World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(REVIEW ARTICLE)

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Exchange rate volatility and foreign portfolio investment in emerging and developing economies

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World Journal of Advanced Research and Reviews, 2025, 25(02), 2408-2424

Publication history: Received on 16 January 2025; revised on 22 February 2025; accepted on 25 February 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.25.2.0616

Abstract

Exchange rate volatility remains a critical concern for policymakers and investors, particularly in emerging and developing economies (EDEs), where financial markets are more vulnerable to external shocks. This study explores the impact of exchange rate fluctuations on foreign portfolio investment (FPI) in these economies, emphasizing both the macroeconomic implications and the behavioral responses of investors. In the broader context, exchange rate volatility can create uncertainty in financial markets, influencing capital flows, asset prices, and overall economic stability. Investors, particularly those engaged in short-term speculative activities, tend to be highly responsive to currency risks, often leading to capital flight or sudden reversals in investment trends. Narrowing the focus, this study examines the mechanisms through which exchange rate volatility influences FPI in EDEs, including its effects on equity and bond markets. Volatile exchange rates can erode investment returns when denominated in foreign currencies, leading investors to demand higher risk premiums or seek safer assets. Moreover, weak institutional frameworks and limited monetary policy effectiveness in these economies exacerbate the risks associated with currency fluctuations. Empirical evidence suggests that excessive volatility discourages long-term FPI, while moderate fluctuations may create arbitrage opportunities for short-term speculators. Policymakers in EDEs must adopt sound exchange rate management strategies, enhance financial market resilience, and implement macroprudential policies to mitigate the adverse effects of volatility on portfolio investments. This study contributes to the ongoing debate on financial stability in emerging markets by providing insights into the relationship between exchange rate dynamics and foreign capital inflows, with implications for monetary policy, investor confidence, and economic growth.

Keywords: Exchange Rate Volatility; Foreign Portfolio Investment; Emerging Economies; Developing Economies; Financial Market Stability; Monetary Policy

1. Introduction

1.1. Background and Significance

Exchange rate volatility plays a crucial role in financial markets, influencing investment decisions and capital flows. In emerging and developing economies (EDEs), fluctuations in exchange rates can create uncertainty for foreign investors, thereby affecting foreign portfolio investment (FPI) inflows. The increased volatility in these economies is often attributed to macroeconomic instability, speculative trading, and shifts in global risk sentiment (Clark et al., 2004). Investors require certainty, and certainty means predictability. When exchange rates are unpredictable, expectations about future exchange rates become unanchored, leading to higher risks for portfolio investors (Chinn, 2006).

Foreign portfolio investment (FPI) is a vital source of capital for EDEs, providing liquidity to financial markets and contributing to economic growth. Unlike foreign direct investment (FDI), which involves long-term commitments, FPI

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is more volatile and sensitive to macroeconomic conditions, particularly exchange rate fluctuations (Goldberg, 2007). Studies have shown that heightened exchange rate volatility often leads to capital flight as investors seek safer assets in more stable economies (Rafi & Ramachandran, 2018). However, some investors may still participate in volatile markets, driven by high returns and favorable risk-reward trade-offs.

The theoretical underpinnings of exchange rate volatility and investor behavior can be linked to the uncovered interest parity (UIP) condition, which postulates that the expected change in the exchange rate should offset interest rate differentials between two countries (Taylor & Taylor, 2004). When this condition does not hold due to excessive volatility, investors may adjust their portfolio allocations accordingly. Empirical evidence suggests that portfolio flows are highly responsive to exchange rate movements, with volatility negatively impacting FPI in many EDEs (Frenkel, 1996).

1.2. Research Objectives and Scope

This study aims to investigate the relationship between exchange rate volatility and foreign portfolio investment in emerging and developing economies. Specifically, the research seeks to:

- Examine the inverse relationship between exchange rate volatility and FPI in selected EDEs.
- Quantify the extent to which exchange rate fluctuations influence investor decisions.
- Compare the impact of exchange rate volatility across different geo-economic regions, as classified by the International Monetary Fund (IMF).

The study focuses on a diverse set of EDEs across three regions: Sub-Saharan Africa, Latin America and the Caribbean, and Southeast Asia. These regions have been selected based on their economic significance and the availability of reliable data on exchange rates and capital flows (Ouedraogo, 2017). The research employs a panel data approach, combining macroeconomic indicators to provide a comprehensive analysis of the volatility-investment nexus.

While the primary focus is on exchange rate volatility, the study acknowledges the influence of other factors, including inflation, interest rates, and geopolitical risks. By controlling for these variables, the analysis aims to isolate the specific impact of exchange rate fluctuations on portfolio investment.

1.3. Contribution to Literature and Policy

This study contributes to the growing body of literature on exchange rate volatility and foreign investment by providing new empirical insights into the dynamics of FPI in EDEs. While prior research has examined the relationship between capital flows and exchange rates, there is a scarcity of studies that adopt a cross-regional approach to assess these interactions comprehensively (Goldberg & Kolstad, 1995). By analyzing multiple economies within distinct geo-economic regions, this study offers a comparative perspective that enhances our understanding of regional variations in investment responses.

From a policy standpoint, the findings of this research are relevant for central banks and financial regulators seeking to stabilize capital flows and mitigate the adverse effects of exchange rate volatility. Policymakers in EDEs often grapple with balancing monetary policy objectives and capital mobility, making it essential to understand how exchange rate fluctuations influence investor sentiment (Ghosh, Ostry & Tsangarides, 2010). By identifying the key drivers of FPI sensitivity to exchange rate movements, the study provides actionable insights that can inform exchange rate management strategies and investment policies.

Moreover, the study underscores the importance of developing robust financial markets that can absorb external shocks and enhance investor confidence. Strengthening institutional frameworks and implementing targeted policies to reduce excessive currency volatility can help attract and retain foreign investment, ultimately fostering sustainable economic growth in emerging and developing economies.

2. Theoretical framework and literature review

2.1. Exchange Rate Volatility: Theories and Measurement

Exchange rate volatility is a critical factor in international finance, influencing investment flows, trade competitiveness, and macroeconomic stability. Various theories explain exchange rate determination, including Purchasing Power Parity (PPP), Interest Rate Parity (IRP), and the Balance of Payments (BOP) framework.

