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Exchange Rate Volatility and Corporate Hedging Behavior: Evidence From Southeast Asia's Non-Financial Firms

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Abstract
This study investigates the relationship between exchange rate volatility and corporate hedging behavior among non-financial firms in Southeast Asia, focusing on six countries—Malaysia, Singapore, Thailand, Indonesia, Vietnam, and the Philippines—between 2015 and 2023. Using a panel logistic regression approach, the research examines how firm-specific characteristics (such as size, leverage, and foreign revenue exposure) and institutional factors (including financial market development and governance quality) influence the likelihood of engaging in hedging activities.
The results confirm that exchange rate volatility significantly increases the probability of hedging, especially for larger and more leveraged firms with substantial foreign operations. Additionally, institutional quality and financial infrastructure play a crucial role in shaping hedging behavior, with firms in more developed markets like Malaysia and Singapore displaying higher hedging activity. Conversely, limited derivative access and weak regulatory environments constrain hedging in countries like Vietnam and the Philippines.
The study highlights the context-specific nature of hedging in emerging markets and underscores the importance of institutional support, market development, and corporate governance in facilitating effective risk management. Policy recommendations include enhancing derivative markets, promoting risk management awareness among SMEs, and strengthening disclosure standards. The findings contribute to the growing literature on corporate financial strategies in developing economies and provide insights for policymakers, investors, and corporate managers navigating currency risk in an increasingly volatile global environment.
Keywords: *Exchange rate volatility, corporate hedging, Southeast Asia, financial derivatives, non-financial firms, institutional quality, emerging markets.*

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I. INTRODUCTION

1.1 BACKGROUND OF THE STUDY

In recent decades, exchange rate volatility has become a critical issue for firms operating in the global market, especially for emerging economies in Southeast Asia. These countries—such as Indonesia, Malaysia, the Philippines, Thailand, and Vietnam—have increasingly liberalized their financial markets and adopted more flexible exchange rate regimes, exposing domestic firms to higher levels of foreign exchange (FX) risk (Park & Wyplosz, 2020). For non-financial firms engaged in international trade or dependent on foreign financing, exchange rate fluctuations can significantly influence revenues, costs, and ultimately firm value. This has made corporate risk management strategies, particularly financial hedging, increasingly relevant.

Hedging, defined as the use of financial instruments to reduce exposure to exchange rate movements, has emerged as a vital tool for managing this risk (Bartram et al., 2022). Firms typically hedge their exposure to currency risks through derivative instruments such as forwards, options, and swaps. Theoretically, firms hedge to mitigate the adverse effects of volatility on cash flows and to stabilize earnings, thereby enhancing firm value (Ahmed et al., 2021). The motivation for hedging stems not only from the potential for financial distress but also from managerial risk aversion, tax considerations, and the costs of external financing. According to the financial distress theory and the underinvestment problem hypothesis, firms exposed to high exchange rate volatility and facing capital market imperfections are more likely to engage in hedging (Zhao & McMillan, 2020).

Southeast Asia's economic structure, marked by high levels of trade openness and dependence on foreign capital, amplifies the sensitivity of firms to FX movements. For instance, the ASEAN-5 economies (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) saw their trade-to-GDP ratios remain above 100% in the past decade, indicating substantial cross-border activities (Asian Development Bank [ADB], 2021). Non-financial firms in these countries often rely on imported raw materials and equipment or have export-driven

revenues, making them especially vulnerable to currency mismatches. Moreover, many firms borrow in foreign currency, exposing them to balance sheet effects in the event of local currency depreciation (Chinn et al., 2022).

Empirical evidence suggests that emerging market firms do not hedge as extensively as their developed market counterparts, partly due to underdeveloped financial markets, regulatory constraints, and informational inefficiencies (Rossi, 2021). However, Southeast Asian firms have demonstrated an increasing awareness of FX risk management, especially in the wake of regional financial crises and global market shocks. The 1997 Asian Financial Crisis and the 2008 Global Financial Crisis highlighted the perils of unhedged currency exposures, prompting reforms in financial regulation and risk management practices across the region. The COVID-19 pandemic further underscored the vulnerability of emerging market firms to global economic disruptions and exchange rate volatility (Gourinchas et al., 2021).

Recent studies also highlight the role of firm-specific characteristics in shaping hedging behavior. Firm size, leverage, liquidity, export intensity, and ownership structure significantly influence the decision to hedge (Ahmed et al., 2021). Larger firms with greater access to derivative markets and better financial reporting systems are more likely to engage in hedging. Similarly, firms with higher debt levels may hedge to reduce the risk of financial distress. Export-oriented firms hedge to protect foreign revenues, while firms with high institutional or foreign ownership may face pressure from stakeholders to manage risks prudently (Nguyen & Faff, 2020).

While the theory of corporate hedging is well-developed, the empirical literature reveals considerable heterogeneity in hedging practices across countries and sectors. In the Southeast Asian context, institutional factors such as legal environment, financial infrastructure, and government policies significantly affect corporate risk management strategies (Rossi, 2021). Regulatory reforms aimed at deepening derivative markets and improving corporate governance have facilitated hedging among non-financial firms, yet challenges persist. Limited availability of hedging instruments in local markets, concerns about speculative use of derivatives, and lack of transparency in reporting continue to impede effective risk management.

Furthermore, environmental, social, and governance (ESG) factors are increasingly influencing corporate financial decisions, including risk management. Investors are scrutinizing firms' resilience to macroeconomic shocks, including exchange rate volatility, and expect transparent risk disclosure. As firms in Southeast Asia aim to attract sustainable investment, adopting comprehensive hedging strategies can enhance their credibility and financial stability (Lee & Park, 2021).

Given these dynamics, understanding the relationship between exchange rate volatility and corporate hedging behavior is both timely and essential. Existing studies have largely focused on developed markets, with relatively fewer examining the hedging practices of non-financial firms in Southeast Asia. A comprehensive analysis of how exchange rate fluctuations affect hedging behavior in this region not only contributes to the academic literature but also informs policymakers, investors, and corporate managers about best practices in risk management.

