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ASSESSING THE RIPPLE EFFECT: THE ECONOMY AND MONETARY POLICY OF THE UNITED STATES OF AMERICA ON ASEAN-5 STOCK MARKET DYNAMICS

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ABSTRACT

This study evaluated the impacts of the United States of America (USA) economy and monetary policy on the ASEAN-5 stock markets by analysing semiannual data from 2005 to 2023. Its primary objective is comparing the impacts across the different ASEAN-5 countries and identify additional factors contributing to stock performance beyond the macroeconomic variables of the USA. The panel autoregressive distributed lag (ARDL) approach was employed to scrutinise both long-term and short-term relationships between the ASEAN-5 stock markets and the economic variables of the USA. The gross domestic product (GDP) and monetary policy of the ASEAN-5 stock markets and the USA were also examined. It also investigated the real effective exchange rate (REER) and the relationship between the ASEAN-5 stock markets and the international trade and stock market performance of the USA**.** Findings revealed that when the USA experienced significant GDP growth, ASEAN-5 stock markets would be negatively influenced. The Federal Funds Rate of the USA produced a statistically significant and positive long-term impact. However, the REER and the USA international trade had no profound long-term impacts. USA GDP positively influenced the ASEAN-5 stock performance in the short term, with the USA Federal Funds Rate producing a negative influence. The REER demonstrated a positive short-term impact while the USA's international trade negatively impacted the ASEAN-5 stock markets. Findings have highlighted the interactions between the economic indicators of the USA and the ASEAN-5 stock markets. This insight has provided a foundation for future research into the local and global economic dynamics contributing to the performance of the ASEAN-5 stock markets. This study also underscored the importance of resilience to external shocks by illustrating the significance of economic linkages. The capability to withstand external shocks, such as financial crises or global uncertainties, could contribute to more informed decision-making and support sustainable ASEAN-5 economic growth.

Keywords: Monetary policy, Panel ARDL, ASEAN-5, U.S. economy, stock performance.

