NAVIGATING ECONOMIC TURBULENCE: EXCHANGE RATE VOLATILITY AND MACROECONOMIC RESILIENCE IN OPEN ECONOMIES

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ABSTRACT

Exchange rate volatility significantly impacts developing countries' macroeconomic stability in the global economy. This study investigates the effects of exchange rate fluctuations on key macroeconomic indicators, focusing on Indonesia. Using a qualitative descriptive approach with secondary data from institutional sources and an OLS regression analysis, the research examines the challenges faced by developing nations. Findings reveal that exchange rate volatility substantially influences inflation, economic growth, foreign exchange reserves, and the balance of payments. The Indonesian case study (2013, 2018, and 2022–2023) demonstrates that external factors, particularly global monetary policy changes and geopolitical tensions, primarily drive exchange rate pressures. Short-term policy responses, including adjustments to the BI-7 Day Reverse Repo Rate and foreign exchange market interventions, have proven effective for immediate stability. However, long-term macroeconomic resilience necessitates comprehensive strategies such as economic diversification, institutional strengthening, and sustained policy coordination to mitigate the impacts of exchange rate volatility in developing countries

INTRODUCTION

In the context of an increasingly open and globally interconnected modern economic system, exchange rate stability has emerged as a critical factor in sustaining macroeconomic resilience, particularly in developing nations. The exchange rate is instrumental in determining export competitiveness, burden of foreign debt, and international market confidence in a nation's economy. However, exchange rates are inherently susceptible to global dynamics, including interest rate fluctuations, geopolitical tensions, and commodity price variations, leading to frequent

fluctuations and high volatility (Arafat A. et al., 2024; Puspitasari, 2024). As noted by Aftab et al. (2024), exchange rate volatility not only elevates the risk associated with international transactions and production costs but also has the potential to diminish investment and consumption levels, thereby increasing unemployment, especially in countries with significant exposure to foreign currency debt. The study further underscores that economic policy uncertainty, encompassing monetary policy and global financial market fluctuations, significantly exacerbates exchange rate volatility in both the short and long term.

This complexity is further compounded by the uncertainty surrounding global economic policies. Since the dissolution of the Bretton Woods system in 1973 and the subsequent adoption of a floating exchange rate system, currency fluctuations have become unavoidable. Bahmani-Oskooee & Hegerty (2007) highlight that since the implementation of the floating exchange rate system, numerous empirical studies have yielded varied results regarding the impact of exchange rate volatility on international trade, inflation, and growth. Some studies have concluded a negative impact, while others have found positive or even negligible effects. This indicates that exchange rate volatility is not merely a numerical issue but is intricately linked to the economic structure, financial system, and policy responses of each country (Bahmani-Oskooee & Hegerty, 2007). In the Indonesian context, as a nation with an open economy and an export base still relies on commodities, the volatility of the rupiah exchange rate remains a persistent challenge. Exchange rate fluctuations directly affect import costs, inflation of consumer goods, and trade and payment balances. Bank Indonesia actively employs monetary policy instruments such as the BI-7DRRR and foreign exchange market interventions to maintain stability, yet external pressures such as global interest rate changes or geopolitical crises remain significant sources of volatility. As elucidated by Sheykhi et al. (2025), empirical estimates generally indicate that exchange rate volatility has a significant negative correlation with economic growth in developing countries, as it creates investment uncertainty and reduces export competitiveness. Furthermore, Rastogi & Kanoujiya (2024) demonstrate that exchange rate volatility can spill over into domestic price sectors, resulting in imported inflation that exacerbates price stability, particularly in economic systems heavily reliant on imported consumer goods. This aligns with the World Bank's perspective that unstable exchange rates can undermine fiscal resilience and weaken the credibility of a country's economic policies.

The depreciation of the rupiah exchange rate against the US dollar during the periods of 2013, 2018, and 2022–2023 shows a quite significant weakening trend that has impacted domestic inflationary pressures. In 2013, the rupiah depreciated approximately 11% year-to-date, even reaching 26% throughout the year due to taper tantrum sentiment. In 2018, depreciation was recorded at around 11% alongside increasing external pressures, such as US monetary policy normalization. Meanwhile, during the 2022–2023 period, the rupiah exchange rate experienced cumulative weakening of approximately 18–20%, triggered by global uncertainty and surging Fed interest rates. Based on empirical studies, every 10% exchange rate depreciation has the potential to drive inflation by 1–2%, depending on economic structure and monetary policy response. Thus, the contribution of depreciation to inflation in 2013 is estimated to have reached 3–5%, in 2018 around 1.5–2%, and in 2022–2023 ranging between 4–6%. This impact is most felt in imported goods components, energy, and industrial raw materials that have rapid pass-through to consumer prices, making depreciation one of the important factors influencing inflation dynamics in Indonesia.