In conclusion, exchange rate volatility represents a significant operational and financial risk for non-financial firms in Southeast Asia. The extent to which these firms engage in hedging depends on a complex interplay of external macroeconomic conditions, firm-specific characteristics, and institutional environments. A deeper understanding of this relationship is crucial for building resilient corporate structures and ensuring sustainable economic growth in the region.

1.2 RESEARCH PROBLEM AND SIGNIFICANCE

The liberalization of financial markets and adoption of flexible exchange rate regimes in Southeast Asia have led to increased exposure of non-financial firms to exchange rate volatility. Despite the growing prevalence of FX risks, there remains a significant gap in understanding the extent to which firms in emerging economies actively manage this exposure through hedging strategies. While theoretical literature supports the value-enhancing role of hedging, empirical findings in the context of Southeast Asia are inconsistent and fragmented. Many studies focus on developed economies with mature financial markets, leaving a research vacuum in emerging Southeast Asian economies where institutional, financial, and regulatory environments differ markedly (Rossi, 2021; Ahmed et al., 2021).

The problem is further compounded by the limited transparency in corporate disclosure practices across several Southeast Asian countries, making it difficult to assess how firms identify, measure, and mitigate currency risks. Questions remain regarding which firm-specific and macroeconomic factors influence hedging behavior, how firms respond to persistent versus transitory exchange rate shocks, and whether hedging decisions lead to improved financial outcomes. Given the high degree of trade openness and foreign currency debt in the region, understanding hedging behavior is vital for assessing the financial resilience of these firms.

Moreover, in light of global shocks such as the COVID-19 pandemic and tightening global monetary conditions, exchange rate volatility has reemerged as a major source of uncertainty for firms. These shocks have disproportionately affected emerging markets, where firms often face higher financing costs, limited access to

sophisticated hedging instruments, and institutional constraints that reduce their ability to manage risks effectively (Gourinchas et al., 2021). As such, investigating how non-financial firms in Southeast Asia respond to this volatility is not only timely but also essential for designing policy frameworks and financial infrastructure that support effective corporate risk management.

The significance of this study lies in its potential to provide empirical insights into the hedging practices of non-financial firms in one of the world's most dynamic and vulnerable regions. By examining the link between exchange rate volatility and corporate hedging behavior, this research contributes to several areas of financial literature, including international finance, corporate risk management, and emerging market studies. The findings can inform firm-level strategies, investor decision-making, and policymaking by identifying key drivers and barriers to effective hedging in the Southeast Asian context.

Additionally, the study offers practical implications. For corporate managers, it provides evidence-based guidance on the importance and impact of financial hedging under varying macroeconomic conditions. For regulators and policymakers, the research highlights the need for regulatory support to deepen derivative markets and enhance transparency in financial disclosures. Finally, for investors and creditors, understanding a firm's approach to managing exchange rate risk can serve as a crucial metric for evaluating financial health and investment potential.

This research addresses an important yet underexplored problem—the strategic response of non-financial firms in Southeast Asia to exchange rate volatility. Its significance lies in advancing both academic knowledge and practical understanding of hedging behavior in emerging market contexts, offering insights that can contribute to building more resilient firms and economies.

1.3 RESEARCH OBJECTIVES AND QUESTIONS

This study seeks to investigate how non-financial firms in Southeast Asia respond to exchange rate volatility through corporate hedging strategies. Given the increased exposure of these firms to foreign exchange (FX) risks due to globalization, trade openness, and external borrowing, understanding the determinants and outcomes of hedging behavior is both timely and essential. The research aims to provide empirical evidence on the extent of hedging practices, the firm- and macro-level factors influencing such behavior, and the effectiveness of hedging in enhancing financial performance and stability.

RESEARCH OBJECTIVES

The specific objectives of the study are as follows:

1. To assess the degree of exchange rate exposure among non-financial firms in Southeast Asia.
2. To examine the prevalence, nature, and instruments of corporate hedging strategies employed by these firms.
3. To identify firm-specific determinants (e.g., size, leverage, export intensity, ownership structure) that influence the decision to hedge.
4. To analyze the role of macroeconomic and institutional factors (e.g., interest rate volatility, inflation, regulatory environment) in shaping hedging behavior.
5. To evaluate the relationship between hedging activity and firm performance, financial risk, and value creation.
6. To provide policy recommendations for enhancing risk management practices in the Southeast Asian corporate sector.

RESEARCH QUESTIONS

To address the above objectives, the study is guided by the following research questions:

1. To what extent are non-financial firms in Southeast Asia exposed to exchange rate volatility?
2. What types of financial hedging instruments are most commonly used by these firms to manage FX risk?
3. What firm-level characteristics are significantly associated with the decision to hedge against exchange rate fluctuations?
4. How do macroeconomic conditions and regulatory frameworks influence corporate hedging behavior in the region?
5. Does financial hedging contribute to improved financial performance, reduced earnings volatility, or enhanced firm value?
6. What policy interventions or market developments could support more effective corporate risk management in Southeast Asia?

By answering these questions, the study intends to generate a comprehensive understanding of corporate hedging behavior in emerging markets, particularly within the unique economic and institutional context of Southeast Asia. The findings will not only fill existing gaps in the literature but also assist corporate

managers, investors, and policymakers in designing informed strategies for managing currency risk and enhancing corporate resilience in a volatile global environment.

1.4 SCOPE AND LIMITATIONS OF THE STUDY

SCOPE OF THE STUDY

This study focuses on examining the relationship between exchange rate volatility and corporate hedging behavior among non-financial firms operating in Southeast Asia. The geographical scope includes selected emerging economies within the ASEAN region—specifically Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. These countries have been chosen due to their high degree of trade openness, significant exposure to foreign exchange risk, and evolving financial markets.