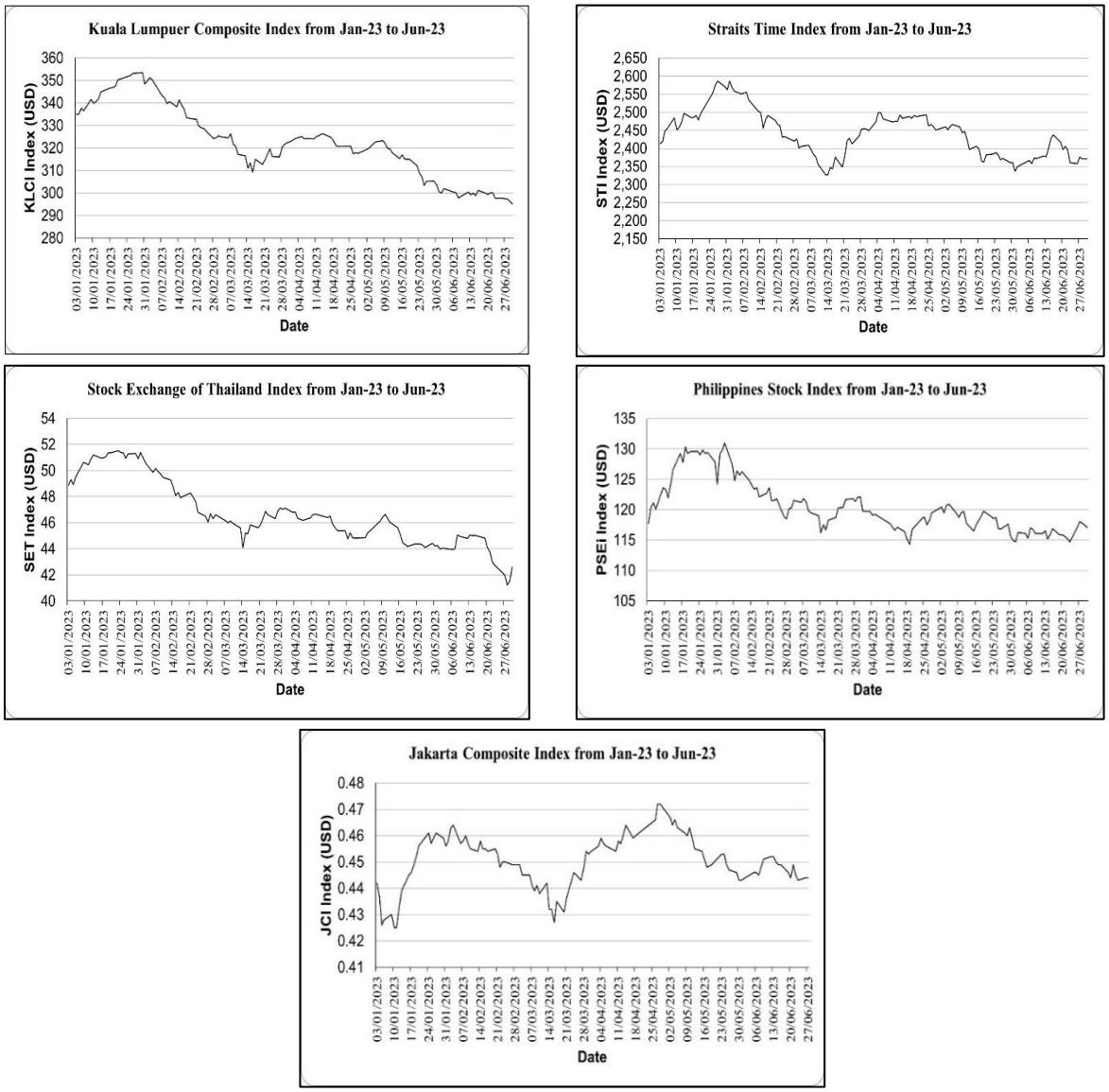
INTRODUCTION

Global financial markets are intricately connected, with economic policies and conditions in one region frequently producing profound impacts on other regions. The United States of America (USA) comprises one of the largest and most influential economies across the world and plays a pivotal role in shaping the global financial landscape (Stephane & Arthur, 2011; Kose, 2017; Jakšić, 2022). In particular, the pivotal role of the USA economy has constantly been observed among emerging markets, including the ASEAN-5 countries consisting of Malaysia, Singapore, Thailand, Indonesia, and the Philippines. The ASEAN-5 economies have observed significant growth over the past few decades and have become attractive destinations for international investors. Significant economic growth in the region has also contributed to the development of robust capital markets, which are essential for fostering economic development. Nonetheless, the ASEAN-5 markets are not immune to external shocks, especially from major economies, including the USA. Any alteration in the USA interest rates, inflation, and other macroeconomic variables can substantially impact the stock market performance of the ASEAN-5 (Lu & Hamori, 2014; Hassan et al., 2024). The interdependence between ASEAN-5 economies and global financial markets, especially the USA, has become more pronounced due to rapid globalisation and financial market integration.

The integration of ASEAN stock markets through initiatives, such as the ASEAN Exchange, has underscored the importance of understanding regional market dynamics. The exchange platform serves to promote investment opportunities and increase trading volumes across member countries. Specifically, stock exchanges in Malaysia, Singapore, Thailand, Indonesia, and the Philippines have developed various indices, including the FBM KLCI, Straits Times Index (STI), SET Index, PSEi Index, and Jakarta Composite Index (JCI), which function as indicators of market sentiments and economic health. The indices, which track the overall performance of the stock markets in these respective countries, are highly sensitive to shifts in global economic conditions, particularly the conditions significantly influenced by developed economies, including the USA. As such, investors closely monitor the indices for early signs of potential market volatility or growth, which are not only vital for tracking market performance, but also reflect broader economic conditions in the region while being sensitive to alterations in global economic conditions. Furthermore, the stock market is an essential indicator of overall economic health, which guides investor actions and predicts future economic trends. The failures of the Silicon Valley Bank in March 2023 triggered total panic and uncertainty in the USA, which resulted in substantial negative returns across global stock markets (Pandey et al., 2023). The event demonstrated that local financial crises in major economies could produce significant spillover effects on the global financial system, adversely impacting investor behaviour and market performance across continents. The event also negatively impacted the ASEAN-5 stock markets from March 10 to March 14, 2023, which led to declines in stock prices (see Figure 1). Such market uncertainties will diminish wealth, decrease consumption, and stifle economic growth.

Figure 1

Stock Market Trends in the ASEAN-5 Markets during the SVB Collapse



Notes. Source is the Eikon database, 2023

The cascading effect of global shocks is frequently compounded by existing market vulnerabilities in emerging economies, especially the ASEAN-5 markets that are relatively more volatile and less diversified, which might then amplify the negative repercussions of global financial crises. The failure of the SVB bank was partially precipitated by prior rate hikes by the USA Federal Reserve, and an event study approach uncovered negative returns across all equity sectors following the event (Wang, 2024; Yousaf & Goodell, 2023). Nevertheless, the Summary of Economic Projections (SEP) forecasted a gradual reduction in the federal fund rate, which was anticipated to decline to 4.6% in 2024, 3.6% in 2025, and 2.9% in 2026, before stabilising at 2.5%. The New York Federal Reserve also predicted a recession probability exceeding 60%. The projections produced profound implications for ASEAN-5 economies, as changes in the USA interest rate would directly influence capital flows, liquidity conditions, and investment strategies in the region. In addition, the USA and ASEAN have elevated cross-regional relationships to a comprehensive strategic partnership (CSP) in 2022 (U.S. Department

of State, 2022), which serves as a critical platform for deeper economic, political, and security collaborations, with economic integration as the key focus. The growing economic linkages between the USA and ASEAN-5 countries also emphasise the need for policymakers and investors to closely monitor the USA macroeconomic trends and potential impacts on ASEAN-5 financial markets. Simultaneously, the USA has been the largest foreign direct investor in the ASEAN region for four consecutive years beginning in 2019 (ASEAN Secretariat, 2023). The trend highlights the significance of the USA economic stability for ASEAN-5 economies, owing to the substantial foreign direct investment (FDI) of the USA in ASEAN.

The FDI is pivotal to ASEAN-5 economies due to its profound influence on economic growth and stock market performance (Vogiatzoglou & Nguyen, 2019; Organisation for Economic Co-operation and Development [OECD], 2021). The contribution of the FDI is not limited to the capital inflow. The FDI plays a central role in enhancing technological transfer, providing access to global markets, and promoting innovation in local industries. A stable USA economy with steady FDI inflows will significantly influence the long-term economic health and development prospects of the ASEAN-5 countries. As such, any USA GDP and monetary policy change will significantly impact ASEAN-5 stock markets. The USA policy actions, such as interest rate changes or fiscal policy shifts, will potentially trigger large capital flows into or out of ASEAN-5 markets, which will influence stock prices, currency values, and broader market sentiments.

The ASEAN-5 countries, which are emerging economies, are highly susceptible to global financial shifts and vulnerable to external shocks due to being open economies and requiring substantial dependence on trade. The countries have observed significant FDI in their respective stock markets, which has contributed to economic growth despite higher exposure to global financial turbulence and volatility in global financial conditions; owing to their being relatively smaller and less diversified economies compared to developed markets. Macroeconomic variables, such as interest rates, GDP growth, and inflation, in developed economies, including the USA, can create ripple effects across ASEAN-5 markets. For instance, the ASEAN-5 markets will mimic the changes in investor sentiments or capital flows when the USA Federal Reserve adjusts relevant monetary policies to maintain economic stability. Changes in U.S. interest rates may engender a shift in investor preference for the government bonds of the U.S., which offer relatively safer and higher returns amidst market uncertainties and attract capital away from ASEAN-5 stock markets.