Conversely, not all exchange rate volatilities have adverse effects. Certain theoretical frameworks suggest that such volatility may incentivize business entities to adapt their strategies to market diversification or fortification of the domestic market, particularly when supported by hedging instruments and a well-developed financial market. As elucidated in the meta-analysis by Bahmani-Oskooee & Hegerty (2007), the impact of volatility on trade can vary based on the sector, trading partners, and a nation's institutional capacity to absorb and respond to shocks. Against this backdrop, this study investigates exchange rate volatility and the challenges faced by an open economy in sustaining

macroeconomic resilience by employing a descriptive qualitative methodology. This study examines exchange rate phenomena from both theoretical and empirical perspectives over the past decade, drawing on pertinent scientific sources. The analysis focuses on (1) the primary causes of exchange rate fluctuations in developing countries, and (2) the implications of these fluctuations for macroeconomic resilience in the context of economic openness. The findings of this study are expected to offer both academic and practical contributions, particularly in formulating strategies to bolster the economy against future external shocks.

LITERATURE REVIEW

Concepts and theories of exchange rate volatility

The exchange rate is the price at which one currency can be exchanged for another, acting as a key mechanism in international trade and finance. Exchange rate systems, including fixed, floating, and managed floating, offer different approaches to currency management. A fixed exchange rate pegs a currency to another major currency or basket, providing stability but limiting flexibility. A floating system allows market forces to dictate currency value, while a managed floating system represents a middle ground with government interventions when necessary (Sarno & Taylor, 2003). Factors influencing exchange rates include interest rates, inflation rates, political stability, economic performance, and foreign exchange reserves. Higher interest rates attract foreign capital, potentially raising exchange rates, while inflation can devalue currency. Political stability and strong economic performance can increase investor confidence, leading to currency appreciation (Nowak et al., 2004). Exchange rate volatility can be mitigated by maintaining adequate foreign reserves (Canzoneri et al., 2001). Exchange rate volatility impacts both developed and developing economies, measured using statistical methods like standard deviation and z-score (Morina et al., 2020). Causes include macroeconomic fundamentals, speculative activities, political instability, and market sentiments. Local currency pricing and incomplete international financial markets contribute to volatility, along with stochastic deviations from uncovered interest rate parity (Devereux & Engel, 2002). Exchange rate volatility affects international trade and economic growth, deterring businesses from international transactions (Arize, 1998). In Central and Eastern European countries, empirical findings show exchange rate volatility negatively influences real economic growth, suggesting policymakers should stabilize exchange rates (Morina et al., 2020).

Economic openness

Economic openness refers to the degree to which a country allows the flow of goods, services, capital, and labor across its borders. It is often measured using indicators such as trade openness, investment openness, and the level of restrictions on foreign exchange transactions. Trade openness is a key indicator and is typically measured as the ratio of a country's total trade (exports plus imports) to its gross domestic product (GDP) (Hau, 2002).

The benefits of economic openness include increased efficiency, access to larger markets for domestic producers, greater competition, and access to foreign investments and technologies. This openness can lead to higher economic growth by allowing countries to specialize in industries where they have a comparative advantage, thereby enhancing productivity and innovation (Mireku et al., 2020). However, economic openness also carries risks, such as increased exposure to global economic fluctuations, potential loss of domestic industries to foreign competition, and heightened vulnerability to economic crises originating from other countries (Dal Bianco & Loan, 2017).

Economic openness can significantly affect exchange rate volatility. A more open economy might experience smaller real exchange rate movements in response to external shocks because of its enhanced ability to absorb and adjust to foreign economic influences (Hau, 2002). Conversely, in some cases, high trade openness may lead to

increased exchange rate volatility if external economic conditions change rapidly or unexpectedly, potentially affecting economic stability (Nguyen et al., 2023).

Extreme fluctuations in exchange rates can negatively impact economic growth and investment, as observed in studies that focus on different regions. For example, exchange rate volatility has a negative impact on economic growth in regions such as Central and Eastern Europe and negatively affects foreign direct investment in places like Latin America (Dal Bianco & Loan, 2017; Morina et al., 2020). These mixed impacts highlight the complex interplay between economic openness and exchange rate volatility, suggesting that countries must carefully manage their policies to balance openness with economic stability (Barguellil et al., 2018).

Macroeconomic resilience

Macroeconomic resilience is a multifaceted concept that encompasses an economy's ability to withstand, recover and adapt to external shocks. It involves both instantaneous resilience, which limits immediate losses after a shock, and dynamic resilience, which focuses on recovery and rebuilding of capabilities. The concept extends beyond mere economic indicators and incorporates factors such as governance, social development, and market efficiency. Resilience is measured using various indicators, including macroeconomic stability, microeconomic market efficiency, and good governance, which collectively form a resilience index that can guide policy decisions. Factors that influence economic resilience are diverse and interconnected. Economic infrastructure, governance, and political stability play crucial roles, with diversified economic structures providing buffers against shocks. Psychological factors, such as regional emotional stability and entrepreneurial characteristics, also contribute to resilience by mitigating economic slowdowns during crises. Other important factors include logistics, infrastructure, economic complexity, foreign trade dependency, and human capital. Developing countries face unique challenges in building economic resilience, often due to their economic openness and reliance on foreign direct investment and exports to higher-income markets. These vulnerabilities necessitate a balanced policy approach that focuses on industrialization, regional trade development, and strengthening local supply and value chains. Robust supranational institutions and financial inclusion are critical for enhancing overall economic resilience, particularly in developing regions.