2.1.1. Exchange Rate Determination Theories

- **Purchasing Power Parity (PPP)**: PPP suggests that exchange rates adjust to equalize the price levels of two countries over time (Taylor & Taylor, 2004). The theory assumes that goods should cost the same in different countries when measured in a common currency. However, deviations from PPP occur due to market imperfections, inflation differentials, and trade barriers.
- **Interest Rate Parity (IRP)**: The IRP theory posits that differences in nominal interest rates between two countries should equal the expected change in the exchange rate (Chinn, 2006). The **Uncovered Interest Rate Parity (UIP)** condition states that investors should be indifferent between domestic and foreign assets when adjusted for exchange rate expectations, but empirical evidence suggests deviations due to risk premia and investor behavior (Ghosh, Ostry & Tsangarides, 2010).
- **Balance of Payments (BOP) Framework**: According to the BOP theory, exchange rates are influenced by the current account (trade balance) and financial account (capital flows) of a country (Frenkel, 1996). A country with persistent trade deficits may experience depreciation, whereas capital inflows can lead to appreciation.

2.1.2. Measurement of Exchange Rate Volatility

To quantify exchange rate fluctuations, researchers employ various statistical and econometric methods:

- Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models: These models capture time-varying volatility and account for clustering effects in financial markets (Clark, Zeng & Sadikov, 2004).
- Standard Deviations: A simple method that calculates the average deviation of exchange rates from their mean value over a specific period (Hassan A, 2024).
- Moving Averages: This technique smooths short-term fluctuations and highlights long-term trends.

Empirical studies suggest that exchange rate volatility is higher in **emerging and developing economies (EDEs)** due to weak financial systems, policy uncertainty, and capital flow reversals (Ouedraogo, 2017). Policymakers often intervene using reserves, interest rate adjustments, and capital controls to stabilize exchange rate fluctuations.

2.2. The Role of Foreign Portfolio Investment in EDEs

Foreign portfolio investment (FPI) plays a crucial role in financial market development, capital mobilization, and economic growth in emerging and developing economies (EDEs). Unlike foreign direct investment (FDI), which involves long-term asset ownership, FPI refers to investments in equities, bonds, and money market instruments that are more liquid and volatile (Goldberg & Kolstad, 1995).

- Components of FPI
    - Equity Investments: Foreign investors purchase shares in domestic companies, injecting capital into stock markets and improving market efficiency.
    - Debt Securities (Bonds and Treasury Bills): Investors buy government and corporate bonds, contributing to public and private sector financing.
    - Money Market Instruments: Investments in short-term financial instruments provide liquidity but are highly sensitive to interest rate changes and exchange rate movements.
- Impact of FPI on Economic Growth and Financial Markets
    - Market Liquidity and Capital Formation: FPI enhances liquidity in stock and bond markets, making it easier for firms to raise capital and fund expansion (Rafi & Ramachandran, 2018).
    - Economic Growth and Investment Efficiency: By allocating capital to high-performing sectors, FPI can stimulate growth, improve productivity, and diversify financial markets (Chukwunweike JN et al..2024).
    - Exchange Rate and Macroeconomic Stability: While FPI inflows can strengthen the local currency, sudden outflows can trigger exchange rate crises and financial instability (Ghosh, Ostry & Tsangarides, 2010).

Empirical studies reveal that FPI in EDEs is highly sensitive to global economic conditions, exchange rate volatility, and interest rate differentials. During periods of heightened uncertainty, investors often engage in capital flight, leading to depreciation and financial distress (Taylor & Taylor, 2004). Thus, sound regulatory frameworks, monetary policy coordination, and exchange rate stability are crucial to sustaining FPI flows.

2.3. Impact of Exchange Rate Volatility on Foreign Portfolio Investment

Exchange rate volatility plays a significant role in shaping the behavior of foreign portfolio investors, influencing both short-term speculative capital flows and long-term investment decisions. Empirical studies indicate that higher exchange rate volatility discourages foreign portfolio investment (FPI) by increasing uncertainty and risk perception (Chinn, 2006; Goldberg & Kolstad, 1995). Investors tend to favor stable environments where returns are more predictable, and capital is less susceptible to sudden devaluations.

Empirical Findings on Exchange Rate Fluctuations and FPI

Research suggests that the impact of exchange rate volatility on FPI varies by economic region, policy environment, and investor risk appetite (Ouedraogo, 2017). For example:

- Developed vs. Emerging Markets: Developed economies with strong financial institutions exhibit lower sensitivity to exchange rate fluctuations, as their currencies are more stable and backed by robust monetary policies. In contrast, emerging and developing economies (EDEs) experience high capital flow volatility due to weaker institutions and policy inconsistencies (Rafi & Ramachandran, 2018).
- Short-term vs. Long-term Effects: Some studies argue that moderate exchange rate fluctuations create arbitrage opportunities, attracting speculative investors who profit from currency fluctuations. However, excessive volatility leads to capital flight, as investors shift towards safer assets in more stable markets (Taylor & Taylor, 2004).
- Regional Differences: Empirical analysis shows that Sub-Saharan Africa, Latin America, and Southeast Asia exhibit varying degrees of sensitivity to exchange rate volatility. In Latin America, for example, capital flight is often triggered by sudden devaluations, whereas in Southeast Asia, investors tend to react to policy-driven exchange rate shifts (Ghosh, Ostry & Tsangarides, 2010).

2.3.1. Short-Term vs. Long-Term Investor Behavior

Investors in foreign portfolio assets can be categorized into short-term speculators and long-term institutional investors, with differing reactions to exchange rate movements.

- Short-term investors (hedge funds, day traders, and currency speculators) focus on exploiting exchange rate volatility to generate quick profits. They engage in high-frequency trading, reacting immediately to currency fluctuations and shifting capital accordingly (Clark, Zeng & Sadikov, 2004).
- Long-term investors (pension funds, sovereign wealth funds, mutual funds) prioritize stability and predictability. These investors are more likely to withdraw from highly volatile economies due to concerns over exchange rate depreciation and macroeconomic instability (Chinn, 2006).

The carry trade strategy, in which investors borrow in low-interest-rate currencies to invest in higher-yielding assets, is particularly vulnerable to exchange rate volatility. When a currency suddenly depreciates, the profitability of carry trades diminishes, leading to large capital outflows (Frenkel, 1996).

Overall, high exchange rate volatility has been found to deter long-term FPI, while short-term investors may either benefit from volatility or flee depending on the magnitude of fluctuations. Policymakers must carefully manage exchange rate risks through monetary policy interventions, foreign exchange reserves, and macroprudential regulations to maintain investor confidence.

2.4. Gaps in Existing Literature

Despite extensive research on the relationship between exchange rate volatility and foreign portfolio investment, several gaps remain in empirical and theoretical studies.