The rise in the interest rates of the U.S. may render the U.S. bonds more attractive to international investors, which will result in capital outflows from ASEAN stock markets (Mishra et al., 2014). The capital flight could trigger a decline in stock prices and depreciation of local currencies in the ASEAN-5 markets and create additional economic challenges. The capital outflows, coupled with a stronger U.S. dollar, could also negatively impact the liquidity of ASEAN-5 markets, which further exacerbates economic pressures. Similarly, a slowdown in the U.S. economy projected in the event of a recession could precipitate negative spillover effects to ASEAN-5 stock prices and adversely influence global economic growth. The spillovers indicate the sensitivity of ASEAN-5 markets to changes in global risk sentiments, which frequently engenders heightened market volatility in the region. Additionally, the impact of U.S. macroeconomic policy on ASEAN-5 markets is magnified by the interplay between the U.S. dollar and local currencies in the ASEAN-5 countries. A stronger U.S. dollar may increase the cost of U.S. imports and negatively impact ASEAN-5 exporters due to the potentially reduced demand for ASEAN-5 goods and services. Thus, the spillover effects are significant for ASEAN-5 markets as investor behaviours are constantly driven by global risk sentiments rather than solely domestic factors. The ASEAN-5 economies are also interconnected through trade and financial markets, with a downturn

in the U.S. economy or U.S. monetary policy shifts potentially leading to decreased demand for exports from ASEAN-5 countries. As a result, a slowdown in economic growth and negative stock market performance will be observed.

The interconnectedness of global financial markets highlights the need to explore how U.S. economic conditions and monetary policies impact the ASEAN-5 stock markets in terms of the direct financial impacts and the broader economic channels through which the impacts are transmitted. Changes in U.S. economic conditions can profoundly influence inflation rates, consumer demands, and investor sentiments, which produce significant implications for ASEAN-5 economies. Accordingly, the current study aims to offer empirical evidence on the U.S. and ASEAN-5 relationship and thus, provide valuable insights for investors and policymakers. Appraising the linkages between U.S. economic variables, including GDP growth, interest rates, international trade, and ASEAN-5 stock market performance, can elucidate the dynamics driving market responses in the ASEAN-5 region. In addition, the channels through which external economic shocks influence regional markets can be thoroughly comprehended, which can assist in formulating pertinent strategies to mitigate adverse impacts, while leveraging positive trends to contribute to the stability and growth of the ASEAN-5 economies. The deeper understanding will also aid in developing robust strategies to anticipate market movements and mitigate risks associated with global financial fluctuations.

LITERATURE REVIEW

Asset pricing models have continuously been instrumental in comprehending stock market behaviours and providing essential insights into the relationship between macroeconomic variables and stock returns. The two most prominent models are the capital asset pricing model (CAPM) and the arbitrage pricing theory (APT). The CAPM, which was introduced by Sharpe (1964) and Lintner (1965), posits that the expected return of an asset is directly correlated to systemic risks measured by the beta to the market portfolio. The APT, which was developed by Ross (1976), is more flexible and allows for multiple sources of systematic risks and factors, including inflation, interest rates, and exchange rates, with relevant impacts on asset returns. Both models have provided the theoretical foundation for empirical research investigating the impact of macroeconomic variables on stock market performance and have been extensively applied to explore how stock markets respond to changes in macroeconomic variables. Accordingly, numerous studies demonstrated varying relationships between stock returns and factors, such as interest rates, inflation, exchange rates, and GDP growth. Atilgan et al. (2019) analysed the association between systematic risk and stock returns in 26 developed markets and indicated a weak and negative relationship between downside risks and returns at the portfolio level, which posited that investors might pay a higher premium for stocks with lower downside risks. Chhapra and Kashif (2019) also conducted a similar analysis on the data collected from the Pakistan Stock Exchange and uncovered that certain stocks with favourable risk characteristics, such as positive co-kurtosis and negative co-skewness, were preferred by investors and would be offered with higher premiums in the market. The insight has deepened our understanding of how investor preferences might vary in response to macroeconomic shifts.

Azam (2022) explored the effectiveness of the CAPM in explaining stock returns in the Philippine market and his findings corroborated the view that the CAPM remained a robust model for understanding stock returns, especially in emerging markets. In particular, the study revealed a significant relationship between the excess market returns and the excess returns of individual portfolios. Darma (2021) employed the APT to scrutinise the Indonesian LQ45 index and discovered

that macroeconomic factors, such as inflation and interest rates, produced strong influences on stock returns, although certain assumptions of the APT were not constantly sustained. The findings showed that the application of the APT in emerging markets might necessitate further adaptation to account for the unique characteristics of the markets despite the APT being an instrumental framework. In addition, Nyanga and Qutieshat (2022) revealed the challenges in selecting appropriate macroeconomic variables to be included in the APT, and emphasised that the effectiveness of the APT was contingent on accurately identifying the key drivers of stock market performance, which could vary across different economic environments. In addition, Peixoto Messias and Carrasco-Gutierrez (2022) highlighted that factors, such as GDP growth and exchange rates, profoundly influenced stock returns in Brazil, which affirmed the flexibility and applicability of the APT in emerging markets. Meanwhile, a growing research body has focused on the correlation between macroeconomic factors in developed markets, especially the U.S. economy, and stock market performance in emerging economies, including the ASEAN-5 countries. The interconnectedness of global financial markets and fluctuations in the U.S. economy, especially U.S. interest rates, U.S. international trade, and other key economic variables, can profoundly influence ASEAN-5 stock markets.