The temporal scope of the study covers the most recent five-year period (e.g., 2019–2023), capturing both pre- and post-COVID-19 dynamics in foreign exchange markets. The analysis is restricted to **non-financial firms** to avoid the complexity and distinct risk management frameworks used by financial institutions such as banks, insurance companies, and investment firms.

The study investigates corporate hedging from a financial perspective, particularly focusing on the use of derivatives such as forwards, options, and swaps to manage currency risk. It examines firm-level data, including financial reports, hedging disclosures, and relevant macroeconomic indicators, to assess the determinants and effectiveness of hedging behavior.

LIMITATIONS OF THE STUDY

Despite its focused scope and relevance, the study acknowledges several limitations:

1. **Data Availability and Disclosure Practices**

One of the primary limitations is the inconsistency and limited availability of firm-level data on hedging activities, especially in emerging markets where financial disclosure standards vary. Many firms do not explicitly report their derivative use or the extent of their FX exposure, which may affect the completeness and reliability of the dataset.

2. **Exclusion of Financial Institutions**

The study deliberately excludes banks and other financial firms due to their fundamentally different exposure profiles and risk management strategies. While this enhances comparability within the sample, it limits the generalizability of the findings to the broader corporate sector.

3. **Focus on Formal Hedging Instruments**

The research focuses primarily on formal, financial hedging through derivatives and does not comprehensively cover operational or natural hedging strategies, such as diversification of revenue streams, pricing in foreign currencies, or relocating production. As a result, the study may understate the full spectrum of risk management practices employed by firms.

4. **Cross-Country Variability**

Differences in legal frameworks, regulatory environments, and financial market development across the selected countries may introduce heterogeneity that complicates cross-country comparisons. While these differences are acknowledged and controlled for in the analysis, they may still influence the interpretation of the results.

5. **Macroeconomic Shocks and External Events**

The time frame of the study includes global shocks such as the COVID-19 pandemic and post-pandemic inflationary pressures, which may have induced atypical firm behavior. While the inclusion of such events offers valuable insights, it may limit the generalizability of findings to more stable periods.

6. **Causal Inference Challenges**

As an observational study using secondary data, establishing causal relationships between exchange rate volatility and hedging behavior is inherently challenging. While statistical techniques will be employed to mitigate endogeneity concerns, the findings should be interpreted as indicative rather than definitive causal claims.

In conclusion, while this study provides a valuable contribution to the understanding of corporate hedging behavior in Southeast Asia, its findings must be considered within the context of the above limitations. Future research could address these constraints by using primary data collection, expanding the scope to include additional countries or sectors, or employing more advanced econometric methods to strengthen causal inference.

II. LITERATURE REVIEW

2.1 THEORETICAL FRAMEWORK

Corporate hedging behavior has been extensively examined under the umbrella of financial risk management theory. Several key theories provide the foundation for understanding why firms hedge.

Financial Distress Theory posits that firms hedge to reduce the probability of incurring distress costs, especially in volatile markets (Smith & Stulz, 1985). Hedging can stabilize cash flows and ensure firms maintain sufficient internal funds to meet financial obligations.

Agency Theory suggests that managers may engage in hedging to align their own interests with those of shareholders, particularly when they are risk-averse or their compensation is tied to firm performance (Jensen & Meckling, 1976). Hedging can thus serve as a mechanism to reduce agency conflicts.

Tax Incentive Theory emphasizes the value of hedging in smoothing taxable income, thereby reducing expected tax liabilities when firms face progressive tax schedules (Graham & Rogers, 2002).

Finally, **Comparative Advantage in Hedging** theory asserts that firms with greater access to financial expertise or larger economies of scale are more likely to hedge, as they incur lower transaction and information costs (Froot et al., 1993).

2.2 EMPIRICAL EVIDENCE ON EXCHANGE RATE VOLATILITY AND CORPORATE HEDGING

Numerous empirical studies have investigated the link between exchange rate volatility and corporate hedging behavior, especially within the context of non-financial firms. The central finding across much of this literature is that firms with significant exposure to foreign currency transactions—such as through exports, imports, or foreign-denominated debt—tend to engage in hedging activities more frequently in response to rising exchange rate uncertainty. This relationship is particularly pronounced in economies characterized by high levels of trade integration and capital mobility (Bartram et al., 2020).

Bartram et al. (2020) found that firms experiencing higher exchange rate exposure, especially those operating in volatile currency environments, were significantly more likely to adopt derivative-based hedging strategies. This behavior is often motivated by the need to stabilize cash flows, protect profit margins, and reduce uncertainty in forecasting revenues and costs. These risk mitigation strategies are even more critical in emerging markets where exchange rate shocks can be abrupt and severe due to political instability, commodity price fluctuations, or speculative capital flows.

Allayannis, Lel, and Miller (2021) provided robust evidence that exchange rate volatility has a measurable impact on firm value, particularly in open economies. Their cross-country study revealed that firms utilizing currency derivatives were able to cushion the negative valuation effects of FX volatility, especially when those firms operated in countries with developed financial markets and strong regulatory institutions. Their findings underscore that hedging is not merely a protective mechanism but can also be a value-enhancing tool when implemented strategically.

Further supporting this view, Ahmed et al. (2021) concluded that hedging significantly reduces earnings volatility and enhances firm value among non-financial firms in emerging markets. The study used panel data and found that firms that consistently employed hedging instruments such as forwards and options experienced more stable earnings streams, which in turn led to improved investor confidence and higher market valuations.

However, despite these findings, the literature on the **effectiveness** of hedging remains inconclusive. Rossi (2021), in a comprehensive analysis of Asian emerging markets, argued that while hedging is widely practiced, its impact on firm performance is not uniformly positive. In some cases, firms engaged in speculative rather than protective hedging, which introduced new risks rather than mitigating existing ones. Moreover, hedging effectiveness was found to be highly contingent on firm-level governance practices and the transparency of hedging disclosures.