Monetary policy and exchange rate

Central banks manage exchange rates through monetary policy instruments to influence currency values and stabilize economies. They intervene in foreign exchange markets to prevent rate fluctuations and control inflation, accumulating foreign reserves to enable interventions without compromising reserve levels (Krušković, 2022). In emerging markets, central banks face challenges like liability dollarization and capital flow disruptions, acting as lenders of last resort by using reserves to stabilize credit markets and prevent exchange rate volatility. This includes interventions or temporary rate pegging to maintain stability (Calvo, 2006). Policy instruments include foreign exchange interventions, interest rate adjustments, and balance sheet changes. Central banks influence markets through transparent communication of policy intentions (Friedman & Kuttner, 2010). Intervention effectiveness depends on market conditions and transparency. While studies show interventions are effective in up to 80% of cases, success rates can be lower under adverse conditions, as demonstrated by the Bank of England's 8% success rate (Naef, 2024). Federal Reserve interventions decrease volatility over time, while secret interventions increase it, emphasizing transparency's importance (Dominguez, 1993). Manage exchange rates and effectively implement monetary policy. The success of these efforts is contingent on the specific economic context, transparency of actions, and coordination between monetary policy and foreign exchange interventions.

Open economy theory

Open economy theory, through the Mundell-Fleming model, explains how economies interact in international trade and finance. The model elucidates policy constraints in open economies through the monetary policy trilemma. As an extension of the IS-LM model, it integrates international trade and capital flows, highlighting the impossibility of simultaneously achieving monetary independence, exchange rate stability, and capital mobility (Frenkel & Razin, 1987). The trilemma requires countries to choose only two of these policies: fixed exchange rates, free capital movement, or independent monetary policy. This becomes evident with increased financial integration, as demonstrated in India's case, where monetary policy independence was limited while maintaining exchange rate stability (Hutchison et al., 2012). The Mundell-Fleming framework suggests exchange rate flexibility and monetary policy can insulate against external shocks, though real-world conditions require unconventional policies like foreign exchange interventions (Basu et al., 2020). The global financial cycle creates additional challenges, as U.S. monetary policy shocks affect financial conditions globally, questioning the trilemma's validity in current financial markets (Rey, 2016). The theory thus demonstrates the complexity of managing economic policies in an interconnected world, requiring careful balance of policy tools.

Economic diversification

Economic diversification enhances macroeconomic stability and promotes structural transformation across development sectors (Jolo et al., 2022). It involves shifting from narrow economic activities to broader industries through productive capacities, innovation, and infrastructure development (Jolo et al., 2022). Countries can diversify by developing high-tech industries beyond agriculture and extractive sectors (Carrasco & Tovar-García, 2021). Livelihood diversification helps manage economic shocks and mitigate rural poverty (Habib et al., 2023). Countries dependent on single exports are vulnerable to market fluctuations, while diversified economies better absorb external shocks (Pretorius et al., 2021). In developing nations, economic diversification reduces commodity price volatility (Barrot et al., 2018) and ensures stable growth (Löscher & Kaltenbrunner, 2023). Economic policy coordination between fiscal and monetary policies is essential for macroeconomic stability. This coordination creates conditions where fiscal measures and monetary conditions support sustainable growth, balancing budgets and regulating monetary policies to impact aggregate demand (Chugunov et al., 2021). In economic unions like the EMU, harmonizing national fiscal policies with unified monetary policy prevents inefficiencies. The EMU requires monetary policy to stabilize prices while national fiscal policies distribute demand. Current mechanisms focus on long-term coordination but neglect short-run interdependencies (Von Hagen et al., 2002). Globalization has intensified policy coordination challenges, affecting international tax policies and capital flows. This requires understanding international tax systems and their impact on multinational decisions (Razin & Slemrod, 2008). While globalization affects monetary policy transmission, domestic policies can still stabilize inflation and output (Woodford & Muscatelli, 2007). Effective economic policy coordination requires aligned fiscal and monetary policies. International coordination mechanisms must address distributional inefficiencies, while globalization necessitates greater collaboration in policy planning.