Numerous studies examined the association between the U.S. economy and ASEAN-5 stock markets by frequently employing the U.S. stock market as a proxy for the U.S. economy. Chin and Paphakin (2021) demonstrated that the relationship between U.S. asset prices and international stock prices was consistent with U.S. economic fundamentals, which postulated the significant influence of the U.S. economy on global stock prices. Lee et al. (2022) also revealed that the U.S. stock market profoundly impacted ASEAN-5 stock markets during the coronavirus disease (COVID-19) pandemic, especially from January 2020 to January 2021. Similarly, Vo and Tran (2020) identified a strong spread of volatility from the U.S. stock market to ASEAN markets after assessing the data from August 2001 to December 2016, and this was supported by an EGARCH model analysis. Trihadmini and Falianty (2020) also explored contagion and spillover effects from developed markets to ASEAN-5 countries via the DDC-GARCH model and revealed significant contagion, except for the Dow Jones Index, which did not significantly influence the PSEI in the Philippines. Jamil et al. (2023) also appraised the correlation between the U.S., United Kingdom (U.K.), European, and ASEAN-5 markets, which uncovered that only the Philippines stock market was cointegrated with the markets before the COVID-19 pandemic. Nonetheless, virtually all ASEAN-5 stock markets moved in tandem with U.S. and European markets during the COVID-19 pandemic, except for Thailand, Conversely, Majid et al. (2008) discovered no long-term linkage between the U.S. and ASEAN markets as Indonesia and Thailand were relatively independent of the U.S., whereas Malaysia and the Philippines exhibited slight dependence.

The relationship between U.S. interest rates and ASEAN-5 stock markets has been continuously evaluated, with past studies indicating a significant negative correlation between U.S. monetary policy and global stock markets. Miranda-Agrippino and Rey (2020) underscored that U.S. monetary tightening reduced the value of risky assets globally. Kim and Nguyen (2009) also demonstrated a negative impact of U.S. Federal Reserve rates on 12 Asia-Pacific stock markets from 1999 to 2006, and Chiang (2023) discovered a similar result, which provided further support for the view that U.S. interest rate changes negatively influenced global markets. Kim (2003) also discovered a direct impact of U.S. interest rates on ASEAN stock markets, and Yang and Hamori (2013) confirmed a negative influence of U.S. interest rates on several ASEAN markets, including Singapore, Thailand, and Indonesia. Collectively, these previous scholars have demonstrated that higher U.S. interest rates would negatively influence ASEAN-5 stock prices, although the relationship remains underexplored and further analysis on updated data is required. Furthermore, the association between exchange rates and stock markets has frequently been a topic for analysis. Nguyen et al. (2020) uncovered a negative impact of exchange

rates on Vietnamese stock index returns through GARCH models, and Syahri and Robiyanto (2020) corroborated the findings after scrutinising the Indonesian Composite Stock Price Index (CSPI). Both studies underscored that exchange rate depreciation negatively impacted stock prices in their respective countries. Soon et al. (2024) also assessed the linkage between the FTSE Bursa Malaysia KLCI stock market returns and the Malaysian foreign exchange rate. The findings indicated a negative long-term relationship and the presence of a short-term dynamic relationship between the two variables. Moreover, Abdullah et al. (2023) deepened the understanding of currency-stock market dynamics by demonstrating that the CNY/USD exchange rate led both U.S. and Chinese stock index movements across different periods through VECM and MODWT analyses. The study outcomes postulated that currency fluctuations could profoundly influence stock market performance.

Saidi et al. (2021) revealed that the appreciation of the domestic exchange rate negatively impacted Indonesian stock prices in the short term, but discovered no significant long-term asymmetry. In contrast, Narayan et al. (2020) discovered that Japanese exchange rate depreciation during the COVID-19 pandemic improved stock market returns by an average of 71%. Meanwhile, Sheikh et al. (2020) argued that positive exchange rate shocks positively influenced Pakistani stock prices, whereas negative shocks produced no long-term impact. Reza et al. (2020) also examined the ASEAN-5 exchange rates and stock prices from 2010 to 2018 by employing bivariate vector autoregressive (BVAR) models and uncovered no direct relationship between exchange rates and stock prices. Similarly, Fransisca and Herijawati (2022) discovered that exchange rates insignificantly influenced Indonesian stock prices from 2017 to 2020. International trade, encompassing imports and exports, has also been investigated with stock market performance. Susanto et al. (2024) highlighted that international trade plays a crucial role in market share expansion and employment creation. Celebi and Honig (2019) demonstrated a significant negative influence of lagged exports on German stock returns from 1991 to 2018, while Kiani et al. (2023) reported a positive correlation between higher trade volumes and stock market performance in Pakistan from 2018 to 2022. You et al. (2024) assessed the impact of international trade networks on stock market spillovers across 11 countries between 2000 and 2021 and revealed that international trade profoundly influences stock market spillovers, especially when countries acted as importers. Nevertheless, the study discovered no clear aggregate connection between trade and stock-market connectedness. Auer et al. (2022) uncovered that higher trade intensity resulted in higher global stock market synchronisation, which posited a closer linkage between trade and stock market co-movements compared to previous scholars' findings.

Determining an appropriate econometric model is critical to uncovering reliable insights as the relationships between macroeconomic variables and stock market performance are complex and dynamic. A specific model that has gained increasing popularity in examining the association between economic variables and stock markets is the panel ARDL model, which allows researchers to estimate both the short- and long-term correlations between variables while addressing issues, such as mixed integration orders (I(0) and I(1)) and cross-sectional dependence (Pesaran et al., 1999). Traditional econometric models, such as DOLS or FMOLS, frequently presume that all variables are either stationary or non-stationary, whereas the panel ARDL model can manage variables of different orders of integration, which is highly advantageous for studies involving macroeconomic data (Pesaran et al., 1999; Onyeneke et al., 2023). Several previous studies also employed the panel ARDL model to evaluate the linkages between economic indicators and stock prices in the context of stock market performance and macroeconomic factors. For example, Heriqbaldi and Mufiidah (2023) utilised the panel ARDL model to explore the FDI determinants among ASEAN economies, while Bacay et al. (2022) applied the model to assess the correlation between public debt and economic growth among the ASEAN-5 markets. Cheah et al. (2021) also employed the model to scrutinise the relationship between

stock prices and exchange rates in ASEAN countries. Collectively, these studies demonstrated the ability of the model to effectively analyse both the short-term adjustments and long-term equilibrium, particularly when analysing the GDP, inflation, exchange rates, and stock market returns.

