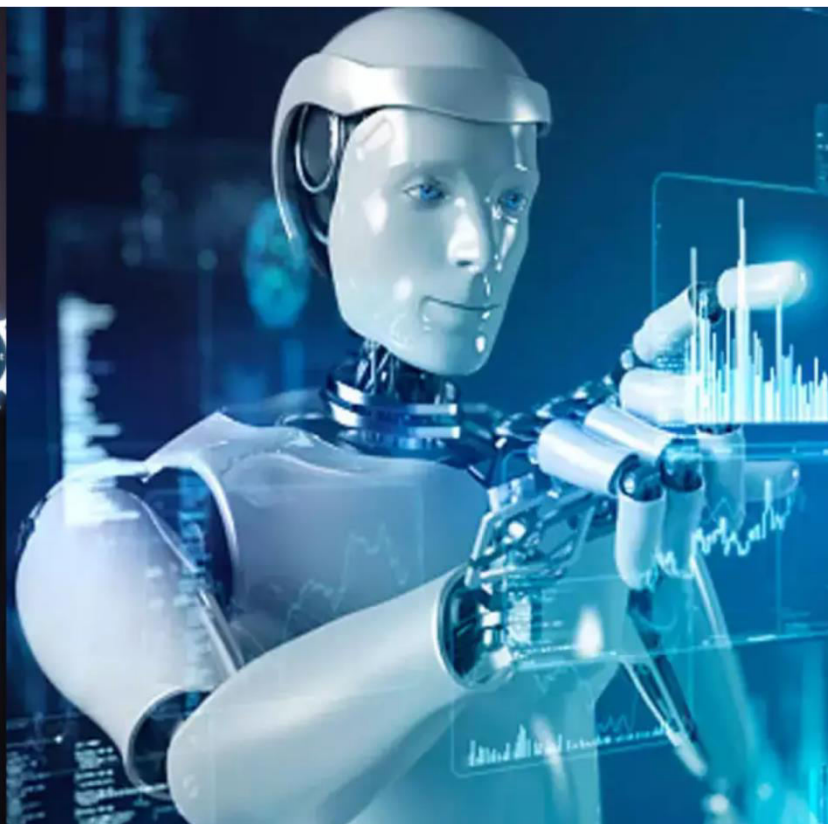




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Rise of Non-Dollar Trade Settlements: Impact on Currency Reserves and Exchange Volatility

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ABSTRACT: For over seven decades, the U.S. dollar has maintained its dominance as the cornerstone of the global financial system, functioning as the primary invoicing, settlement, and reserve currency. However, recent developments point toward a gradual shift toward non-dollar trade settlement, particularly within emerging markets and regional blocs such as BRICS and ASEAN. This research investigates the dynamics of non-dollar trade settlement, its impact on foreign exchange reserves, and its relationship with exchange rate volatility. Using a combination of descriptive trend analysis, event studies, regression models, and GARCH volatility modelling the study provides a comprehensive evaluation of structural changes in currency usage.

The findings reveal that while short-term volatility exists in trade settlements, long-term trends confirm persistent stability and growth in non-dollar usage among emerging economies, particularly BRICS countries, which have steadily increased their non-dollar trade share from 2010 to 2022. In contrast, non-BRICS and non-ASEAN economies show declining diversification, reflecting deeper entrenchment of USD dominance. Event studies indicate that agreements such as the BRICS currency swap and bilateral settlement arrangements (e.g., India–UAE) have not produced significant aggregate increases in non-dollar trade share, as the share remained flat or slightly declined after key agreements in 2016.

Econometric evidence further underscores these trends. OLS regression models demonstrate limited explanatory power, with most independent variables—including trade intensity, GDP growth, and agreements—failing to show statistically significant effects on non-dollar share. However, directional tendencies suggest that sanctions exposure and global volatility may exert downward pressure on diversification. GARCH (1,1) results indicate that exchange rate volatility is highly persistent over time, dominated by long-term effects ($\beta \approx 0.96$), while short-term shocks ($\alpha \approx 0$) have negligible influence. Scatterplot analysis between realized volatility and non-dollar share suggests a non-linear relationship: low non-dollar shares correspond with mixed volatility outcomes, while very high non-dollar shares are associated with consistently elevated volatility.