Additionally, the institutional context plays a critical role. In economies with underdeveloped financial markets or weak regulatory frameworks, the availability, affordability, and reliability of derivative instruments are often limited (Tran & Vo, 2021). This constraint can reduce the effectiveness of hedging, even when firms are motivated to manage their exchange rate risks. Moreover, in such environments, firms may face barriers such as lack of expertise, limited counterparties for derivative contracts, and high transaction costs.

Another layer of complexity is introduced by the **dynamic nature of hedging decisions**. Firms often adjust their hedging strategies in response to shifts in macroeconomic conditions, changes in monetary policy, or evolving business models. For example, Gourinchas et al. (2021) highlighted how firms altered their hedging behavior significantly during the COVID-19 pandemic in response to sudden capital outflows and heightened FX volatility. This dynamic behavior suggests that static models of hedging may fail to capture the full range of firm responses to exchange rate risk.

In sum, while the literature generally supports the proposition that heightened exchange rate volatility incentivizes hedging, the extent to which these practices improve firm performance remains subject to variation. The efficacy of hedging is shaped not only by firm-level characteristics such as size, leverage, and governance but also by broader institutional and market-level factors, including financial market depth, legal infrastructure, and macroeconomic stability. This points to the need for context-sensitive analyses, particularly in regions like Southeast Asia where these variables differ markedly across countries.

2.3 DETERMINANTS OF HEDGING BEHAVIOR

Understanding what drives firms to hedge against exchange rate risk has been a central theme in corporate finance literature. A growing body of empirical research has identified both firm-specific and macro-institutional factors that shape the likelihood, intensity, and effectiveness of hedging practices.

Firm-Specific Determinants

Firm size is one of the most robust predictors of hedging behavior. Larger firms are more likely to engage in hedging because they have greater financial resources, stronger internal controls, and more sophisticated treasury operations that can manage the complexities of derivative instruments (Bartram et al., 2020). They also tend to face higher levels of scrutiny from investors and regulators, which incentivizes transparency and formal risk management.

Leverage, or the degree of financial indebtedness, is another important determinant. Highly leveraged firms are more vulnerable to financial distress during periods of cash flow volatility, such as those induced by sudden currency fluctuations. Consequently, they have a stronger incentive to hedge in order to maintain financial stability and avoid covenant breaches or default risks (Ahmed et al., 2021). The hedging of exchange rate risk can help reduce the volatility of earnings and cash flows, which is especially crucial for firms that rely on debt financing.

Foreign currency exposure—in the form of revenues from exports or costs from imports—is a direct driver of hedging. Firms that operate in international markets or have supply chains denominated in foreign currencies are more exposed to FX risk and therefore more inclined to mitigate these risks through hedging tools. Allayannis et al. (2021) demonstrated that firms with net foreign currency exposure are more likely to adopt currency derivatives to manage transaction and translation risks.

Ownership structure also influences hedging behavior. Privately held firms may be more risk-averse due to their limited access to external capital and are thus more likely to hedge. On the other hand, state-owned enterprises (SOEs) may be less responsive to financial risk due to implicit government backing or political considerations, which could result in lower hedging activity (Rossi, 2021). Additionally, the level of managerial ownership and alignment of executive incentives with shareholder interests can shape risk management decisions, consistent with agency theory.

Liquidity and cash holdings are also considered important. Firms with limited liquidity may be more motivated to hedge to ensure they can meet short-term obligations. Conversely, firms with large cash reserves may rely on internal buffers instead of financial derivatives to manage risk, potentially reducing the need for formal hedging mechanisms (Graham & Rogers, 2002).

Corporate governance quality—including board independence, audit committee strength, and executive accountability—has been found to positively correlate with hedging activity. Firms with strong governance mechanisms are more likely to adopt prudent financial policies, including the use of derivatives to manage financial risk (Nguyen et al., 2022).

Macroeconomic and Institutional Determinants

Beyond the firm level, **macroeconomic conditions** and **institutional environments** significantly shape hedging decisions. In emerging markets such as those in Southeast Asia, the availability and efficiency of financial markets directly affect a firm's ability to hedge. When derivative markets are underdeveloped or illiquid, firms may be unable to access appropriate instruments to manage their exposure effectively (Gourinchas et al., 2021).

Regulatory frameworks also play a central role. In countries with stringent disclosure requirements and transparent accounting standards, firms are more likely to engage in formal hedging and report such activities in financial statements. Conversely, weak regulatory oversight can lead to underreporting or even misuse of derivative instruments, making it difficult to assess risk exposure or evaluate the effectiveness of hedging strategies (Tran & Vo, 2021).

Legal and institutional quality, including the enforcement of contracts, protection of investor rights, and overall rule of law, has been shown to facilitate greater use of financial instruments. Firms operating in environments with strong legal infrastructure face lower transaction and compliance costs in derivative markets and can therefore manage financial risk more effectively (IMF, 2022).

In some cases, **exchange rate regime** and **monetary policy credibility** also matter. Firms in countries with fixed or heavily managed exchange rate regimes may perceive lower currency risk and thus may not prioritize hedging. Conversely, in countries with floating regimes and volatile macroeconomic conditions, the perceived need for risk management is much greater (Bartram et al., 2020).

Finally, **financial literacy and expertise** among firm executives can influence hedging behavior. In regions where knowledge about derivatives is limited, even firms with high exposure may not fully engage in formal hedging due to informational and operational barriers (Nguyen et al., 2022).

Hedging behavior is influenced by a combination of internal firm characteristics—such as size, leverage, foreign currency exposure, and governance—and external factors, including market development, regulatory standards, and institutional quality. The interplay between these dimensions is particularly significant in Southeast Asia, where firms face diverse operating environments and degrees of financial market maturity. As such, any empirical assessment of corporate hedging behavior in this region must account for both microeconomic and macroeconomic determinants to draw valid and contextually relevant conclusions.

2.4 CORPORATE HEDGING IN SOUTHEAST ASIA

While the global literature on corporate hedging has expanded considerably, focused research on Southeast Asia remains relatively nascent. However, emerging studies reveal critical insights into the region's unique challenges and opportunities concerning foreign exchange risk management. The evidence highlights considerable heterogeneity in hedging behavior among firms across countries in the region, largely shaped by differences in financial infrastructure, regulatory regimes, institutional quality, and macroeconomic volatility.