An advantage of the panel ARDL model is its capability to analyse data from multiple countries, which is crucial when examining the ASEAN-5 economies with their significant differences in economic conditions and institutional structures (Asteriou et al., 2021). The model is also suitable for examining the dynamic and potentially asymmetric relationships between the U.S. economy and ASEAN stock markets, as the model provides a comprehensive framework for modelling and investigating both short- and long-term associations. Pesaran et al. (1999) also introduced the pooled mean group (PMG) estimator, which is frequently utilised alongside the panel ARDL model. The PMG estimator allows for heterogeneity in the short-term coefficients across cross-sections (countries) while assuming that the long-term coefficients are identical across nations. The assumption is highly instrumental when appraising cross-border economic linkages, which enables country-specific short-term responses to economic shocks, while maintaining a common long-term relationship. Concurrently, the method is highly relevant when scrutinising the relationship between the U.S. GDP, interest rates, exchange rates, and ASEAN-5 stock market performance, which allows for cross-country variations in the short-term dynamics, while maintaining long-term stability in the model (Pesaran & Smith, 1995).

In sum, the current literature review has demonstrated an intricate linkage between macroeconomic factors and stock market performance, with key models, such as the CAPM and APT, providing valuable insights into how variables, such as interest rates, inflation, exchange rates, and GDP growth, would influence stock returns. Previous academicians consistently underscored the significant impact of U.S. economic conditions on ASEAN-5 stock markets in terms of interest rates and international trade. Nonetheless, the influences of the variables could vary depending on the specific market and economic context. Exchange rates and trade also play significant roles, although relevant effects are more context-dependent. The literature reviewed has underscored the importance of further research to thoroughly understand the dynamics, especially through advanced econometric models, such as the panel ARDL, which can offer more nuanced insights into the interconnectedness of global financial markets.

METHODOLOGY

The present study has analysed the influence of the U.S. GDP and monetary policy on the ASEAN-5 stock markets, bearing in mind the control variables, namely the domestic REER and U.S. international trade. In particular, panel data, which included semi-annual observations from 38 different periods, were employed for a thorough analysis of how the factors collectively influenced ASEAN-5 stock market performance. Table 1 presents the summary statistics from a total of 190 observations of the study variables based on the data collected from the five ASEAN countries. The mean score of *stock* was 0.02, with a standard deviation of 0.15, which indicated a certain variability in the value. The summary statistics of variables and correlation analysis are as illustrated in Table 2 and Table 3. They offer preliminary findings from a comprehensive analysis using the unit root test and homogeneity test, conducted to derive reliable and unbiased outcomes to determine the relationship between the variables.

Table 1

Summary Statistics of the Datasets

Variable	Description	Source
Stock	ASEAN-5 stock market performance (index)	Eikon Database
U.S. GDP	The U.S. GDP growth rate (%)	Federal Reserve Bank of St. Louis
U.S. FR	Change in the U.S. Federal Funds Rate (%)	Federal Reserve Bank of St. Louis
REER	Real Effective Exchange Rate (%)	Eikon Database
U.S. Trade	The U.S. international trade as a percentage of GDP (%)	Eikon Database

Table 2

Summary Statistics of Variables

Variable	Observation	Mean	Standard Deviation	Min	Max
Stock	190	.02	.15	- .51	.70
U.S. GDP	190	.16	1.78	- 4.53	5.65
U.S. FR	190	.08	1.37	- 4.25	5.25
REER	190	99.26	8.87	78.08	120.04
U.S. Trade	190	.88	.24	.60	1.44

Table 3

The Correlation Analysis of the Variables

Variable	Stock	U.S. GDP	U.S. FR	REER	U.S. Trade
Stock	1.00				
U.S. GDP	.02	1.00			
U.S. FR	.26	.23	1.00		
REER	- .02	.01	- .01	1.00	
U.S. Trade	.01	.28	- .01	- .23	1.00

The current study assessed the assumption of slope homogeneity via performing tests introduced by Pesaran and Yamagata (2008) and Blomquist and Westerlund (2013), which evaluated whether the slope coefficients across cross-sectional units were uniform and accounted for the potential presence of heteroscedasticity and autocorrelation by incorporating heteroscedasticity, and autocorrelation-consistent (HAC) standard errors. A rejection of the null hypothesis of slope homogeneity suggests the presence of heterogeneity in the slope parameters across countries, which underscores the need to apply estimation techniques to accommodate cross-sectional differences as slope coefficients would vary due to country-specific economic, demographic, or structural factors (Ayyash et al., 2025). Assessing cross-sectional dependence is also essential to prevent significant estimation bias (Yong et al., 2023). Widely accepted statistical tests were employed to evaluate the presence of cross-sectional dependence (CSD) in the panel data. The CSD is particularly relevant in empirical analyses as increasing globalisation, trade liberalisation, and economic integration frequently lead to interdependencies among countries or regions, which render cross-sectional units susceptible to common shocks. Detecting such dependence is vital not only for comprehending the underlying data structure, but also for guiding the selection of

appropriate unit root tests and improving the robustness of econometric estimations (Ayyash et al., 2025). The panel data could be classified as a small-N or large-T structure as the time dimension (T = 38) of the panel data was substantially larger than the cross-sectional dimension (N = 5) (Pesaran, 2004), which justified the usage of cross-sectional dependence tests for panels with a relatively longer period and fewer cross-sectional units. The tests operated under the null hypothesis of cross-sectional independence, and any rejection of the null hypothesis would indicate significant cross-sectional dependence within the panel. Identifying CSD could also assist in preventing stationarity bias and guaranteeing that subsequent model selection and estimation techniques could adequately account for inter-unit linkages (Ayyash et al., 2025). The panel ARDL model was employed to investigate both the short- and long-term linkages among the study variables.