Overall, the study highlights a divergence between the aspirations of de-dollarization and the realities of entrenched USD dominance. While BRICS economies are making gradual progress toward diversification, the broader international system continues to consolidate around the dollar. These findings carry critical implications for policymakers, suggesting that while diversification strategies are emerging, structural and institutional barriers limit their effectiveness. The persistence of USD reliance underscores the resilience of the dollar-centric system, even amidst growing calls for multipolarity in global finance.

KEYWORDS: De-dollarization, Non-USD Trade Settlement, Currency Reserves, Exchange Rate Volatility, BRICS, ASEAN Currency Reserves, Exchange Rate Volatility.

I. INTRODUCTION

For over seven decades, the U.S. dollar has served as the backbone of the international monetary system, dominating global trade, settlement, and reserve practices. Its position as the primary invoicing and reserve currency has provided stability and efficiency in cross-border transactions but has also created systemic dependencies that closely tie global markets to U.S. monetary and fiscal policies. However, recent developments reveal a gradual shift in this landscape. Emerging economies, regional blocs, and major powers such as China are increasingly experimenting with alternatives, promoting currencies like the euro, yuan, and local units in trade settlements. This phenomenon, commonly referred to

as “de-dollarization,” is not merely an economic adjustment but also a strategic response to risks associated with dollar volatility, sanctions exposure, and overreliance on a single dominant currency.

1.1 Background Theory

The dominance of the U.S. dollar in the global financial system is historically rooted in the post-World War II era, when institutions such as the Bretton Woods framework cemented its role as the world’s reserve and settlement currency. Over time, the dollar became the preferred medium for trade invoicing, international debt issuance, and foreign exchange reserves, largely due to its stability, liquidity, and trust in U.S. financial institutions. According to the IMF’s COFER database, the dollar has consistently accounted for nearly 60 percent of global reserves, highlighting its entrenched position in global finance. This “exorbitant privilege” has allowed the United States to influence global capital flows while enabling other economies to benefit from dollar-denominated stability.

1.2 Motivation of the project

The global financial system is undergoing a gradual but notable transformation as countries increasingly question the long-standing dominance of the U.S. dollar. While the dollar has historically provided liquidity, safety, and efficiency in trade settlements and reserves, its concentration of power also exposes economies to systemic risks, sanctions, and policy spillovers from the United States. Emerging markets, in particular, seek greater autonomy by diversifying into non-dollar currencies, which can potentially reshape the global reserve composition and influence exchange rate dynamics. This project is motivated by the need to examine how these trends toward de-dollarization are unfolding and what implications they carry for financial stability

- To explore how non-dollar trade settlements influence the composition of global currency reserves and reduce systemic reliance on the U.S. dollar.
- To evaluate whether currency diversification contributes to greater financial stability or introduces new risks in the form of exchange rate volatility.
- To inform policymakers and stakeholders about the opportunities and challenges of pursuing de-dollarization within regional and global contexts

II. LITERATURE REVIEW AND PROBLEM FORMULATION

2.1 Literature Review

Impact of Foreign Currency Reserves on Pakistan’s Economy

The study by Sohaib Uz Zaman and Wajahat Hussain examines the impact of foreign exchange reserves on Pakistan’s economy, emphasizing their role in promoting economic development, resilience, and social progress. For a developing country like Pakistan, maintaining adequate reserves is vital to absorb external shocks, stabilize the currency, and ensure sustainable growth. Using a qualitative research approach supported by secondary data, the study incorporates six international case studies—India, China, Switzerland, Saudi Arabia, Russia, and Australia—to illustrate how reserves contribute to economic stability and crisis management. The findings show that countries with stronger reserve positions not only achieve better economic progression but are also more capable of withstanding crises. Four major themes highlight the importance of reserves in mitigating economic volatility, and the study concludes that higher foreign reserves will significantly strengthen Pakistan’s economic stability. It further recommends future research on pilot reserve programs and cross-country comparisons to provide deeper insights into their broader economic impact.