Identifying Gaps in Research

- Lack of Comprehensive Regional Comparisons: While studies analyze individual countries or broad emerging markets, cross-regional comparisons (e.g., Africa vs. Latin America vs. Asia) remain underexplored (Ouedraogo, 2017). Differences in institutional quality, monetary policy frameworks, and capital controls could significantly impact the volatility-investment relationship.
- Limited Understanding of Policy Interventions: Research often focuses on exchange rate fluctuations without considering policy measures that mitigate their effects. The role of capital flow management tools, currency

stabilization funds, and investor confidence mechanisms needs further investigation (Ghosh, Ostry & Tsangarides, 2010).

- Short-Term vs. Long-Term Investment Decisions: Most studies assess aggregate FPI movements without differentiating investment horizons. There is a need to understand how institutional investors and speculative traders react differently to volatility (Taylor & Taylor, 2004).

2.4.1. The Need for Further Investigation

Future research should adopt a multi-region panel data approach to compare FPI responses across different exchange rate regimes. Additionally, studying the effectiveness of monetary policy coordination, fiscal policies, and global financial integration in mitigating volatility-induced investment declines would provide valuable insights for policymakers. Addressing these gaps would contribute to more targeted and effective exchange rate management strategies in EDEs.

3. Exchange rate volatility trends and FPI flows in EDES

3.1. Trends in Exchange Rate Volatility

Exchange rate volatility in emerging and developing economies (EDEs) has exhibited significant fluctuations over time, driven by factors such as macroeconomic instability, external shocks, and speculative capital flows. Historical trends indicate that currency volatility is generally higher in EDEs than in developed economies due to weaker monetary institutions and lower investor confidence (Ghosh, Ostry & Tsangarides, 2010).

3.1.1. Historical Trends of Exchange Rate Fluctuations in Major EDEs

The post-Bretton Woods era witnessed increasing exchange rate fluctuations, particularly after the adoption of floating exchange rate regimes by many developing economies. During the 1990s and early 2000s, financial crises such as the Asian Financial Crisis (1997) and the Latin American debt crises (1980s and 1990s) highlighted the vulnerability of EDEs to volatile capital movements and external shocks (Frenkel, 1996). More recently, the 2008 Global Financial Crisis and COVID-19 pandemic have further exposed EDEs to exchange rate instability as investors reassessed risks.

Several factors contribute to high exchange rate volatility in these economies:

- Macroeconomic Instability – High inflation, fiscal deficits, and inconsistent monetary policies exacerbate currency fluctuations (Chinn, 2006).
- Capital Flow Reversals – Sudden capital outflows in response to external shocks, such as the Federal Reserve's interest rate hikes, lead to sharp depreciation (Ouedraogo, 2017).
- Commodity Price Dependence – Many EDEs rely on commodity exports (e.g., oil, metals, and agricultural products), making their currencies susceptible to price swings (Rafi & Ramachandran, 2018).

3.1.2. Case Studies of Extreme Volatility Episodes

- Asian Financial Crisis (1997) – The devaluation of the Thai baht triggered a regional currency collapse, with Indonesia, South Korea, and Malaysia experiencing severe depreciation and capital outflows. Many EDEs transitioned to more flexible exchange rate regimes post-crisis to prevent recurrence (Taylor & Taylor, 2004).
- Argentine Peso Crisis (2001-2002) – Argentina's currency peg to the US dollar collapsed due to unsustainable fiscal policies, leading to a sharp devaluation of over 300% and loss of investor confidence.
- COVID-19 and Exchange Rate Shocks (2020) – During the pandemic, emerging market currencies depreciated sharply as global risk aversion increased. However, unprecedented monetary easing by central banks helped stabilize capital flows in 2021 (Goldberg & Kolstad, 1995).

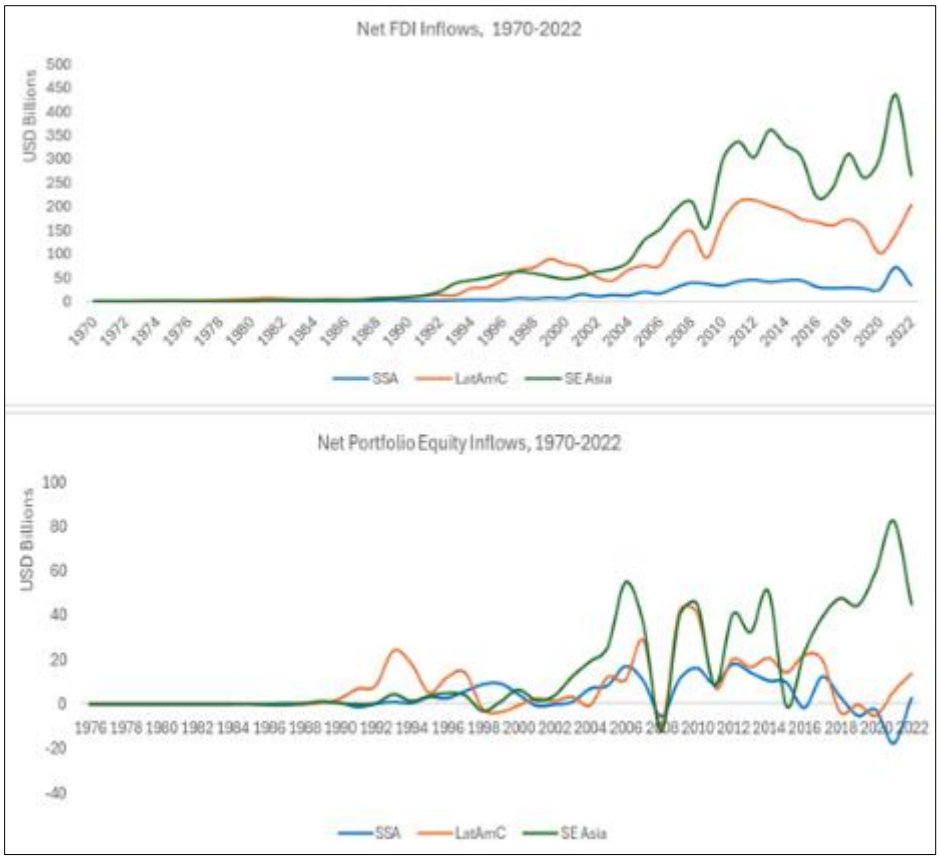

Figure 1 Historical Trends of Exchange Rate Volatility in EDEs (World Bank, IMF International Financial Statistics)

3.2. Patterns of Foreign Portfolio Investment in EDEs

Foreign portfolio investment (FPI) flows in EDEs are influenced by global liquidity conditions, interest rate differentials, and investor risk appetite. While these economies attract FPI due to higher returns, capital flows are highly sensitive to global economic conditions (Ghosh, Ostry & Tsangarides, 2010).