The associations between variables were evaluated via the panel ARDL model as follows in Equation (1):

$$STOCK_{it} = \alpha_i + \sum_{j=1}^{p} \beta_0 STOCK_{i,t-j} + \sum_{j=0}^{q} \beta_1 US\_GDP_{i,t-j} + \sum_{i=0}^{q} \beta_2 US\_FR_{i,t-j} + \sum_{i=0}^{q} \beta_3 REER_{i,t-j} + \sum_{i=0}^{q} \beta_4 US\_TRADE_{i,t-j} + \varepsilon_{it} \quad (1)$$

Where *STOCKit* represents the stock market performance of ASEAN-5; *US_GDP* symbolises the GDP growth rate of the U.S.; *US_FR* emblematises the change in Federal Funds Rate of the U.S.; REER denotes the real effective exchange rate of ASEAN-5 countries; *US_TRADE* signifies the U.S. international trade as a percentage of GDP; i is the cross-sectional unit (each ASEAN-5 country); t represents the period; j refers to the lag order of the variables included in the model; p and q symbolise the optimal lag orders, and ε_{it} signifies the error term. The re-parametrised panel ARDL error correction model is specified as follows in Equation (2):

$$\Delta STOCK_{it} = \alpha_i + \Phi_i\left(STOCK_{i,t-j} - \theta_1 US\_GDP_{i,t-j} - \theta_2 US\_FR_{i,t-j} - \theta_3 REER_{i,t-j} - \theta_4 US\_TRADE_{i,t-j}\right) + \sum_{j=1}^{p-1} \lambda_{ij} \Delta STOCK_{i,t-j} + \sum_{j=0}^{q-1} \lambda'_{ij} \Delta US\_GDP_{i,t-j} + \sum_{i=0}^{q-1} \lambda''_{ij} \Delta US\_FR_{i,t-j} + \sum_{i=0}^{q-1} \lambda'''_{ij} \Delta REER_{i,t-j} + \sum_{i=0}^{q-1} \lambda''''_{ij} \Delta US\_TRADE_{i,t-j} + \varepsilon_{it} \quad (2)$$

Where Φ represents the group-specific speed of adjustment coefficient; θ_1, θ_2, θ_3, and θ_4 symbolise the long-run coefficients in the model, and λ, λ', λ", λ"' and λ"" emblematise the short-term coefficients of the lagged dependent variable and other control variables.

RESULTS

The study analysis commenced with appraising slope homogeneity across the panel via the tests developed by Pesaran and Yamagata (2008) and Blomquist and Westerlund (2013). Table 4 depicts that both tests reject the null hypothesis of slope homogeneity, which postulates the presence of heterogeneous slope coefficients among the ASEAN-5 countries and highlights the significance of adopting estimation techniques to accommodate cross-sectional heterogeneity in the subsequent modelling process. The Breusch-Pagan LM test was conducted following the fixed effects estimation to investigate the presence of CSD in the panel data. The test yielded a chi-squared value of 245.18, with a p-value below 0.001. Pesaran's test for CSD was also conducted to identify the residual correlation across panel units, which produced a statistic of 15.65 with a p-value below 0.001 and rejected the null hypothesis. Both tests produced statistically significant results at the 1% level and offered robust evidence of CSD among the study variables, which reflected the interconnected nature

of the ASEAN-5 economies and similar trade linkages, policy frameworks, and exposure to regional and global economic shocks.

Table 4

The Slope Homogeneity Test Results

Statictic	Value	p-value
Delta $(\hat{\Delta})$	- 2.476 **	.013
Delta adjusted $(\hat{\Delta}_{adj})$	- 2.759 ***	.006
Delta$_{HAC}$ (Δ_{HAC})	- 2.329 **	.020
Delta$_{HAC}$ adjusted $(\Delta_{HAC})_{adj}$	- 2.595 ***	.009

Notes. ** and *** denote the rejection of the slope homogeneity hypothesis at the 5% and 1% significance levels respectively.

This study employed second-generation panel unit root tests, namely the Cross-Sectionally Augmented Dickey-Fuller (CADF) and Cross-Sectionally Augmented IPS (CIPS) tests, to assess the stationarity properties of the variables owing to the significant presence of CSD. Early contributions by Quah (1990) demonstrated that the asymptotic properties of panel unit root tests relied on the assumption of identically and independently distributed disturbances and variation across units. Nonetheless, the models were limited owing to not being capable of accommodating aggregate common factors or country-specific effects. Breitung and Meyer (1991) also highlighted that the approach requires uniform serial correlation structures across individuals and does not extend to panels with heterogeneous or identical series, although the Dickey-Fuller statistic can exhibit asymptotic normality under specific conditions. As such, the present study utilised traditional time-series unit root tests, including the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests for variables without cross-sectional variations, such as U.S. GDP, U.S. FR, and U.S. international trade (Dickey & Fuller, 1979; Phillips & Perron, 1988). Meanwhile, panel-based unit root tests, including both CADF and CIPS, were utilised for variables exhibiting both cross-sectional and temporal variations, such as ASEAN-5 stock markets and the REER. The distinction ensured methodological alignment with both data structures and the most optimal econometric practices. The decision criterion was based on the p-value of the tests, wherein the variable was considered stationary and indicated no unit root if the absolute p-value was below the 5% significance level. In contrast, the variable was perceived as non-stationary and posited the presence of a unit root if the absolute p-value exceeded the 5% significance level.

Table 5 portrays that the variables, namely *stock*, *US_GDP*, and *US_FR*, are stationary at Level I(0) as the null hypothesis of a unit root was rejected by both tests. In contrast, variables, namely the *REER* and *US_TRADE*, were non-stationary at both levels but became stationary after first differencing, which suggested being part of Integration Order One or I(1). The presence of variables with mixed integration orders necessitated the adoption of the panel ARDL model as an alternative to traditional static or panel cointegration techniques (Asteriou & Monastiriotis, 2004), which was suitable for estimating both short-term dynamics and long-term relationships in heterogeneous panels with mixed integration orders. The present study also utilised the panel cointegration test developed by Westerlund (2007) to appraise the existence of a long-term relationship among the variables. The test evaluated both group-mean statistics (*Gt* and *Ga*) and panel-mean statistics (*Pt* and *Pa*) under the null hypothesis of no cointegration. Table 6 illustrates that all four test statistics produced p-values below 0.001, which therefore, rejected the null hypothesis at the 1% significance level. The findings confirmed the presence of cointegration among the variables across all model specifications and validated the application of the panel ARDL-ECM framework for further analysis.