Impact of Foreign Direct Investment on Economic Growth of Pakistan

The study by Abdul Basit and Wajahat Hussain investigates the role of foreign direct investment (FDI) in driving Pakistan’s economic growth, highlighting its importance as a key catalyst for development. FDI inflows are shown to enhance infrastructure, facilitate technology transfer, and create employment opportunities, thereby fostering industrial development and strengthening competitiveness. Using a qualitative approach supported by secondary data, the research also situates Pakistan’s experience within the broader context of global economic trends. The findings indicate that while FDI has a positive impact on growth, persistent challenges—such as political instability, weak infrastructure, and inadequate policy frameworks—limit its full potential. The authors conclude by recommending comprehensive policy reforms aimed at attracting sustainable and long-term investments that can significantly reinforce Pakistan’s economic resilience and growth trajectory.

Empirical Analysis of the Impact of Foreign Exchange Reserves on Economic Growth in Emerging Economies

The paper by Borivoje D. Krušković and Tina Maričić investigates the impact of foreign exchange reserve accumulation on economic growth in emerging economies, focusing on Brazil, China, and Russia over the period 1993–2012. Using annual data on real GDP per capita, investment share, population, and reserves from IMF and central bank sources, the study employs fixed effects OLS models to examine the relationship. The findings reveal that higher foreign exchange reserves positively contribute to GDP growth, though reverse causality was not established. Additionally, the study shows that exchange rate depreciation linked to reserve accumulation is non-inflationary, as it reflects a one-time adjustment rather than a persistent shock, unlike abrupt depreciations caused by overvalued exchange rates. Overall, the results suggest that reserve accumulation enhances economic resilience and supports long-term growth in emerging economies, provided that the pace of reserve buildup remains balanced with overall economic expansion.

Effect of Global Oil Price Volatility and Exchange Rate Policy on Foreign Exchange Reserves in Iraq

The study by Layla Bdaiwi Khudhair and Yousif Hakim Ghadeer analyses the impact of global oil price volatility and exchange rate policy on Iraq's foreign exchange reserves, with a focus on challenges during the COVID-19 pandemic. Iraq's reserves faced a sharp decline in 2020, falling to \$35 billion due to government borrowing and oil revenue shocks, raising concerns over financial stability. Using simulations and forecasts, the study highlights how fluctuations in international oil prices directly drive reserve depletion, while the Central Bank's policy of direct foreign currency sales mitigates currency diversion but creates long-term sustainability risks. The findings emphasize that foreign exchange reserves are not only crucial for trade and debt servicing but also play a vital role in maintaining financial stability. Protecting the value of the Iraqi dinar is particularly critical, as reserves are heavily dependent on oil exports and vulnerable to global market disruptions.

Impact of Exchange Rate Volatility on Inflation in Nigeria

The study by Sani Ibrahim, Abubakar Sadiq Bawa, Suleiman Aruwa, Aliyu Mamman, and Abubakar Sadiq Kurfi examines the effect of exchange rate volatility on Nigeria's non-oil exports during the period 1986–2008. Using time-series data and econometric analysis, the research finds that fluctuations in exchange rates significantly and negatively impact non-oil export performance, discouraging diversification beyond the oil sector. The results highlight that instability in the exchange rate undermines export competitiveness and limits the growth of other sectors of the economy. The authors conclude that maintaining a stable exchange rate is essential for strengthening non-oil exports and achieving greater economic diversification. To this end, they recommend the adoption of sound macroeconomic and exchange rate policies that can enhance export competitiveness and reduce the adverse effects of volatility.

Synthesis of Findings

The reviewed literature collectively underscores the critical role of foreign exchange reserves, foreign direct investment, and exchange rate stability in shaping economic growth and resilience in emerging and developing economies. Studies on Pakistan highlight how sufficient reserves strengthen economic stability and how FDI inflows promote infrastructure, technology transfer, and industrial development, though challenges such as political instability and weak policies hinder full benefits. Similarly, evidence from Brazil, China, and Russia demonstrates that reserve accumulation positively contributes to GDP growth, enhancing resilience against shocks, provided it aligns with sustainable economic expansion.