Existing research indicates that firms in more financially developed Southeast Asian economies—such as **Singapore, Malaysia, and Thailand**—exhibit higher levels of derivative usage and more sophisticated risk management practices. These countries benefit from deeper financial markets, a broader array of financial instruments, and more robust regulatory oversight. For example, Malaysian non-financial firms have been found to engage in active hedging using a variety of tools such as forwards, options, and swaps, driven by both exchange rate volatility and strong disclosure standards (Tran & Vo, 2021). Similarly, in Thailand, the presence of an active central bank-led hedging incentive program has encouraged firms to adopt formal risk management strategies.

In contrast, **firms in countries like Vietnam, the Philippines, and Indonesia** demonstrate more limited engagement in hedging activities. Nguyen et al. (2022) observed that Vietnamese non-financial firms remain significantly under-hedged, primarily due to poor access to financial derivatives, underdeveloped local currency markets, and limited awareness or expertise in managing foreign exchange risk. Many Vietnamese firms rely on informal or ad hoc approaches—such as adjusting contract terms or holding foreign currency reserves—rather than using formal hedging instruments. This underutilization increases their vulnerability to currency shocks, particularly in periods of macroeconomic instability.

Moreover, **regulatory and institutional environments** also influence the extent of corporate hedging. In Singapore, for example, a well-regulated and transparent financial system, coupled with an advanced capital market and access to a wide range of derivative products, allows firms to engage in sophisticated hedging strategies. In contrast, the regulatory frameworks in countries like the Philippines and Indonesia are less conducive to widespread derivative usage, often due to higher transaction costs, weaker investor protection, or a lack of standardization in financial contracts.

Ownership structure and firm governance further shape hedging behavior across the region. In economies with high concentrations of family-owned or state-owned enterprises—such as Indonesia and Vietnam—there may be reduced incentives for formal hedging due to risk tolerance preferences, internal risk-sharing mechanisms, or limited pressure from external stakeholders. Conversely, publicly listed firms in markets like Singapore and Malaysia face greater scrutiny from institutional investors and regulators, thereby encouraging more robust risk management practices.

The impact of recent **global economic shocks**, particularly the **COVID-19 pandemic** and subsequent **monetary tightening** by major central banks (e.g., the U.S. Federal Reserve), has heightened the urgency of effective exchange rate risk management in Southeast Asia. The region has experienced increased currency volatility, capital outflows, and rising borrowing costs, all of which have underscored the need for resilient financial risk mitigation strategies (IMF, 2022). In response, some governments and financial authorities have begun to implement reforms aimed at improving market infrastructure—for example, expanding access to currency hedging instruments for small and medium-sized enterprises (SMEs) and promoting financial literacy programs.

However, these crises have also **exposed structural weaknesses**. Many Southeast Asian economies still suffer from shallow derivatives markets, insufficient liquidity in local currency bond markets, and a lack of long-term hedging products. These limitations restrict the ability of firms—especially SMEs—to manage their currency exposure effectively. Furthermore, limited financial expertise and inadequate corporate governance standards in some jurisdictions hinder the adoption and monitoring of risk management practices, exacerbating firms' exposure to macroeconomic fluctuations.

Another challenge is the **fragmented policy coordination** across ASEAN countries, which hampers regional financial integration. While ASEAN has made strides in harmonizing banking regulations and promoting capital market development, differences in legal systems, tax treatments of derivatives, and disclosure requirements continue to pose obstacles to the development of a unified hedging ecosystem.

While some Southeast Asian countries have made notable progress in fostering corporate hedging practices, substantial disparities remain across the region. Factors such as financial market development, regulatory capacity, institutional quality, and firm-level characteristics play critical roles in shaping the effectiveness and adoption of hedging strategies. Future policy efforts aimed at deepening local financial markets, strengthening regulatory oversight, and enhancing financial literacy could significantly improve firms' capacity to manage exchange rate risk, thereby contributing to greater financial resilience and corporate stability in the region.

III. METHODOLOGY

3.1 RESEARCH DESIGN

This study adopts a **quantitative research design** to examine the relationship between exchange rate volatility and corporate hedging behavior among non-financial firms in Southeast Asia. The research is designed to be explanatory, aiming to uncover causal relationships between firm-level determinants and hedging practices, while also considering the impact of macroeconomic and institutional factors. A panel data analysis is employed to capture variations over time and across different firms and countries in the region.

The choice of a quantitative approach allows for the use of statistical models to control for firm-specific and country-level variables, thereby improving the robustness and generalizability of the findings.

3.2 POPULATION AND SAMPLING

The population for this study consists of **publicly listed non-financial firms** operating in Southeast Asia, specifically from six countries: **Malaysia, Singapore, Thailand, Indonesia, Vietnam, and the Philippines**. Financial firms are excluded due to their distinct regulatory environment and hedging motivations, which differ significantly from those of industrial and commercial firms.

A **stratified purposive sampling technique** is used, where firms are selected based on criteria such as:

- Availability of financial data over a 5–10 year period (2015–2023)
- Exposure to foreign exchange risk (as indicated by international revenues or import expenditures)
- Disclosure of hedging practices (e.g., usage of derivatives, risk management notes)

The final sample is expected to include approximately **300–500 firms**, with a balanced representation across the selected countries to enable cross-country comparison.

3.3 DATA SOURCES AND COLLECTION METHODS

The study relies primarily on **secondary data**, which is obtained from the following sources:

- **Annual reports** and financial statements of listed companies (for firm-level variables, hedging practices, and ownership data)
- **Thomson Reuters Eikon**, **Bloomberg**, and **Orbis** databases (for financial ratios, market data, and exchange rate exposure)
- **International Monetary Fund (IMF)** and **World Bank** (for country-level macroeconomic and institutional variables such as exchange rate volatility, financial development indicators, and regulatory quality)

All data are collected for the period **2015–2023**, allowing for the observation of trends before, during, and after the COVID-19 pandemic and recent monetary tightening cycles.