3.2.1. Trends in Capital Inflows and Outflows

- Pre-2008 Financial Crisis – The early 2000s witnessed a surge in FPI inflows, as low-interest rates in developed markets fueled a search for higher yields in emerging economies (Chinn, 2006).
- Post-2008 Crisis and Quantitative Easing (QE) – Developed economies introduced QE policies, leading to large capital inflows into emerging markets as investors sought higher returns (Frenkel, 1996).
- Taper Tantrum (2013) – When the US Federal Reserve announced plans to reduce QE, emerging market currencies depreciated sharply due to capital flight, highlighting the fragility of FPI flows (Taylor & Taylor, 2004).
- COVID-19 Crisis (2020-2021) – Capital outflows peaked in early 2020 as investors exited riskier assets, but markets rebounded in 2021 due to fiscal stimulus and lower interest rates (Rafi & Ramachandran, 2018).

3.2.2. How Global Economic Events Influence FPI Movements

- US Federal Reserve Policy: Interest rate hikes in the US often trigger capital outflows from EDEs as investors seek safer, higher-yielding assets.
- Commodity Price Shocks: Oil price fluctuations significantly impact FPI flows in oil-exporting nations like Nigeria and Brazil.
- Geopolitical Risks: Political instability and policy uncertainty deter long-term investors, leading to heightened capital flight.

Empirical studies suggest that financial market depth and macroeconomic stability are key determinants of FPI resilience in the face of exchange rate volatility (Ouedraogo, 2017).

3.3. Regional Differences in Exchange Rate Volatility and FPI

Emerging markets across Latin America, Africa, and Southeast Asia exhibit distinct patterns of exchange rate volatility and foreign portfolio investment. Differences arise due to varying monetary policies, economic structures, and exposure to external shocks (Goldberg & Kolstad, 1995).

3.3.1. Latin America

- High exchange rate volatility due to chronic inflation, political instability, and dependence on commodity exports.
- Capital inflows fluctuate based on US monetary policy, with episodes of severe capital flight (e.g., Mexico in 1994, Argentina in 2001).
- Brazil and Mexico have developed deep financial markets, but face cyclical swings in FPI due to policy changes.

3.3.2. Sub-Saharan Africa

- Limited financial market depth results in high sensitivity to exchange rate shocks.
- Capital inflows remain low due to weak investor confidence and currency risks.
- Nigeria and South Africa attract the most FPI, but volatile exchange rates deter long-term investment (Ghosh, Ostry & Tsangarides, 2010).

3.3.3. Southeast Asia

- Greater stability in exchange rates due to strong monetary policies post-1997 crisis.
- Resilient capital markets in Malaysia, Indonesia, and Thailand support long-term FPI inflows.
- China's economic influence stabilizes regional capital flows, reducing exchange rate volatility

Table 1 Summary of Exchange Rate Volatility and FPI Trends by Region

Region	Exchange Rate Volatility Characteristics	Foreign Portfolio Investment (FPI) Trends	Key Factors Influencing FPI
Latin America	High volatility due to macroeconomic instability, fiscal deficits, and inflationary pressures.	FPI is highly cyclical, with strong inflows during economic booms but sharp capital flight during crises (e.g., Mexico 1994, Argentina 2001).	Political instability, high inflation, dependency on commodity exports, and US interest rate policies.
Sub-Saharan Africa	Moderate to high volatility due to weak financial markets, external debt pressures, and commodity dependence.	FPI inflows are lower compared to other emerging markets due to limited financial infrastructure and market depth.	Exchange rate instability, weak regulatory frameworks, and poor liquidity in financial markets.
Southeast Asia	Moderate volatility with stronger financial systems and managed exchange rate regimes.	FPI inflows are relatively stable, with resilience due to deeper capital markets and stronger economic fundamentals (e.g., Malaysia, Thailand, Indonesia).	Central bank interventions, robust macroeconomic policies, export-driven economies.
Eastern Europe	Moderate to high volatility due to geopolitical risks and external debt exposure.	FPI flows are vulnerable to external shocks (e.g., 2008 crisis), but EU integration has helped stabilize capital flows.	EU membership, monetary policy alignment, political stability concerns.
Middle East & North Africa (MENA)	Exchange rate volatility varies by country, with oil-exporting nations maintaining relative stability through currency pegs.	FPI in equity markets is growing, but overall investment remains concentrated in energy sectors.	Oil price fluctuations, currency pegs, geopolitical stability, regulatory reforms.

South Asia	Moderate volatility due to trade imbalances and inflation pressures.	FPI flows fluctuate based on global risk sentiment, with India attracting substantial inflows in equities and bonds.	Capital market openness, inflation control, and monetary policy effectiveness.

4. Mechanisms through which exchange rate volatility affects FPI

4.1. Currency Risk and Investment Decision-Making

Foreign portfolio investors face currency risk, which arises when exchange rate fluctuations affect the value of investments denominated in foreign currencies. The uncertainty surrounding future exchange rates impacts investment decisions, expected returns, and capital allocation strategies.

4.1.1. How Exchange Rate Fluctuations Influence Investor Expectations

Exchange rate volatility influences investors' risk assessment and expected returns on foreign assets. Several key dynamics shape investment decisions:

- Exchange Rate Expectations and Portfolio Adjustments – Investors form expectations based on macroeconomic indicators, interest rate differentials, and central bank policies (Chinn, 2006). If an investor anticipates currency depreciation, they may reduce holdings in local assets or demand higher returns.
- Impact on Asset Pricing – Sudden depreciation of a currency reduces the real value of investment returns, discouraging capital inflows. Conversely, appreciation may attract investors seeking currency gains alongside asset returns (Frenkel, 1996).
- Hedging Strategies – Institutional investors mitigate currency risk through hedging instruments such as forwards, options, and swaps, but these hedging costs reduce the attractiveness of high-volatility markets (Ghosh, Ostry & Tsangarides, 2010).

4.1.2. The Role of Risk Aversion and Risk Premiums in FPI Decisions

Investors weigh risk premiums when allocating portfolio investments to emerging markets:

- Risk-Averse Investors: Prefer stable exchange rate environments where return predictability is higher (Taylor & Taylor, 2004).
- Risk-Tolerant Investors: May exploit high volatility markets for arbitrage opportunities but typically demand higher risk-adjusted returns.