METHODS

This study employs a comprehensive qualitative-descriptive research design to investigate the complex relationship between exchange rate volatility and macroeconomic resilience in developing countries, with particular emphasis on Indonesia over the past decade. This research uses a qualitative descriptive design combined with a limited quantitative approach through simple linear regression testing (Ordinary Least Squares/OLS). The purpose of

this approach is to examine the phenomenon of exchange rate volatility and macroeconomic resilience in developing countries, particularly Indonesia, by utilizing secondary data from both national and international institutions. Utilizing secondary data sources and relevant academic literature, this study aims to provide a thorough analysis of economic phenomena based on empirical evidence and policy documentation. The methodological approach integrates content analysis and descriptive thematic analysis, facilitating a critical examination of official reports from national and international economic institutions, as well as the categorization and interpretation of relationships between exchange rate volatility and various aspects of macroeconomic resilience.

This research draws upon a diverse array of data sources, including macroeconomic statistics from Bank Indonesia, the Central Bureau of Statistics, and the World Bank, as well as findings from international academic journals. Visual representations, such as graphs depicting historical rupiah exchange rate movements, are incorporated to contextualize exchange rate dynamics. Furthermore, the study employs simple linear regression tests using the E-Views application to illustrate the relationship between exchange rates and inflation in Indonesia.

The analysis is conducted in two phases: first, identifying patterns of exchange rate fluctuation within the context of global changes and examining Indonesia's policy responses; and second, analyzing various indicators of macroeconomic resilience in relation to exchange rate pressures. Case studies from specific periods (2013, 2018, and 2022-2023) were utilized to demonstrate the effectiveness of responsive policies in maintaining short-term stability while preserving long-term economic resilience.
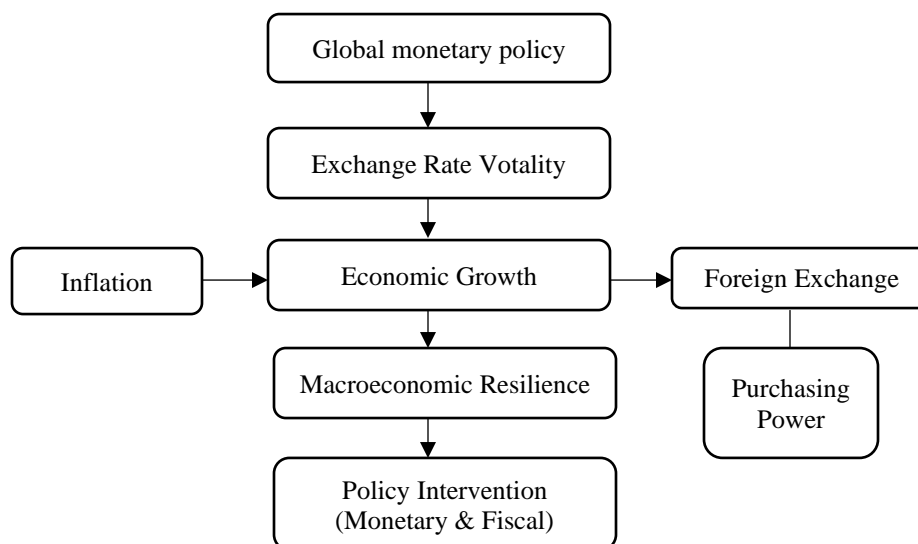

Figure 1. Conceptual Model

Figure 1 illustrates the conceptual model of the relationship between exchange rate volatility and macroeconomic resilience. External factors such as global monetary policy trigger exchange rate fluctuations that impact inflation, economic growth, and foreign exchange reserves. Macroeconomic resilience is influenced by the interaction of these variables, with policy interventions (monetary and fiscal) serving as the main buffer against

external pressures. This model serves as a reference in analyzing the empirical dynamics and qualitative narrative of the research.

RESULTS AND DISCUSSION
The Concept of Exchange Rate Volatility

Exchange rate volatility refers to sudden changes in a country's currency value compared to others, a phenomenon common in developing countries with weaker financial systems and heavy reliance on exports and foreign money. Studies indicate that exchange rates in these countries fluctuate more than those in developed countries (Agosin & Díaz, 2023). Both internal and external factors contribute to volatility. Internal causes include balance of payments deficits, where countries such as Indonesia and Bangladesh experience unstable exchange rates when they spend more on imports than they earn from exports (Lee-Lee & Hui-Boon, 2007). Domestic inflation also plays a role because high inflation lowers buying power and causes currency devaluation. In Southern Africa, a strong link exists between unstable exchange rates, inflation, and slow economic growth (Olamide et al., 2022). Uncompetitive interest rates can lead to capital outflow, causing currency depreciation and negatively affecting exchange rates and growth (Bahmani-Oskooee & Hegerty, 2007). External causes encompass global monetary policy changes, such as rising US interest rates, which can lead to capital flight from developing countries and weaken their currencies (Matschke et al., 2023). Geopolitical tensions and global crises prompt investors to seek safer assets and increase currency instability (Barus et al., 2024). Commodity price fluctuations affect countries dependent on exports such as oil, coal, or palm oil, with research showing that one third of India's imports are sensitive to exchange rate changes (Gupta & Varshney, 2023). Finally, international capital flows, particularly sudden changes in short-term investments, impact the currencies of developing countries, as studies in Africa demonstrate the influence of global market conditions on currency stability in countries such as Uganda and Ghana (Chen, 2022).