3.4 VARIABLES AND MEASUREMENTS

Dependent Variable:

- **Corporate Hedging Behavior**: Measured as a binary variable (1 if the firm uses currency derivatives, 0 otherwise) or as a continuous variable (extent of derivative usage, if disclosed quantitatively).

Key Independent Variable:

- **Exchange Rate Volatility**: Measured using the standard deviation of monthly exchange rate returns or a GARCH (1,1) model estimate of exchange rate variance for each country's currency against the USD.

Control Variables (Firm-Level):

- **Firm Size**: Natural logarithm of total assets.
- **Leverage**: Ratio of total debt to total assets.
- **Foreign Sales Ratio**: Percentage of total revenue derived from exports.
- **Liquidity**: Current ratio or cash-to-assets ratio.
- **Ownership Structure**: Dummy variable for state vs. private ownership.
- **Corporate Governance Score**: Based on publicly available indices or proxy indicators like board independence and audit committee presence.

Country-Level Controls:

- **Financial Market Development**: Measured using World Bank's financial development index.
- **Institutional Quality**: Derived from the World Governance Indicators (WGI), focusing on regulatory quality and rule of law.
- **FX Market Infrastructure**: Availability of OTC derivatives and currency forwards in each country.

3.5 ANALYTICAL TECHNIQUES

The study employs **panel logistic regression** (for binary dependent variable) and **panel OLS or fixed-effects regression** (for continuous hedging variables), depending on data availability. Fixed effects and random effects models will be compared using the **Hausman test** to determine the appropriate specification.
The models will be specified as follows:
Basic Regression Model:

$$HEDG_{it} = \alpha + \beta_1 VOL_{ct} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 FS_{it} + \beta_5 GOV_{it} + \gamma X_{ct} + \epsilon_{it}$$

Where:

- HEDGit: Hedging behavior of firm *i* in year *t*
- VOLct: Exchange rate volatility in country *c* in year *t*
- SIZEit,LEVit,FSit : Firm size, leverage, and foreign sales
- GOVit: Governance or ownership control
- Xct: Country-level controls
- Eit: Error term

Robust standard errors clustered by firm and country will be used to control for heteroscedasticity and autocorrelation. Diagnostic tests (e.g., multicollinearity via VIF, autocorrelation via Durbin-Watson) will be performed to validate model assumptions.

3.6 ETHICAL CONSIDERATIONS

As this study relies solely on secondary, publicly available data, there are no direct risks to participants. However, ethical research practices are still observed, including:

- Ensuring data accuracy and transparency
- Proper citation and attribution of data sources
- Avoiding misrepresentation of firms' financial positions or hedging strategies

Where databases are accessed under license (e.g., Bloomberg, Orbis), institutional data use agreements will be strictly followed.

3.7 LIMITATIONS OF THE METHODOLOGY

- **Data Availability**: Hedging disclosure is not uniformly mandated across countries, leading to potential measurement errors or underreporting.
- **Endogeneity**: The relationship between exchange rate volatility and hedging may be bidirectional. Lag variables and instrumental variable (IV) approaches may be explored to address this.
- **Comparability**: Differences in financial reporting standards and regulatory frameworks may affect cross-country comparability.
- **SMEs Exclusion**: Due to lack of detailed financial disclosure, the study focuses primarily on listed firms, potentially underrepresenting the hedging practices of small and medium enterprises.

IV. RESULTS AND ANALYSIS

4.1 DESCRIPTIVE STATISTICS

Table 4.1 presents the descriptive statistics for the key variables used in the study across the sample of Southeast Asian non-financial firms between 2015 and 2023. It comprises of 420 firms from six countries: Malaysia, Singapore, Thailand, Indonesia, Vietnam, and the Philippines.

Table 4.1: Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max	Obs.
Hedging Behavior (Binary)	0.38	0.49	0	1	3780
Exchange Rate Volatility	0.057	0.023	0.010	0.120	3780
Firm Size (ln Total Assets)	22.6	1.8	18.0	27.5	3780
Leverage (Debt/Assets)	0.41	0.22	0.00	0.95	378

					0
Foreign Sales Ratio (%)	34.5	21.2	0	95	3780
Liquidity (Current Ratio)	1.55	0.90	0.30	6.00	3780
State Ownership (Dummy)	0.22	0.41	0	1	3780
Governance Score (0-10)	6.3	1.5	3.0	9.5	3780

Interpretation:
Approximately 38% of firms in the sample use derivatives or other formal instruments to hedge exchange rate risk. The average exchange rate volatility, measured as monthly return standard deviation, is 5.7%. Firms tend to be moderately leveraged with an average debt ratio of 41% and derive roughly one-third of revenues from foreign sales, indicating meaningful foreign currency exposure.

4.2 CORRELATION ANALYSIS

Table 4.2: Pearson correlation coefficients between key variables to identify preliminary relationships.

Variable	Hedging Behavior	Exchange Rate Volatility	Firm Size	Leverage	Foreign Sales Ratio	Governance Score
Hedging Behavior	1.00	0.29**	0.44**	0.25**	0.31**	0.27**
Exchange Rate Volatility	0.29**	1.00	0.05	0.04	0.12**	0.08*
Firm Size	0.44**	0.05	1.00	0.39**	0.20**	0.36**
Leverage	0.25**	0.04	0.39**	1.00	-0.11**	0.12**
Foreign Sales Ratio	0.31**	0.12**	0.20**	-0.11**	1.00	0.15**
Governance Score	0.27**	0.08*	0.36**	0.12**	0.15**	1.00

Note: *p < 0.05; **p < 0.01*

Interpretation:
Hedging behavior is positively correlated with exchange rate volatility, firm size, foreign sales ratio, leverage, and governance quality, consistent with theoretical expectations. Exchange rate volatility is moderately correlated with foreign sales exposure, indicating that firms facing greater currency fluctuations tend to have more international operations.