Risk premiums in EDEs are priced into bond yields, equity valuations, and capital flows. Countries with weak monetary frameworks and frequent currency devaluations must offer higher yields to attract investors, increasing borrowing costs (Goldberg & Kolstad, 1995).

4.2. Interest Rate Differentials and Capital Movements

The interaction between interest rates and exchange rates plays a fundamental role in foreign portfolio investment decisions, as investors seek markets offering the highest risk-adjusted returns (Gerald N et al..2024).

The Interplay Between Exchange Rates and Interest Rates in Attracting or Deterring FPI

Interest rate differentials influence capital flows and exchange rate movements:

- Higher Interest Rates and Capital Inflows – Countries with higher real interest rates attract foreign investors seeking superior returns on bonds and fixed-income securities (Chinn, 2006).
- Exchange Rate Volatility and Policy Uncertainty – If a high-yield market experiences frequent currency depreciation, investors may refrain from investing, fearing losses from currency movements (Ouedraogo, 2017).
- Central Bank Policies and Inflation Risks – Countries with inflation-targeting regimes and credible monetary policies experience more stable capital inflows, as investors trust their ability to manage currency risks (Frenkel, 1996).

4.2.1. The Role of Carry Trades in Volatile Exchange Rate Environments

Carry trade strategies involve borrowing in low-interest-rate currencies to invest in high-yield assets. These trades are profitable when exchange rates remain stable but vulnerable to sudden currency fluctuations.

- Yen Carry Trade (Pre-2008 Crisis) – Investors borrowed in low-yielding Japanese yen to invest in higher-yielding emerging market assets. When the global financial crisis hit, capital reversed sharply, leading to currency depreciation in target economies (Taylor & Taylor, 2004).
- Taper Tantrum (2013) – The US Federal Reserve's announcement to taper quantitative easing triggered carry trade unwinding, leading to sharp currency depreciation in Brazil, India, and Indonesia (Goldberg & Kolstad, 1995).

Carry trades exacerbate exchange rate volatility, as rapid capital inflows and outflows amplify currency fluctuations, posing risks for monetary authorities trying to stabilize exchange rates.

4.3. Market Liquidity and Investor Sentiment

Exchange rate volatility influences financial market liquidity, as foreign portfolio investors adjust their holdings based on currency risks.

Impact of Exchange Rate Movements on Stock and Bond Market Liquidity

- Stock Market Liquidity – Exchange rate depreciation often leads to capital flight from equities, reducing trading volumes and liquidity (Chinn, 2006). Investors shift capital to safer assets, causing price volatility.
- Bond Market Liquidity – Foreign investors dominate local bond markets in many EDEs. Currency depreciation increases debt-servicing costs, prompting bond sell-offs and higher yields (Ouedraogo, 2017).
- Central Bank Interventions – Monetary authorities intervene in currency markets to stabilize liquidity but may face challenges in sustaining investor confidence (Frenkel, 1996).

4.3.1. How Investor Sentiment Shifts Due to Currency Instability

Investor sentiment is highly sensitive to currency fluctuations:

- Optimism in Stable Exchange Rate Regimes – Investors prefer economies with low volatility and predictable currency policies (Taylor & Taylor, 2004).
- Panic Selling During Depreciations – In markets with frequent currency crises, investors exit quickly, leading to sharp capital outflows and declining market valuations (Goldberg & Kolstad, 1995).

Countries that implement macroprudential measures, strengthen financial institutions, and improve transparency are better positioned to maintain investor confidence in the face of currency instability.

5. Empirical evidence on exchange rate volatility and FPI

5.1. Methodological Approaches in Existing Studies

Empirical research on the relationship between exchange rate volatility and foreign portfolio investment (FPI) employs various econometric models to quantify the impact of currency fluctuations on capital flows. The most commonly used methodologies include Vector Autoregression (VAR), Generalized Autoregressive Conditional Heteroskedasticity (GARCH), and panel regression models.

5.1.1. Overview of Econometric Models Used

- Vector Autoregression (VAR) Models
  - VAR models capture the interdependencies between exchange rate fluctuations, capital flows, and macroeconomic variables (Chinn, 2006).
  - They are useful for identifying the dynamic response of FPI to exchange rate shocks.
- GARCH Models
  - GARCH (1,1) and its extensions (EGARCH, TGARCH) are widely used to measure time-varying exchange rate volatility (Frenkel, 1996).
  - These models allow researchers to analyze the impact of volatility clustering on investor behavior.

- Panel Regression Models
    - Panel data techniques, such as fixed effects, random effects, and dynamic panel regression, control for country-specific heterogeneity (Ghosh, Ostry & Tsangarides, 2010).
    - Studies using panel data typically assess the impact of exchange rate fluctuations across multiple emerging and developing economies (Ouedraogo, 2017).

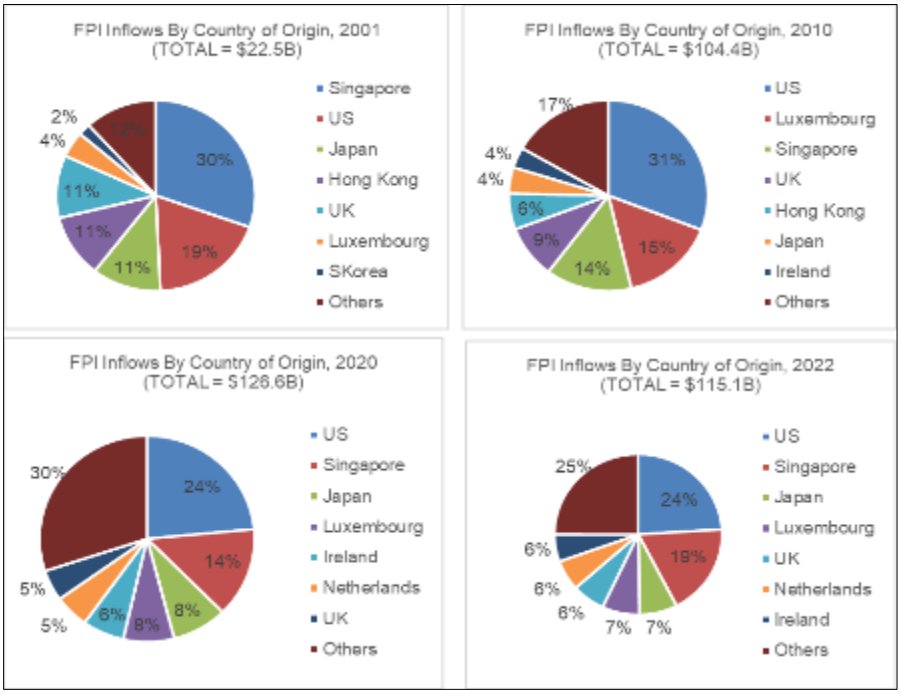

Figure 2 Malaysia: Evolution and composition of FPI flows into Malaysia by country of origin of investors (2001,2010, 2020, and 2022). Philippines , Thailand and Indonesia have similar evolution and compositions