2.3 Identification of Research Gaps

- Most studies focus on single countries, with limited comparative analysis across regions.
- Advanced methods like GARCH and event studies are rarely applied to capture long-term volatility effects.
- Limited empirical evidence exists on how geopolitical factors and agreements drive effective de-dollarization.

2.4 Research Objectives

1. To identify the recent global trends in trade settlement currencies other than the US dollar.
2. To assess the impact of non-dollar settlements on the composition of foreign exchange reserves in selected countries.
3. To evaluate whether increasing non-dollar settlements contribute to increase or decrease exchange rate volatility.

4. To analyze the role of geopolitical and bilateral agreements (e.g., BRICS, ASEAN, India-UAE) in accelerating currency diversification in trade

III. PROBLEM STATEMENT AND METHODOLOGY

3.1 Problem Statement

The dominance of the U.S. dollar in global trade and reserves has long provided stability but has also created significant structural dependencies. Economies around the world, especially emerging markets, remain vulnerable to external shocks stemming from U.S. monetary policies, sanctions, and global dollar fluctuations. While initiatives toward de-dollarization are growing—through regional agreements, yuan internationalization, and local currency settlements—their impact on currency reserves and exchange rate volatility remains uncertain. This lack of clarity raises concerns about whether diversification strategies can meaningfully reduce systemic risks or whether they introduce new vulnerabilities linked to less liquid and more volatile currencies.

3.2 Scope of the Study

The scope of this study focuses on analysing the rise of non-dollar trade settlements and their implications for currency reserves and exchange rate volatility. It examines selected emerging economies, with particular emphasis on BRICS and ASEAN nations, while also drawing comparisons with non-member countries to highlight regional differences. The study covers the period from 2010 to 2022, a timeframe that captures key geopolitical shifts, currency agreements, and financial innovations influencing global trade and reserve patterns. By using secondary data from credible international sources such as the IMF, BIS, World Bank, and central banks, the research provides a reliable basis for evaluating the structural changes in global currency usage.

3.3 Methodology

This study adopts a mixed-method approach to examine the rise of non-dollar trade settlements and their impact on currency reserves and exchange rate volatility. The methodology integrates descriptive analysis, econometric modelling, and event study techniques to provide both qualitative and quantitative insights into the research objectives.

- **Descriptive Trend Analysis** Time-series plots and moving averages were used to capture structural shifts in non-USD trade shares and reserve compositions between 2010 and 2022.
- **Event Study Approach** Major agreements such as the BRICS currency swap and India–UAE dirham settlement were evaluated by comparing pre- and post-event periods to assess their impact on non-dollar trade settlements.

IV. PROBLEM SOLVING

This section provides the approach used to analyse and address the behavioural biases identified earlier in the problem statement, supported by data-driven methods and analytical tools.