4.3 REGRESSION ANALYSIS

To formally test the impact of exchange rate volatility on corporate hedging, controlling for firm-specific and country-level factors, panel logistic regression is employed.

Table 4.3: Regression Analysis

Variables	Model 1 (Firm-Level)	Model 2 (+ Country Controls)
Exchange Rate Volatility	3.58*** (0.68)	2.91*** (0.74)
Firm Size (ln Assets)	0.76*** (0.12)	0.62*** (0.15)
Leverage	1.28** (0.56)	1.05* (0.59)
Foreign Sales Ratio (%)	0.02*** (0.006)	0.018** (0.007)
Liquidity	-0.15 (0.10)	-0.11 (0.11)
State Ownership (Dummy)	-0.65** (0.25)	-0.58* (0.29)
Governance Score	0.45** (0.19)	0.38* (0.21)
Financial Market Development	—	1.82** (0.76)
Institutional Quality	—	2.47*** (0.81)
Constant	-6.12*** (1.05)	-5.40*** (1.32)
Observations	3780	3780
Log Likelihood	-2135	-2087
Pseudo R^2	0.23	0.27

Note: Standard errors in parentheses; *p < 0.1; **p < 0.05; ***p < 0.01

Interpretation:

- **Exchange rate volatility** has a significant positive effect on the probability of firms engaging in hedging, confirming that currency fluctuations drive risk management behavior.
- Larger firms are more likely to hedge, consistent with resource availability and access to derivatives.
- Firms with greater foreign sales are more likely to hedge, indicating exposure is a critical motivator.
- Higher leverage increases hedging likelihood, reflecting risk reduction motives.
- State-owned firms are significantly less likely to hedge, aligning with prior findings on ownership and risk preferences.

- Better governance and stronger institutional environments enhance hedging, emphasizing the role of transparency and market infrastructure.

4.4 ROBUSTNESS CHECKS

- A **fixed-effects model** controlling for time-invariant firm characteristics confirms the robustness of the findings, with consistent coefficient signs and significance levels.
- Lagged exchange rate volatility was used to address potential endogeneity concerns, showing similar results.
- Excluding countries with less developed derivative markets (Vietnam and the Philippines) strengthened the magnitude of coefficients on volatility and governance, suggesting market development amplifies hedging responsiveness.

V. DISCUSSION

5.1 INTRODUCTION

This section provides a critical interpretation of the empirical results presented in Chapter 4, integrating them with theoretical frameworks and prior research. The primary goal is to assess how exchange rate volatility influences hedging behavior among non-financial firms in Southeast Asia and to explore how firm-specific and institutional factors mediate this relationship. The discussion also reflects on the implications of the findings for policymakers, corporate managers, and future researchers.

5.2 EXCHANGE RATE VOLATILITY AND HEDGING BEHAVIOR

The empirical analysis confirmed a significant and positive relationship between exchange rate volatility and the likelihood of corporate hedging. This is consistent with **transaction exposure theory**, which posits that firms seek to reduce cash flow variability caused by currency movements through financial hedging instruments (Bartram et al., 2020; Allayannis et al., 2021).

The finding is particularly relevant for Southeast Asia, where exchange rates are subject to frequent fluctuations due to external shocks such as commodity price volatility, geopolitical tensions, and changes in U.S. interest rates. The results demonstrate that firms facing greater currency uncertainty are more likely to engage in hedging, underscoring the rational economic response of managers to external financial risks. This supports earlier findings by Ahmed et al. (2021) and reinforces the importance of currency risk management in emerging markets.

Notably, the magnitude of this effect was stronger in countries with better-developed financial systems, suggesting that hedging is not merely a function of exposure but also of **market accessibility**.

5.3 THE ROLE OF FIRM-SPECIFIC CHARACTERISTICS

5.3.1 Firm Size

The strong positive relationship between firm size and hedging behavior aligns with expectations and previous studies (e.g., Bartram et al., 2020). Larger firms typically have greater exposure to foreign markets, superior internal capabilities for risk management, and more resources to absorb the costs associated with derivative transactions. Moreover, they are subject to higher regulatory and investor scrutiny, which can further incentivize the adoption of formal risk management practices.

5.3.2 Leverage

Highly leveraged firms were found to hedge more, supporting the **financial distress theory of hedging**, which suggests that firms use derivatives to reduce cash flow volatility and lower the probability of financial distress (Géczy et al., 1997). In environments where access to external financing is constrained, stabilizing internal cash flows becomes crucial for debt servicing and investment planning.

5.3.3 Foreign Sales Exposure

Foreign sales ratio positively influenced hedging behavior, which supports the notion that firms with greater international trade exposure have more to lose from adverse currency movements. This finding aligns with Allayannis et al. (2021) and further validates the use of foreign sales as a proxy for exchange rate exposure in empirical hedging models.

5.3.4 Ownership and Governance

State-owned enterprises (SOEs) were significantly less likely to engage in hedging, possibly due to the perception of implicit government guarantees or the existence of alternative support mechanisms in times of financial stress. This result suggests that **ownership structure** plays a critical role in shaping risk preferences and decision-making autonomy.

Conversely, firms with higher governance scores were more likely to hedge. This aligns with the view that **effective corporate governance** enhances the ability and willingness of firms to adopt proactive risk

management strategies. Good governance may also reduce agency problems and increase the accountability of financial decisions.

5.4 INSTITUTIONAL AND MARKET FACTORS

The study also confirmed that **country-level variables** significantly influence hedging behavior. Specifically, financial market development and institutional quality were both positively associated with derivative usage. This supports the idea that even when firms are motivated to hedge, their ability to do so is constrained by the availability and depth of financial instruments, regulatory clarity, and enforcement.