These factors collectively contribute to the complex and often unpredictable nature of the exchange rate dynamics in developing economies. Policymakers in these countries face significant challenges in managing currency stability while balancing their economic growth objectives. Effective strategies to mitigate exchange rate volatility include diversifying export markets, strengthening financial institutions, and implementing prudent fiscal and monetary policies. These measures can help developing countries build resilience to both internal and external shocks that affect their currency values. Additionally, fostering regional economic cooperation and integration can provide a buffer against global economic fluctuations and reduce the vulnerability of individual currencies to external pressures.

Challenges of an Open Economy in Facing Exchange Rate Volatility

Developing countries with open economic systems face significant challenges when exchange rates experience high levels of volatility. In this context, economic openness characterized by high levels of international trade and cross-border capital mobility, has become the main channel for the transmission of external shocks into the domestic economy. Exchange rate volatility not only creates uncertainty in trade but also complicates the management of monetary policy, fiscal policy, and overall macroeconomic stability.

Countries with high degrees of trade openness are highly vulnerable to exchange rate fluctuations. When exchange rates are volatile, export prices become uncompetitive and import costs surge, leading to pressure on trade balance. Sheykhi et al. (2025) emphasize that exchange rate volatility can reduce trade volumes and create investment uncertainty, especially in sectors that depend heavily on imported inputs or external demand.

Reliance on international capital flows, particularly portfolio investments, increases the risk of sudden capital reversals. When foreign investors withdraw their funds due to changes in global interest rates or shifts in risk

sentiment, the pressure on the exchange rate becomes very sharp and often uncontrollable. Aftab et al. (2024) note that dependence on short-term capital puts developing countries in a weak position when facing changes in the global cycle.

The degree of sensitivity of developing countries to global changes such as the Federal Reserve's interest rates, world oil prices, and geopolitical conditions, is extremely high. This is due to limited foreign exchange reserves, which means a weak capacity to intervene in the currency market; an undiversified export composition, usually depending on only one or two main commodities; and the dominance of foreign currency-denominated debt, which means that exchange rate depreciation directly increases the foreign debt burden.

Rastogi and Kanoujiya (2024) note that under such conditions, exchange rate turmoil is not only a matter of nominal numbers but can also spill over to price levels, investor confidence, and broader political stability. As a case study, Indonesia, a developing country with an open economy, has experienced several episodes of exchange rate pressure, for example in 2013 (taper tantrum), 2018, and 2022–2023. During these periods, the depreciation of the rupiah led to a surge in import costs, pressure on core inflation, and adjustments to Bank Indonesia's benchmark interest rate policy.
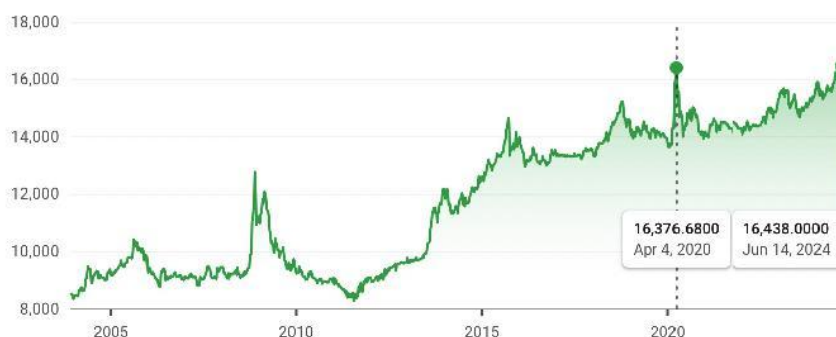

Figure 2. Chart of Rupiah Movement Against the US Dollar 2005–2024

From the graph in figure 2, it is evident that although the rupiah exchange rate continues to show a tendency to weaken in the long term (a common characteristic of developing countries' currencies), external factors such as global monetary policy and geopolitical crises have become the main triggers for exchange rate spikes in certain periods. However, unlike the 1998 crisis, depreciation in 2023 was not accompanied by a systemic crisis due to stronger policy responses and Indonesia's more robust economic fundamentals.

Bangladesh has experienced significant currency depreciation since 2021 owing to depleted foreign exchange reserves resulting from energy subsidies and excessive interventions (Amit & Kafy, 2024). Aftab et al. (2024) note that the country lacks an automatic adjustment mechanism in its exchange rate system, causing exchange rate pressure to further widen the balance of payments deficit and erode market confidence.The lack of an automatic adjustment mechanism in Bangladesh's exchange rate system has exacerbated the country's economic challenges. This situation has led to a vicious cycle in which exchange rate pressure further widens the balance of payments deficit, creating additional strain on foreign exchange reserves. Consequently, Bangladesh faces increasing difficulties in managing its currency stability and maintaining economic growth in the face of global economic uncertainty.