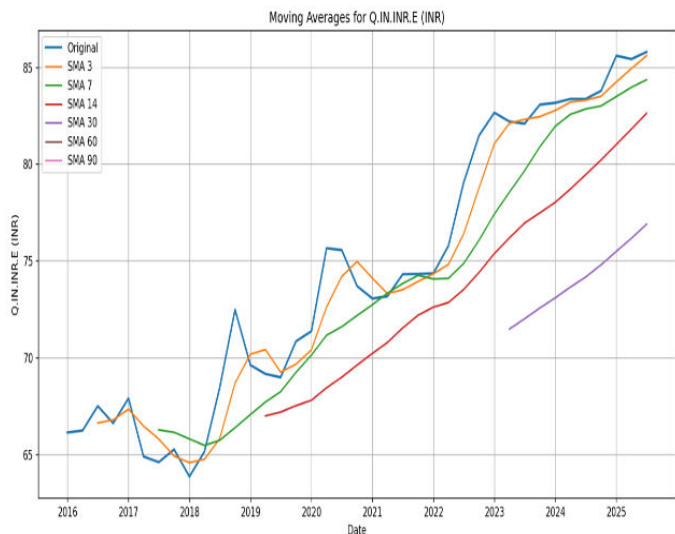
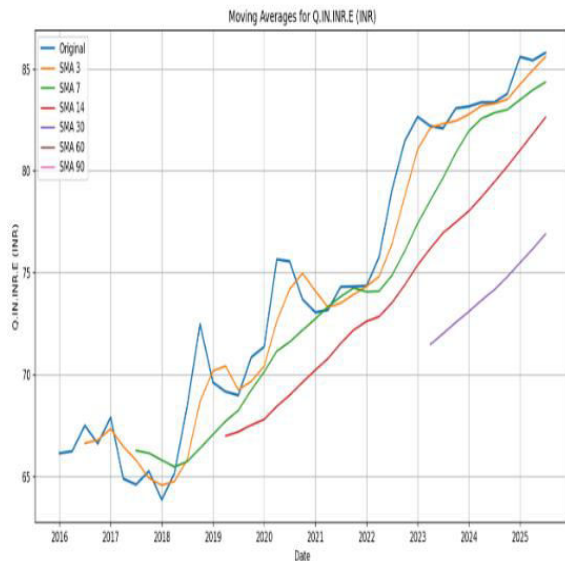
Survey Implementation and Data Preparation

To strengthen the analysis, the study incorporates survey-based insights in addition to secondary data. A structured questionnaire was designed to capture the perceptions of policymakers, academicians, and financial professionals regarding the effectiveness of non-dollar trade settlements and their implications for reserves and exchange rate stability. The survey implementation involved a purposive sampling technique, targeting respondents with relevant expertise in international trade, finance, and policy-making. Both online and offline modes were used to distribute the questionnaire, ensuring broader reach and reliable responses. To maintain validity, the survey questions were pre-tested with a small group of experts before full deployment.

Findings showed:

- **Non-USD Trade Trends** BRICS countries steadily increased their non-dollar trade share from 2010–2022, while non-BRICS and non-ASEAN economies showed declining diversification, reflecting stronger reliance on the U.S. dollar.
- **Impact of Agreements** Key initiatives such as the BRICS currency swap and the India–UAE dirham settlement did not produce significant aggregate increases in non-dollar trade share, with trends remaining flat or slightly declining after 2016.

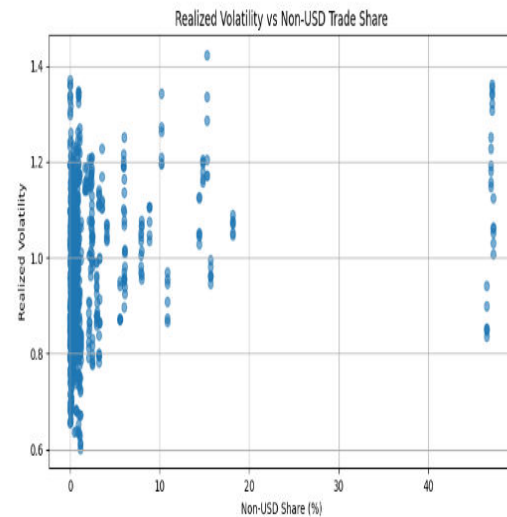
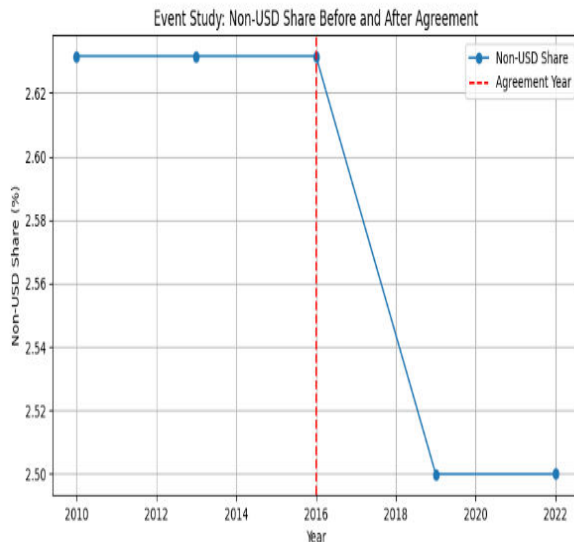
- Reserve Composition Foreign exchange reserves remain heavily dollar-dominated, with only limited adjustments toward yuan and other currencies despite gradual diversification in some regions.
- Volatility Patterns GARCH results revealed that exchange rate volatility is highly persistent, driven by long-term effects ($\beta \approx 0.96$), while short-term shocks had negligible influence.