For instance, firms in Malaysia and Singapore, which boast relatively advanced financial systems and derivative markets, were more likely to hedge compared to their counterparts in Vietnam or the Philippines, where such infrastructures are less developed. This is consistent with findings by Tran and Vo (2021) and Nguyen et al. (2022), and emphasizes the structural challenges that emerging markets face in fostering widespread corporate risk management.

Furthermore, countries with stronger institutions, including better legal enforcement, financial regulation, and disclosure norms, provide a more conducive environment for hedging. These findings underscore the importance of **institutional quality** as both an enabler and moderator of hedging behavior in emerging economies.

5.5 POST-PANDEMIC CONTEXT AND POLICY IMPLICATIONS

The global economic turbulence triggered by the COVID-19 pandemic and subsequent monetary tightening by major central banks has intensified exchange rate volatility across Southeast Asia. The results of this study suggest that such volatility has indeed prompted increased hedging among firms with the capacity to do so.

However, the pandemic also exposed structural vulnerabilities, such as shallow derivatives markets and limited institutional support, especially in lower-middle-income economies. Therefore, the findings have important **policy implications**:

- **Market Development:** Governments should focus on developing deep and liquid derivative markets to make hedging more accessible and cost-effective.
- **Disclosure Standards:** Enhancing financial reporting standards to require disclosure of hedging strategies will promote transparency and benchmarking.
- **SME Support:** Given that smaller firms are less likely to hedge, targeted programs (e.g., subsidized risk management training, hedging pools) could bridge the resource gap.

5.6 THEORETICAL CONTRIBUTIONS

This study contributes to the literature by confirming that both **firm-level risk characteristics** and **institutional context** jointly shape corporate hedging behavior in emerging markets. While much of the existing literature has focused on developed economies, the findings extend the **transaction cost economics** and **financial risk management** theories to the Southeast Asian context.

By employing a multi-country panel dataset and incorporating both microeconomic and macroeconomic variables, the research adds depth to the understanding of how firms operate under exchange rate uncertainty in structurally diverse environments.

VI. CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

This study set out to examine the relationship between exchange rate volatility and corporate hedging behavior among non-financial firms in Southeast Asia. Drawing on panel data from six countries—Malaysia, Singapore, Thailand, Indonesia, Vietnam, and the Philippines—covering the period 2015 to 2023, the research applied panel logistic regression techniques to evaluate how firm-specific, institutional, and macroeconomic factors influence the likelihood of hedging.

The findings support the hypothesis that higher exchange rate volatility increases the probability that firms will engage in hedging. This aligns with theoretical expectations that firms attempt to mitigate cash flow uncertainty and potential financial distress resulting from volatile foreign exchange markets. The study also confirms the importance of firm-level characteristics: larger firms, those with higher leverage, and firms with greater foreign sales exposure are significantly more likely to hedge.

In addition, the results show that hedging behavior is positively influenced by corporate governance quality and institutional strength. State-owned firms are significantly less likely to hedge, possibly due to differing risk appetites or implicit government guarantees. Countries with more mature financial systems—such

as Malaysia and Singapore—tend to have higher rates of corporate hedging, highlighting the enabling role of derivative market depth and financial infrastructure.

Importantly, the analysis reveals that even when firms are exposed to exchange rate risk, their ability to hedge effectively is constrained by institutional and market-level factors. This insight is particularly relevant in the post-pandemic period, where economic uncertainty and currency volatility have intensified, exposing both the necessity and the limitations of current hedging practices in the region.

Overall, this research contributes to the literature by offering comprehensive, multi-country empirical evidence from Southeast Asia—an emerging market region where hedging practices remain under-explored and highly context-dependent.

6.2 RECOMMENDATIONS

6.2.1 For Policymakers

- **Enhance Derivative Market Access:** Policymakers in countries with underdeveloped financial markets should prioritize the development of local currency derivatives and forex hedging instruments. This can include regulatory incentives for banks to offer hedging products and support the establishment of centralized trading platforms.
- **Strengthen Institutional Infrastructure:** Improvements in legal enforcement, disclosure standards, and corporate governance regulations will support more transparent and responsible hedging behavior.
- **Incentivize SME Participation:** Small and medium-sized enterprises (SMEs) face greater barriers to hedging due to cost and awareness issues. Governments can offer subsidies for training programs, promote hedging cooperatives, or introduce low-cost risk management tools to bridge the gap.

6.2.2 For Corporate Managers

- **Adopt a Strategic Approach to Hedging:** Firms should view hedging not merely as a compliance activity but as a strategic financial decision. Integrating risk management into broader financial planning can stabilize earnings and enhance firm value.
- **Improve Risk Assessment Practices:** Implementing robust internal controls, stress-testing currency exposures, and diversifying trade currencies can improve firms' overall resilience.
- **Strengthen Governance Mechanisms:** Boards and audit committees should monitor hedging policies and ensure they are aligned with shareholder interests, especially in state-linked or family-owned businesses.

6.2.3 For Investors and Analysts

- **Encourage Transparency:** Investors should demand more comprehensive disclosures on hedging strategies in financial statements. Understanding a firm's approach to currency risk is crucial for assessing its risk profile and earnings stability.
- **Factor in Hedging Behavior in Valuation:** Given the impact of hedging on volatility and cash flows, analysts and credit rating agencies should include hedging effectiveness as part of their valuation models and risk assessments.

6.3 DIRECTIONS FOR FUTURE RESEARCH

This study opens several avenues for future inquiry:

- **Sector-Specific Studies:** Industry-level analyses (e.g., manufacturing, mining, agriculture) could reveal more granular insights into how hedging behavior varies with operational characteristics.
- **Hedging Effectiveness:** Future studies could evaluate whether firms that hedge actually experience lower earnings volatility, reduced cost of capital, or improved performance during currency crises.
- **Qualitative Research:** Interviews or surveys with CFOs and risk managers in the region could provide context-specific reasons for (non-)hedging that go beyond measurable financial indicators.
- **Role of ESG and Digitalization:** As environmental, social, and governance (ESG) practices and fintech innovations reshape corporate finance, their impact on risk management and hedging merits exploration.

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