Macroeconomic Resilience in the Context of Exchange Rate Volatility

Macroeconomic resilience refers to a country's capacity to maintain overall economic stability despite internal or external pressures. In the context of exchange rate volatility, macroeconomic resilience refers to a country's ability to absorb currency fluctuations without causing significant disruptions to inflation, economic growth, external sector stability, or policy credibility.

A study Olamide et al. (2022) emphasize that developing countries that fail to manage exchange rate volatility tend to experience simultaneous weakening of macroeconomic indicators, such as depreciating exchange rates, soaring inflation, depleted foreign exchange reserves, and hampered economic growth. This interconnected impact underscores the importance of effective exchange rate management for maintaining macroeconomic stability. Countries with robust macroeconomic resilience are better equipped to weather currency fluctuations and to maintain investor confidence. Therefore, policymakers in developing nations must prioritize strategies that enhance their ability to absorb exchange rate shocks and minimize their negative effects on the broader economy.

Impact of Exchange Rate Volatility on Inflation

One of the most obvious impacts of exchange rate fluctuations is pressure on domestic price stability through the mechanism of imported inflation. In developing countries that rely on imported raw materials and consumer goods, currency depreciation increases production costs as well as the prices of finished goods. This leads to an indirect but significantly higher inflation rate, especially if the currency's weakness persists over a long period and is not offset by stabilization policies.

Rastogi and Kanoujiya (2024), in a study on India, found a long-term negative relationship between the exchange rate and consumer inflation (CPI). Using the GARCH model, they found that when the USD/INR exchange rate was volatile, inflation tended to rise because of higher prices for imported goods and essential commodities. Similarly, Olamide et al. (2022) noted in the SADC region that countries such as Zambia and Malawi experienced double-digit inflation spikes when their currencies depreciated sharply.

This inflationary pressure can have far-reaching consequences for the overall economy, affecting consumer purchasing power and business profitability. Central banks may respond by tightening their monetary policy, which can slow economic growth and investment. Furthermore, the impact of exchange rate fluctuations on inflation can create a vicious cycle because higher inflation may lead to further currency depreciation, exacerbating the initial problem.

Table 1. Relationship Between Inflation And Exchange Rates

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
C		0.855724	0.433240	1.975175	0.0506
NILAI_TUKAR		-4.29E-05	3.01E-05	-1.424912	0.1568
R-squared		0.016915			
Adjusted R-squared		0.008584			

The empirical analysis conducted using the Ordinary Least Squares (OLS) method provides additional insights into the relationship between inflation and exchange rates. This study utilized a substantial dataset of 120 monthly observations spanning from 2015 to 2024, allowing for a comprehensive examination of the variables over an extended period. Simple regression results reveal a negative coefficient (-0.0000429) for the exchange rate, suggesting an

inverse relationship with inflation. However, the statistical significance of this relationship was not firmly established at the conventional 5% level, as indicated by the p-value of 0.1568.

While the relationship between the exchange rate and inflation approaches significance at the 10% threshold, the low R² value of 0.0169 indicates that the exchange rate alone explains only a small portion (approximately 1.7%) of the inflation variation. This finding suggests that other factors not included in this simple regression model likely play a significant role in determining inflation rates. The analysis provides a starting point for understanding the dynamics between these economic variables, but also highlights the need for more comprehensive models that incorporate additional relevant factors to better explain inflationary trends. These results indicate that the exchange rate has a negative effect on inflation, which is consistent with the theory of imported inflation, although the effect remains statically relatively weak in this simple model. Possible reasons include the presence of other variables, such as global energy prices, subsidy policies, or domestic price adjustments that are not included in the model, which also contribute significantly to the actual inflation rate.

This finding reinforces the notion that the relationship between exchange rate volatility and inflation is complex and depends on the structure of the domestic economy as well as the government's policy capacity to mitigate price shocks. Countries with flexible fiscal adjustment mechanisms and timely monetary interventions tend to be better able to keep inflation stable, even in the face of exchange rate pressures. Moreover, the outcomes suggest that policymakers should consider a more comprehensive approach to manage inflation by incorporating multiple economic factors beyond exchange rate fluctuations. Further research could explore the impact of additional variables, such as global commodity prices, domestic production capacity, and monetary policy measures, to develop a more robust model for predicting and controlling inflation. Additionally, cross-country comparisons may provide valuable insights into the effectiveness of different policy strategies in mitigating exchange rate volatility's inflationary effects.

Impact on Economic Growth

Exchange rate volatility not only affects inflation but also has the potential to reduce economic growth, particularly through two main channels: investment uncertainty and the decline in foreign trade performance. When the exchange rate becomes unstable, businesses and investors face difficulties in planning production, export, and financing activities because the risks to profits increase. This resulted in postponed investment projects, reduced capital expenditures, and weakened net exports.