Table 5

Unit Root Results

Variable	CIPS		CADF	
	Level	1st Difference	Level	1st Difference
stock	- 5.132 ***	- 6.190 ***	- 2.972 ***	- 5.580 ***
REER	- 2.180	- 4.177 ***	- 2.130	- 2.553 **
Variable	ADF		PP	
	Level	1st Difference	Level	1st Difference
us_gdp	- 3.130 **	- 4.694 ***	- 4.596 ***	- 9.723 ***
us_fr	- 3.594 ***	- 6.251 ***	- 6.978 ***	- 13.592 ***
us_trade	- 2.783 *	- 3.201 **	- 2.042	- 6.018 ***

Notes. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

Table 6

Westerlund Cointegration Test Results

Statistic	Value	p-value
Gt	- 3.739 ***	.000
Ga	- 24.170 ***	.000
Pt	- 8.373 ***	.000
Pa	- 24.300 ***	.000

Notes. *** indicates significance at the 1% level.

Identifying cointegration relationships among the variables through Westerlund's (2007) panel cointegration test provided empirical support for examining both short-term dynamics and long-term equilibria. The presence of cointegration validated the utilisation of the panel ARDL model, which incorporated the error correction mechanism to capture adjustments toward long-term equilibrium following short-term shocks. The mixed order of integration among the variables and the presence of CSD and slope heterogeneity also corroborated the usage of the panel ARDL model through the PMG estimator. The long-term estimation results obtained from the PMG estimator are reported in Table 7, in which both the U.S. GDP growth rate (*US_GDP*) and the change in U.S. Federal Funds Rate (*US_FR*) produced statistically significant long-term influences on stock market performance across the ASEAN-5 countries. Specifically, the U.S. GDP produced a negative coefficient (- 0.0241) significant at the 1% level, which postulated that an increase in U.S. economic growth was associated with a decline in long-term ASEAN-5 stock market performance. In contrast, the U.S. Federal Funds Rate demonstrated a significant and positive coefficient (0.0470) at the 1% significance level, which posited that an increase in the U.S. Federal Funds Rate was correlated to the long-term improvement in ASEAN-5 stock markets. This result is aligned with that in Hung et al. (2022), wherein the stock market of a nation would be influenced by the monetary policy of other countries.

Other variables, including the domestic REER (p = 0.2240) and U.S. international trade as a percentage of the GDP (*US_TRADE*) (p = 0.1690), did not produce statistically significant long-term effects, which showed that exchange rate movements and U.S. international trade might not exert a constant influence on ASEAN-5 stock markets. This result corresponded to that in Khan et al. (2025), who examined the impact of exchange rate volatility on stock return dynamics in Pakistan. Moreover, the finding on the

long-term impact of international trade was consistent with that in Liu et al. (2025), wherein markets tended to adjust through expectation realignment, corporate adaptation, and domestic policy responses, which would result in an insignificant increase in financial market risk in the Chinese market. Table 8 depicts the short-term dynamics of the model, in which the coefficient of the error correction term (ECT) is - 1.0084 and statistically significant at the 1% level and affirms the presence of a stable long-term equilibrium among the variables. The ECT magnitude also postulated rapid convergence to the equilibrium following short-term deviations and highlighted strong mean-reverting tendencies among ASEAN-5 stock markets. The results also demonstrated that all included variables significantly impacted stock prices in the short term, despite the varying levels of direction. In particular, the *US_GDP* produced a profound and positive short-term influence, which underscored that U.S. economic growth was associated with rising ASEAN-5 stock prices in the short term. The REER also produced a statistically significant positive impact in the short term, which suggested that currency appreciation might temporarily boost investor confidence or improve the valuation of foreign-denominated assets.

The *US_FR* negatively influenced short-term ASEAN-5 stock performance, which posited that higher U.S. interest rates might precipitate capital flight or diminish investment incentives in emerging markets. Nevertheless, the negative impact did not persist in the long term, which corresponded to the finding in Khan et al. (2025), who identified a significant short-term positive indirect influence of exchange rate volatility on stock returns transmitted through Pakistani stock market volatility. The variable, namely U.S. international trade, was demonstrated to exert a negative and significant short-term impact on ASEAN-5 stock markets, which indicated that short-term increases in U.S. trade activities might divert global capital away from ASEAN markets and reflect trade competition pressures, with adverse impacts on regional stock prices. The findings aligned with that in Liu et al. (2025), who discovered that international trade policy uncertainties profoundly elevated market volatility and financial risks in the short term. Liu et al. (2025) focused on the Chinese financial market and uncovered how firms exposed to external trade policy risks would experience heightened short-term market instability. In sum, the presence of a significant ECT alongside varying short- and long-term coefficients supported the utilisation of the panel ARDL model with an ECM. The framework could effectively capture the nuanced dynamics between global macroeconomic factors and regional stock market behaviours by distinguishing between short-term fluctuations and long-term trends.

Table 7

Long-Term Estimation Results

Variable	Coefficient	p-value
us_gdp	- .0241 ***	.0040
us_fr	.0470 ***	.0000
reer	- .0018	.2240
us_trade	.0696	.1690

Notes. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

Table 8

Short-Term Estimation Results

Variable	Coefficient	p-value
ECT	- 1.0084	.0000
us_gdp	0.0315 ***	.0000
us_fr	- .0099 ***	.0100
reer	0.0062 **	.0340
us_trade	- 0.2974 ***	.0000
C	0.1849	.0000

Notes. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively.