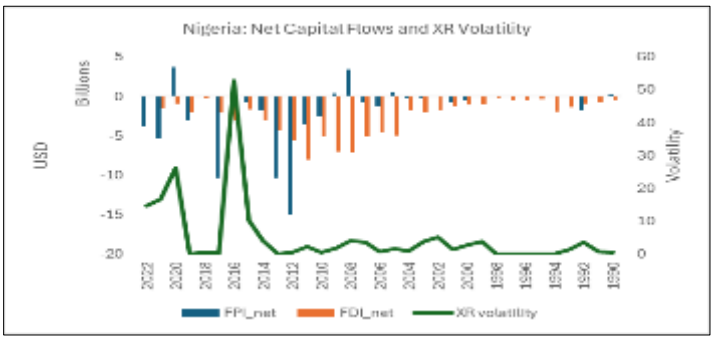

Figure 3a

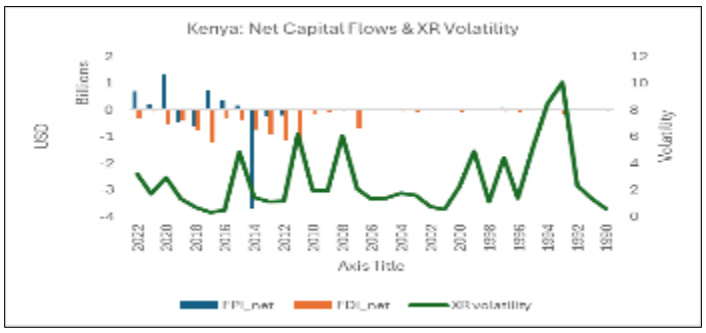

Figure 3b

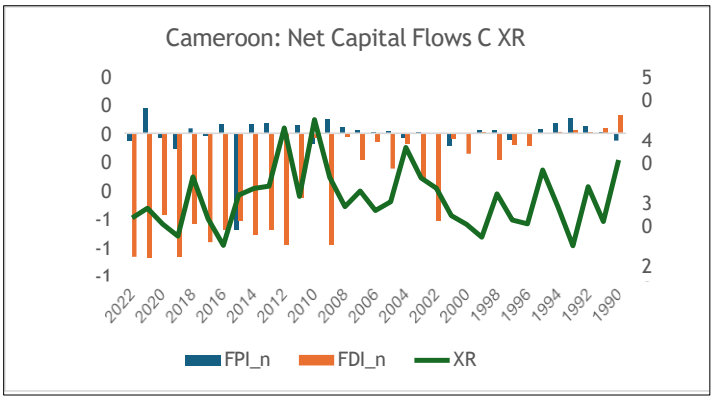

Figure 3c Comparison of Net Capital Flows and XRV

These methodologies provide robust empirical frameworks for analyzing the effects of exchange rate movements on portfolio flows, investor sentiment, and market stability.

5.2. Empirical Findings on Exchange Rate Volatility and FPI

Several studies have investigated the empirical relationship between exchange rate volatility and FPI, revealing both negative and positive effects depending on market conditions, policy frameworks, and regional dynamics.

Key Empirical Results from Recent Studies

- Negative Impact of Exchange Rate Volatility on FPI
  - High exchange rate volatility discourages portfolio inflows, as it increases uncertainty and risk perception among investors (Goldberg & Kolstad, 1995).
  - Studies using GARCH models confirm that high volatility periods coincide with capital flight in emerging markets (Rafi & Ramachandran, 2018).
- Moderate Volatility and Speculative Opportunities
  - Some studies argue that short-term investors may exploit exchange rate fluctuations for arbitrage opportunities (Taylor & Taylor, 2004).
  - Portfolio inflows may increase temporarily in markets where investors expect stabilization policies to mitigate volatility risks (Ghosh, Ostry & Tsangarides, 2010).

Regional Case Studies Highlighting Different Experiences

- Latin America
  - Countries such as Argentina and Brazil have experienced high capital outflows due to currency crises and inflationary pressures.
  - VAR models suggest that exchange rate shocks in Latin America lead to persistent reductions in FPI (Ouedraogo, 2017).
- Sub-Saharan Africa
  - Nigeria and South Africa attract FPI due to higher yields in bond markets, but currency volatility deters long-term investment.
  - Panel regressions indicate that policy uncertainty amplifies capital flow volatility (Chinn, 2006).
- Southeast Asia
  - Thailand, Indonesia, and Malaysia have demonstrated resilience to exchange rate fluctuations, supported by strong monetary policies.
  - Empirical studies using GARCH models suggest that investor confidence in these economies remains stable despite moderate volatility (Frenkel, 1996).

Table 2 Summary of Empirical Studies on Exchange Rate Volatility and Foreign Portfolio Investment (FPI)

Study	Methodology	Key Findings	Regional Focus
Chinn (2006)	VAR Model, Interest Rate Differentials Analysis	High exchange rate volatility reduces foreign investment inflows by increasing risk perceptions.	Global (Developed & Emerging Markets)
Frenkel (1996)	GARCH Model, Capital Flow Volatility Analysis	Currency depreciation triggers capital flight in Latin America; long-term investors avoid high-volatility markets.	Latin America
Ghosh, Ostry & Tsangarides (2010)	Panel Regression, Fixed & Floating Exchange Rate Systems	Countries with managed exchange rate regimes exhibit more stable FPI inflows than those with purely floating rates.	Emerging Markets
Goldberg & Kolstad (1995)	Structural Model, Exchange Rate Variability & FPI Linkages	Exchange rate uncertainty reduces foreign equity investments, especially in economies with weak monetary policies.	US, Europe, Asia
Ouedraogo (2017)	Panel Data Econometrics, Real Effective Exchange Rate Analysis	Currency instability negatively impacts investor confidence; strong monetary policies attract sustainable FPI.	Sub-Saharan Africa
Rafi & Ramachandran (2018)	Event Study Approach, Emerging Market Crises Analysis	Sudden devaluations lead to abrupt FPI withdrawals, with stock and bond markets experiencing higher volatility.	Southeast Asia
Taylor & Taylor (2004)	Interest Rate Parity and Purchasing Power Parity Models	Short-term speculative capital responds positively to moderate volatility, but extreme fluctuations drive long-term investors away.	Global

These findings highlight the regional heterogeneity in FPI responses, emphasizing the need for tailored policy interventions to stabilize capital flows.