In a meta-analysis conducted by Sheykhi et al. (2025) of 36 empirical studies from developing countries, it was found that the average coefficient of the impact of exchange rate volatility on economic growth was –0.2432. This figure indicates that an increase in exchange rate volatility is significantly and negatively correlated with real output growth. The main mechanism is a decline in private sector investment due to exchange rate uncertainty and decreased export competitiveness when the exchange rate is unpredictable.

The same point was emphasized in a study by Olamide et al. (2022) on countries in the Southern African Development Community (SADC). They find that exchange rate volatility consistently undermines economic growth, especially in countries that rely on commodity exports. When export prices become unstable due to exchange rate fluctuations, national income falls and the capacity to finance economic development diminishes. The study also notes that in the long term, countries with unstable exchange rates tend to face a higher risk of recession than countries with more controlled exchange rates.

These findings highlight the importance of exchange rate stability in sustainable economic growth in developing nations. Policymakers should prioritize measures to reduce exchange rate volatility, such as implementing effective monetary policies and diversifying export portfolios. Furthermore, businesses operating in countries with

volatile exchange rates may need to adopt sophisticated risk management strategies to mitigate negative impacts on their investments and trade activities.

The negative effects of exchange rate volatility on economic growth underscore the need for robust policy interventions. Central banks and financial regulators should consider implementing measures such as foreign exchange market interventions, capital flow management, and macroprudential policies to stabilize exchange rates. Additionally, governments could focus on diversifying their economies and export bases to reduce their vulnerability to external shocks and currency fluctuations.

Foreign Exchange Reserves and Balance of Payments

Foreign exchange reserves serve as the primary shield for maintaining exchange rate stability. However, in times of crisis, developing countries tend to aggressively use their reserves to intervene in the foreign exchange market. Agosin and Díaz (2023) note that countries without strong domestic investors will lose their foreign exchange reserves more quickly when facing external pressure. Bangladesh is an example, where reserves have been depleted since 2021 owing to continued interventions and energy subsidies.

This situation also affects the balance between payments. If reserves decline and external debt increases due to depreciation, the country faces the risk of twin deficits fiscal deficit and external deficit occurring simultaneously. This twin deficit scenario can lead to a vicious cycle, further weakening the country's economic stability and creditworthiness. To address this challenge, policymakers must implement a comprehensive strategy that includes fiscal consolidation, structural reforms, and measures to attract foreign investments. Additionally, diversifying the economy and strengthening domestic financial markets can help reduce vulnerability to external shocks and improve the overall economic resilience.

Monetary and Fiscal Policy as Buffers

Macroeconomic resilience is significantly influenced by policy responses, particularly by monetary and fiscal policies. The central bank's monetary policy plays a crucial role in managing exchange rate volatility by adjusting interest rates to control capital outflows and to maintain the attractiveness of domestic assets. However, this approach can have unintended consequences such as reduced domestic demand and slower economic growth. On the fiscal front, governments must carefully manage budget deficits to avoid exerting additional pressure on exchange rates. Productive government spending can help to maintain purchasing power without triggering excessive inflation.

The effectiveness of these policy responses is enhanced through coordination between the monetary and fiscal authorities. As Aftab et al. (2024) highlight, such coordination is essential for preventing conflicting responses to volatility. Countries with coherent and credible policy frameworks have demonstrated greater resilience to exchange rate pressures. This underscores that exchange rate volatility is not merely a technical issue in the money market but a significant challenge to national economic stability.

Achieving macroeconomic resilience requires a comprehensive approach that extend beyond short-term reactions. This necessitates policy coordination, institutional preparedness, fiscal reserves, and strategies for economic diversification. Developing countries such as Indonesia can enhance their resilience amid global uncertainties by focusing on strengthening their external sectors, maintaining domestic price stability, and implementing flexible and adaptive policies. This multifaceted approach enables countries to better withstand and adapt to an ever-changing global economic landscape, ultimately fostering long-term economic stability and growth.

Policy Response in Maintaining Macroeconomic Stability

High exchange rate volatility requires developing countries not only to be reactive, but also to build a long-term policy framework that can maintain macroeconomic stability. Policy responses to exchange rate volatility generally involve a combination of monetary, fiscal, and market intervention, and structural reform policies. These policies must be designed holistically and in a coordinated manner so that they do not contradict each other and instead exacerbate instability. The effective implementation of these policies requires strong institutional capacity and coordination among various government agencies. Central banks play a crucial role in managing exchange rate volatility through monetary policy decisions and foreign exchange interventions. Additionally, developing countries should focus on diversifying their economies and strengthening their financial systems to reduce vulnerability to external shocks and enhance their resilience to exchange rate fluctuations.