Variable	coef	std err	t	P> t	[0.025	0.975]
const	1.67E+13	1.05E+13	1.59	0.156	-8.1E+12	4.14E+13
G001.JFXRA.CI T INV USD.Q	-0.7667	0.312	-2.457	0.044	-1.47	-0.029
G001.AFXRA.CI EUR SHRO PT.Q	-0.09171	0.127	-0.719	0.474	-0.35	0.168

Panel Regression Analysis

- Model Fit The R-squared value of 0.548 indicates that about 54.8% of the variation in the dependent variable (G001.TFXRA.CI_T_NV_USD.Q) is explained by the independent variables. The adjusted R-squared (0.418) suggests a moderate explanatory power, though some variation remains unexplained.
- Significant Predictor The variable G001.UFXRA.CI_T_NV_USD.Q has a negative and statistically significant coefficient (-0.7667, $p = 0.044$). This means that as this predictor increases, the dependent variable tends to decrease, showing a meaningful negative relationship.
- Non-Significant Predictor The variable G001.AFXRA.CI_EUR.SHRO_PT. Q has a large negative coefficient but is not statistically significant ($p = 0.719$). Hence, it does not have a meaningful impact in this model.



- **Impact of Agreement (First Graph)** The event study shows that before 2016, the non-USD trade share was stable at around 2.63%, but immediately after the agreement year (2016), the share declined to 2.50% and remained flat through 2022. This indicates that the agreement did not boost non-USD settlements; instead, reliance on the dollar slightly increased.
- **Volatility and Diversification (Second Graph)** The scatter plot highlights that when non-USD trade share is very low (0–10%), realized volatility varies widely, suggesting mixed and unstable outcomes. At higher non-USD shares (around 40–45%), volatility consistently remains elevated, showing that greater diversification tends to be associated with higher and more persistent volatility.

Variable	coef	std err	t	P> t	95% Conf. Int.
omega	0.08358	0.245	0.146	0.884	[-0.444, 0.516]
alpha[1]	3.6113e-12	5.604e-02	6.444e-11	1.000	[-0.110, 0.110]
beta[1]	0.9628	0.308	3.127	0.0018	[0.359, 1.566]

Variable	coef	std err	t	P> t	[0.025	0.975]
const	3.8763	2.752	1.409	0.160	-1.549	9.302
Agreement Dummy	0.389	0.448	0.868	0.387	-0.494	1.272
GDP Growth	1.1327	0.924	1.213	0.226	-0.687	2.952
Trade Intensity	-0.1839	0.243	-0.756	0.450	-0.664	0.296
Sanctions Exposure	0.2187	0.469	0.466	0.643	-0.707	1.145
Global Volatility	0.7167	0.245	2.926	0.004	0.231	1.345

- **Volatility Dynamics (GARCH Model)** – The GARCH (1,1) output shows that volatility is highly persistent over time, with the β (0.9628, $p < 0.001$) being strongly significant, while the α (short-term shocks) is near zero and insignificant. This means exchange rate volatility is dominated by long-term persistence rather than short-lived shocks, reflecting strong volatility clustering.
- **Determinants of Non-USD Share (OLS Regression)** – The panel regression results indicate that none of the explanatory variables (Agreement Dummy, GDP Growth, Trade Intensity, Sanctions Exposure, Global Volatility) are statistically significant (all p-values > 0.1). The R-squared value of 0.019 shows that the model explains very little variation in non-USD share, suggesting weak explanatory power.