5.3. Limitations of Existing Empirical Studies

Despite significant progress in understanding the relationship between exchange rate volatility and FPI, several limitations persist in existing empirical research.

- Data Availability and Quality
  - Many studies rely on limited or outdated data, affecting the accuracy of empirical models (Ghosh, Ostry & Tsangarides, 2010).
  - Exchange rate fluctuations may be influenced by unobservable factors, leading to measurement errors.
- Model Specification Issues
  - VAR and GARCH models require large datasets to produce reliable results, which may not be available for smaller economies (Ouedraogo, 2017).
  - Many studies do not fully account for structural breaks, such as policy shifts or financial crises.
- Endogeneity Concerns
  - The relationship between exchange rate volatility and FPI is bidirectional, making it difficult to establish clear causality (Goldberg & Kolstad, 1995).
  - Policy measures, such as capital controls and central bank interventions, further complicate empirical assessments.

Future research should focus on more granular data, improved econometric models, and better accounting for policy interventions to enhance the robustness of empirical findings.

6. Policy implications and risk mitigation strategies

6.1. Policy Interventions to Stabilize Exchange Rates

Exchange rate volatility poses significant risks to foreign portfolio investment (FPI) and macroeconomic stability in emerging and developing economies (EDEs). Central banks and policymakers play a crucial role in mitigating currency fluctuations through monetary interventions, foreign exchange reserves management, and exchange rate policies.

The Role of Central Banks in Managing Currency Volatility

- Monetary Policy Adjustments
    - Interest rate interventions: Central banks can raise interest rates to attract foreign capital and stabilize the currency during depreciation phases (Chinn, 2006).
    - Inflation targeting: Countries adopting inflation-targeting regimes tend to have more stable exchange rates and higher investor confidence (Ghosh, Ostry & Tsangarides, 2010).
- Market Interventions and Exchange Rate Smoothing
    - Central banks may conduct foreign exchange market interventions by buying or selling foreign currencies to stabilize fluctuations.
    - Studies suggest that sterilized interventions (where monetary expansion is offset) are more effective in preventing inflationary consequences (Frenkel, 1996).

6.1.1. Use of Foreign Exchange Reserves and Currency Pegs

- Foreign Exchange Reserves
    - Accumulation of reserves enables countries to counteract short-term exchange rate shocks and maintain stability (Goldberg & Kolstad, 1995).
    - Large reserve buffers increase investor confidence and reduce speculative attacks.
- Currency Pegs and Managed Float Regimes
    - Fixed exchange rate regimes (e.g., currency boards) offer stability but require significant reserves to maintain credibility (Taylor & Taylor, 2004).
    - Managed float systems, where authorities intervene occasionally, provide more flexibility while maintaining stability.

Empirical evidence suggests that countries with strong monetary policies and foreign reserve buffers experience lower exchange rate volatility and more stable capital flows (Ouedraogo, 2017).

6.2. Risk Management Strategies for Foreign Investors

Foreign investors in volatile currency markets employ risk management techniques to mitigate potential losses from exchange rate fluctuations. Two major approaches include hedging techniques and portfolio diversification.

Hedging Techniques (Forwards, Options, Swaps)

- Forward Contracts
    - Investors lock in an exchange rate for a future transaction, reducing exposure to currency fluctuations.
    - Commonly used in bond and equity investments to protect returns from adverse exchange rate movements (Chinn, 2006).
- Options and Swaps
    - Currency options provide the right (but not obligation) to exchange at a pre-agreed rate, offering flexibility in uncertain markets (Ghosh, Ostry & Tsangarides, 2010).
    - Cross-currency swaps allow investors to exchange principal and interest payments in different currencies, minimizing exchange rate risks.

Diversification Strategies to Minimize Exchange Rate Exposure

- Geographical Diversification
    - Holding assets across multiple currency zones reduces dependence on a single currency and lowers risk (Taylor & Taylor, 2004).
- Asset-Class Diversification

- Investors mix equities, bonds, and money market instruments to hedge against volatility-driven losses.
- Empirical studies confirm that multi-asset strategies perform better during high-volatility periods (Goldberg & Kolstad, 1995).

By adopting a combination of hedging instruments and diversified portfolios, foreign investors can mitigate risks while maintaining exposure to high-return EDEs.

6.3. Strengthening Financial Markets in Emerging and Developing Economies (EDEs)

To attract and retain foreign portfolio investment (FPI), emerging and developing economies (EDEs) must implement structural reforms that enhance financial stability, market efficiency, and investor confidence. Strengthening institutional frameworks, regulatory mechanisms, and financial infrastructure plays a pivotal role in stabilizing capital flows and mitigating the negative impact of exchange rate volatility.

6.3.1. Institutional Reforms to Enhance Investor Confidence

Institutional weaknesses, such as policy uncertainty, inadequate financial regulations, and political instability, often deter long-term foreign investment. Implementing strong governance structures and credible monetary policies can improve market resilience.

- Strengthening Central Bank Independence
  - Autonomous central banks that operate free from political interference are more effective in implementing credible monetary policies, reducing currency volatility (Ouedraogo, 2017).
  - Central banks with clear inflation-targeting mandates enhance investor confidence and reduce capital flight risks (Nwafor KC et al 2024).
- Developing Deeper Financial Markets
  - Expanding stock and bond markets improves market liquidity, making it easier for foreign investors to enter and exit positions.
  - Deep capital markets absorb external shocks, minimizing sudden capital reversals (Chinn, 2006).
  - Encouraging domestic institutional investors (pension funds, mutual funds) to participate actively in domestic asset markets enhances financial stability, reducing over-reliance on volatile foreign capital.

6.3.2. Role of Regulatory Frameworks in Stabilizing Capital Flows

A strong regulatory framework ensures that market participants follow transparent and responsible investment practices, reducing speculative behavior and enhancing long-term market stability.