Exchange Rate Intervention by Central Banks

Central banks in developing countries employ various forms of direct intervention in foreign exchange markets to manage exchange rate volatility. These interventions include selling foreign exchange reserves during sharp currency weakening, conducting open market operations to absorb foreign currency liquidity, and regulating the management of export foreign exchange and corporate foreign currency repatriation. The effectiveness of these interventions is closely tied to the central bank's credibility and the availability of foreign exchange reserves, with countries possessing weak reserves often struggling to curb currency depreciation and maintain external resilience (Agosin & Díaz, 2023).

Indonesia's central bank, Bank Indonesia, has implemented a unique dual stabilization strategy known as dual intervention. This approach combines interventions in both the foreign exchange market and the government bond (SBN) market to stabilize the exchange rate and foster investor confidence. By simultaneously managing exchange rate volatility and domestic liquidity conditions, Bank Indonesia can more effectively influence market sentiment and maintain its financial stability. This strategy has proven particularly valuable during periods of heightened global uncertainty, helping mitigate the impact of external shocks on the Indonesian economy and financial markets. The dual-intervention approach demonstrates how central banks in developing countries can adapt and innovate their policy tools to address the specific challenges they face in maintaining monetary and financial stability.

Adjustment of the Policy Interest Rate (BI-7DRRR)

The interest rate defense mechanism is a crucial tool employed by central banks to stabilize exchange rates during periods of capital outflow. By raising domestic interest rates, the central bank aims to make the country's financial assets more attractive to foreign investors, thereby encouraging capital inflows and supporting local currency. This strategy can be particularly effective in the short term, as it directly addresses the immediate pressure on the exchange rate. However, careful calibration it requires to balance the benefits of currency stabilization against potential negative impacts on domestic economic growth.

The case of Bank Indonesia in 2022-2023 illustrates the practical application and challenges of this approach. As the U.S. Federal Reserve implemented a series of interest rate hikes, Bank Indonesia responded by gradually increasing its policy rate to maintain the rupiah's stability. While this policy successfully prevented sharp depreciation of the currency, it also necessitated careful management of its effects on domestic demand and the real sector. Sheykhi et al. (2025) emphasize that countries implementing such monetary adjustments must do so judiciously to effectively mitigate exchange rate volatility without triggering economic contraction. This underscores the delicate balance that

central banks must strike between external stability and internal economic objectives when employing an interest rate defense mechanism.

Economic Diversification and Sources of Foreign Exchange

Economic resilience is intricately linked to a country's economic structure and ability to withstand external shocks. Countries heavily reliant on commodity exports or a single sector are particularly susceptible to exchange rate fluctuations, which can have far-reaching consequences for inflation and economic growth. This vulnerability is especially pronounced in African nations, which depend heavily on primary exports such as copper or oil, as highlighted by Olamide et al. (2022). Exchange rate fluctuations can have a severe impact on these economies, potentially leading to rapid inflation and stunted economic growth.

Countries can implement several strategies to mitigate these risks and enhance economic resilience. It is crucial to diversify the economy by promoting value-added industrial sectors and export services. This approach reduces the dependence on raw material exports and creates a more stable economic foundation. Additionally, expanding the export tax base and developing alternative sources of foreign exchange, such as tourism, the digital economy, and the manufacturing sector, can provide a buffer against external economic shocks. Indonesia's recent efforts to strengthen downstream industries for nickel and palm oil serve as an example of this strategy. By moving away from raw material exports and focusing on value-added products, Indonesia aims to reduce its economic vulnerability and stabilize its long-term foreign exchange flows, thereby enhancing its overall economic resilience.

CONCLUSIONS

This study highlights that exchange rate volatility poses a fundamental challenge for numerous developing nations, particularly those with open economies. By employing a descriptive methodology, it becomes clear that exchange rate fluctuations not only influence the financial sector but also directly affect price stability, economic growth, foreign exchange reserves, and the balance of payments. The case of Indonesia over the last ten years, especially during 2013, 2018, and 2022–2023, illustrates that currency fluctuations often arise from external factors, such as global monetary policies and geopolitical tensions. Depreciation of the rupiah has been shown to increase inflationary pressures (primarily through imported inflation), reduce growth prospects due to heightened investment uncertainty, and lead to a decrease in foreign exchange reserves due to frequent market interventions. However, monetary authority policy measures, such as adjustments to the BI-7DRRR interest rate and the dual intervention strategy of Bank Indonesia, have been deemed relatively effective in maintaining short-term stability and preventing a systemic crisis akin to that of 1998. This study also underscores that macroeconomic resilience is not solely determined by the size of foreign exchange reserves or interest rate levels, but also by the quality of policy coordination, economic diversification, and the robustness of fiscal and monetary institutions. Consequently, addressing exchange rate volatility necessitates a comprehensive and adaptive strategy that extends beyond short-term technical solutions and aims to establish a structurally sound economic system in the long term.

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