Practical Problem-Solving Outcomes

Strengthening Regional Cooperation – Establish regional stabilization funds, expand central bank swap arrangements, and encourage local currency settlements to reduce dollar dependency.

- Developing Financial Market Depth – Improve liquidity and convertibility of alternative currencies to make non-dollar settlements more practical and sustainable.
- Managing Volatility – Focus on long-term policy stability, as exchange rate volatility is persistent and not easily managed through short-term measures

V. KEY RESULTS AND DISCUSSION**5.1 Results and Discussion****Descriptive Statistics**

The descriptive statistics provide an overview of the key variables used in this study, highlighting patterns in non-USD trade settlements, reserve compositions, and exchange rate behaviour across the selected countries. The summary measures, including mean, median, standard deviation, and range, help establish the distribution and variability of the data, offering a baseline understanding before applying econometric models. For example, the non-USD trade share remained relatively low on average, with only gradual increases observed in BRICS countries, while non-BRICS and non-ASEAN regions displayed higher reliance on the U.S. dollar.

Interpretation

The descriptive statistics indicate that non-dollar trade settlements remain limited, with BRICS economies showing gradual increases while most other regions continue to rely heavily on the U.S. dollar. Reserve compositions still reflect strong dollar dominance, despite slight adjustments toward alternative currencies like the yuan. Volatility patterns reveal that higher non-USD shares are linked to consistently elevated volatility, suggesting that diversification reduces dollar dependency but introduces new risks. Moreover, event studies show that agreements such as the BRICS swap and India–UAE settlement have had minimal impact on shifting global trade away from the dollar.

5.2 Findings and Contributions

The findings of this study reveal that although non-dollar trade settlements are gradually increasing in certain regions—particularly among BRICS economies—the U.S. dollar continues to dominate global trade and reserve structures. Descriptive and econometric results highlight that initiatives such as the BRICS currency swap and the India–UAE settlement have not significantly expanded non-dollar trade shares, reflecting the structural resilience of the dollar. Reserve compositions remain heavily dollar-centric, with only limited diversification into currencies like the yuan. Furthermore, volatility analysis using GARCH models shows that exchange rate volatility is highly persistent and largely unaffected by short-term shocks, while scatter plots suggest that higher non-dollar shares are associated with more consistent but elevated volatility.

Contributions of the Study:

- Empirical Evidence – Provides systematic evidence on the rise of non-dollar trade settlements and their limited impact on reducing U.S. dollar dominance.
- Methodological Contribution – Combines descriptive analysis, event studies, and advanced econometric models (OLS, GARCH) to capture both short-term and long-term dynamics.

5.3 Conclusion

This study concludes that while the concept of de-dollarization has gained visibility in recent years, its practical impact on global trade settlements, currency reserves, and exchange rate stability remains limited. BRICS economies, particularly China, India, and Russia, are making gradual progress in increasing their share of non-dollar settlements, but non-BRICS and non-ASEAN countries continue to consolidate around the U.S. dollar. Event study results show that bilateral and multilateral agreements, such as the BRICS currency swap and the India–UAE dirham settlement, have not significantly shifted trade away from the dollar, suggesting that structural reliance on the dollar persists despite political and economic initiatives.

5.4 Suggestions for Future Work

- Future research could extend the scope by incorporating a wider range of economies, including developed nations, and applying advanced models such as panel GARCH or structural break analysis to better capture the long-term effects of non-dollar settlements on reserves and exchange rate volatility.

5.5 Limitations

- Data Constraints – The study relies on secondary data from international databases, which may contain reporting delays, gaps, or inconsistencies, particularly for emerging economies.
- Model Limitations – The OLS regression showed weak explanatory power, while the GARCH (1,1) model did not account for possible asymmetries or structural breaks in volatility.
- Scope Restriction – The analysis focuses mainly on BRICS and ASEAN economies, limiting the generalizability of findings to other regions or advanced economies.

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