- Macroprudential Regulations
  - Capital flow management tools (e.g., capital controls, transaction taxes, and reserve requirements) help curb excessive speculative inflows and outflows, reducing currency crises (Ghosh, Ostry & Tsangarides, 2010).
  - Prudential policies ensure banks and non-bank financial institutions maintain sufficient capital buffers to absorb external shocks.
- Improving Transparency and Governance
  - Implementing stronger corporate governance frameworks, enhanced financial disclosure requirements, and market surveillance mechanisms builds investor trust (Frenkel, 1996).
  - Transparent financial reporting and credible auditing practices reduce information asymmetry, lowering the perceived risk for foreign investors.
- Foreign Exchange Market Reforms
  - Developing efficient foreign exchange markets enables investors to hedge currency risks effectively, reducing their exposure to exchange rate fluctuations.
  - Expanding access to derivatives markets (currency forwards, options, and swaps) allows investors to manage risk more efficiently.
  - Establishing centralized currency trading platforms reduces market inefficiencies and prevents speculative-driven volatility (Gerald N. 2024).

Strengthening financial markets in EDEs through institutional reforms, regulatory oversight, and financial deepening is crucial for attracting stable FPI inflows. Countries that enhance financial transparency, ensure monetary policy credibility, and develop risk management instruments are better positioned to manage exchange rate volatility while maintaining long-term investment attractiveness.

Table 3 Policy Measures and Their Effectiveness in Managing Exchange Rate Volatility

Policy Measure	Description	Effectiveness	Challenges
Monetary Policy Adjustments	Central banks adjust interest rates to influence exchange rates and control inflation.	Effective in stabilizing inflation and attracting FPI when implemented credibly.	Delayed impact; risk of capital flight if policy lacks credibility.
Foreign Exchange Market Interventions	Buying or selling foreign reserves to stabilize currency fluctuations.	Short-term stability in currency markets; prevents speculative attacks.	Depletes reserves; may distort market mechanisms.
Exchange Rate Regimes (Fixed vs. Floating)	Pegging the currency to another or allowing market-driven fluctuations.	Fixed rates provide stability; floating rates allow market-driven adjustments.	Fixed regimes require large reserves; floating rates can be highly volatile.
Capital Flow Management Measures (Capital Controls)	Restrictions on capital inflows and outflows to curb speculative movements.	Can prevent sudden capital flight and stabilize exchange rates in crisis periods.	May deter long-term FPI and lead to market inefficiencies.
Foreign Exchange Reserves Management	Accumulating reserves to intervene during periods of excessive volatility.	Enhances market confidence and mitigates sharp currency depreciation.	High opportunity costs of maintaining large reserves.
Macroprudential Regulations	Strengthening financial institutions and risk monitoring.	Improves financial stability and reduces systemic risks.	Requires strong institutional frameworks and consistent enforcement.
Market Liquidity Enhancements	Developing bond and derivative markets to absorb external shocks.	Reduces exchange rate fluctuations by deepening financial markets.	Developing markets may lack sufficient investor participation.
Hedging Facilities for Investors	Availability of currency derivatives (forwards, options, swaps) to manage risks.	Encourages FPI inflows by reducing currency risk.	Limited access in some EDEs; requires financial literacy among investors.

Countries that implement sound financial regulations, deepen capital markets, and enhance transparency experience greater stability in capital flows and higher resilience to currency crises (Goldberg & Kolstad, 1995).

7. Future research directions and conclusion

7.1. Unexplored Areas and Research Directions

While significant research has been conducted on exchange rate volatility and foreign portfolio investment (FPI), several critical areas remain underexplored.

Need for More Granular Data on Investor Behavior

Most existing studies analyze aggregate FPI flows, but micro-level data on investor behavior is limited. Future research should:

- Differentiate investor types – Distinguishing between institutional investors, hedge funds, and retail investors can improve understanding of risk-taking behavior.
- Assess real-time investment responses – High-frequency trading and short-term speculation require more granular datasets to capture real-time capital flows.

Exploring the Impact of New Financial Instruments on FPI

- Cryptocurrencies and Digital Assets – The rise of crypto-based investments and central bank digital currencies (CBDCs) could alter capital flow dynamics in emerging economies.
- Green Bonds and ESG Investments – As sustainability-linked financial instruments gain traction, the role of ESG criteria in investor decision-making warrants further exploration.

A deeper analysis of the evolving financial landscape and its interaction with exchange rate risks will enhance policy design and investment strategies in emerging and developing economies (EDEs).

7.2. Summary of Key Findings

This study analyzed the complex relationship between exchange rate volatility and FPI, highlighting both short-term and long-term investment dynamics.

Key Insights on Exchange Rate Volatility and FPI

- Exchange Rate Volatility and Investor Sentiment
  - High currency volatility deters long-term portfolio investments and encourages short-term speculation.
  - Stable exchange rate regimes attract sustained FPI flows, reinforcing market confidence.
- Role of Macroeconomic Policies in Stabilizing FPI
  - Central bank interventions and foreign exchange reserves play a crucial role in reducing exchange rate instability.
  - Interest rate differentials and capital controls significantly affect capital mobility in EDEs.
- Regional Differences in Exchange Rate Sensitivity
  - Latin America experiences capital flight during exchange rate crises, while Southeast Asia has developed stronger policy buffers.
  - Institutional quality and regulatory transparency remain key determinants of FPI resilience.

By integrating empirical evidence and policy analysis, this study contributes to a deeper understanding of financial stability in volatile currency environments.

8. Conclusion

Exchange rate volatility continues to shape capital flows and investment decisions in emerging markets. While short-term investors exploit volatility for speculative gains, long-term investors seek stability. Policymakers in EDEs must strike a balance between maintaining exchange rate flexibility and ensuring financial market resilience.

8.1.1. Final Thoughts on Policy Recommendations

- Strengthening Monetary and Exchange Rate Policies
  - Flexible exchange rate regimes, supported by effective foreign exchange reserves management, can reduce excessive volatility
  - Inflation targeting frameworks improve investor confidence and encourage long-term capital retention.
- Enhancing Financial Market Depth and Transparency
  - Well-regulated markets mitigate speculative capital movements and enhance FPI stability
  - Developing local bond markets and alternative investment instruments reduces dependence on foreign capital.
- Encouraging Diversification in Investment Strategies
  - Foreign investors should adopt hedging techniques and geographical diversification to minimize risks in high-volatility markets.

8.1.2. Future Outlook for Emerging and Developing Economies

The evolving financial landscape, digital asset adoption, and green finance trends present new opportunities and risks for FPI in EDEs. Future research should investigate the integration of fintech solutions, digital currencies, and sustainable investment strategies in managing exchange rate volatility.

By implementing targeted reforms and data-driven policies, emerging economies can enhance capital flow stability and attract long-term investment, ensuring sustainable economic growth.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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