The current study has employed the fully modified ordinary least squares (FMOLS) technique as a robustness check to verify the reliability of the long-term relationships identified in the panel ARDL-PMG estimation. The FMOLS technique, which was developed by Phillips and Hansen (1990) and further extended for panel settings by Pedroni (2000), serves to address the issues of endogeneity and serial correlation in cointegrated panel data models. The FMOLS method assumes that all variables are within the same order of integration and provides consistent estimates of the long-term parameters. The method is highly effective in small samples and allows for heterogeneity across cross-sectional units (Khurshid et al., 2024). Table 9 demonstrates that the FMOLS estimates corroborated the expected signs for the key explanatory variables. Specifically, the *US_FR* and the *US_TRADE* produced positive and statistically significant long-term impacts on the dependent variable, whereas the *US_GDP* exerted a negative and profound influence. Meanwhile, the REER was statistically insignificant in the FMOLS model despite producing a negative effect. The findings were broadly consistent with the PMG estimates in terms of sign and magnitude, which validated the robustness of the long-term relationships identified in the primary model. The consistency in the direction of the coefficients across both estimation techniques strengthened the validity of the findings.

Table 9

Robustness Check

Variable	Coefficient	t-statistic	p-value
us_gdp	- .0143	- 2.6688	.0083
us_fr	.0252	3.7771	.0002
reer	- .0004	- 0.3334	.7392
us_trade	.1323	3.1343	.0020

CONCLUSION

The present study has appraised the impacts of U.S. economic indicators on the stock market performance of the ASEAN-5 countries, which comprised Malaysia, Singapore, Thailand, the Philippines, and Indonesia. The results contributed several significant insights into the relationship between the U.S. economy and the ASEAN-5 stock markets, in which a thorough understanding of how external economic conditions, especially from the U.S. market, would impact ASEAN-5 stock market performance is of great significance to investors, policymakers, and financial analysts amidst the

increasing globalisation of financial markets. In particular, this study provided a more comprehensive comprehension of the interconnectedness between the U.S. economy and the ASEAN-5 nations, and highlighted the critical role of global economic conditions in shaping local market dynamics. The long-term results also uncovered that the U.S. GDP growth rate negatively impacted ASEAN-5 stock markets, which suggested that higher U.S. economic growth corresponded with declining regional stock returns over extended periods. In contrast, the change in the U.S. Federal Funds Rate produced a positive and significant long-term impact, which posited that rising U.S. Federal Funds Rate might attract higher capital flows or signal improved global economic conditions favourable to ASEAN-5 equity markets. The findings appear to differ from earlier assumptions that U.S. economic expansions would uniformly boost emerging markets, which underscored the complex transmission channels influencing the impacts. Notably, the REER and U.S. international trade did not exhibit statistically significant long-term impacts on ASEAN-5 stock prices, contrary to what had previously been assumed that currency fluctuations and trade volumes did not continuously shape regional equity market performance, potentially due to adaptive expectations and regional policy responses that mitigated long-term exchange rates and trade shocks.

The U.S. GDP growth rate in the short term positively influenced ASEAN-5 stock returns, which reflected immediate investor optimism associated with U.S. economic expansion. Conversely, the change in U.S. Federal Funds Rate negatively influenced regional markets, which highlighted sensitivity to tighter U.S. monetary policy that might trigger capital outflows or increased borrowing costs. The REER also produced a positive short-term impact, which postulated that currency appreciations could temporarily enhance investor confidence. Furthermore, the U.S. international trade negatively influenced ASEAN-5 stock market performance in the short term, possibly owing to trade competition or capital reallocation effects. The significant ECT ascertained a stable long-term equilibrium among the variables, with rapid adjustment following short-term disturbances, which emphasised the importance of accounting for both dynamic and persistent impacts in policy formulation. As such, the results affirmed the growing financial interdependence between ASEAN-5 and global markets, especially the U.S., and underscored the significance of regional mechanisms to buffer external shocks, such as the Chiang Mai Initiative Multilateralisation (CMIM) playing a crucial role as a regional liquidity support framework. Strengthening and operationalising regional mechanisms by incorporating more responsive and flexible disbursement protocols is vital to guaranteeing that ASEAN-5 countries can withstand and effectively address heightened market volatility without compromising domestic economic goals. In addition, the findings supported ongoing efforts towards higher financial integration within the ASEAN-5 region. Initiatives under the ASEAN Economic Community (AEC) have offered an essential platform to harmonise financial regulations, improve capital market connectivity, and support cross-border investment. Deeper regional integration not only decreases the dependence on external economic cycles, but also widens access to funding and increases risk-sharing among member countries. Hence, relevant structural improvements are increasingly critical in a market landscape shaped by rapid technological transformations, geopolitical shifts, and climate-related uncertainties.

While the U.S. international trade did not significantly shape long-term stock market outcomes, the exposure of the ASEAN region to global trade dynamics remained high. Strengthening intra-ASEAN trade relationships and leveraging broader frameworks, such as the Regional Comprehensive Economic Partnership (RCEP), can aid in facilitating supply chain resilience and reducing the risks associated with overdependence on any single external market. As a result, market sentiment can be stabilised and long-term investment prospects can be elevated. The current findings also underscored the requirement for agile macroeconomic management, in which ASEAN-5 policymakers should maintain vigilance in monitoring global economic signals, particularly regarding shifts in U.S. monetary policies and

economic cycles. Furthermore, enhanced cooperation among central banks, higher financial data transparency, and the development of early warning systems can assist in mitigating adverse spillovers. Notably, capital market development, especially in digital finance, green bonds, and infrastructure investment, should be prioritised to attract long-term and stable investment flows.

In sum, this study has highlighted various impacts of the U.S. economic factors on the ASEAN-5 stock market performance, which indicated both the opportunities and vulnerabilities inherent in regional financial openness. Different ASEAN-5 economies should continue to develop institutional resilience, diversify trade and investment relationships, and deepen regional economic cooperation to ensure stability and long-term growth. The strategies are not only defensive but also offer a proactive path towards economic modernisation and strategic autonomy in an increasingly convoluted global environment. Future researchers can expand the present study's scope by integrating geopolitical developments, ESG investment flows, digital assets, and sector-specific shocks, which can further illuminate effective pathways for ASEAN-5 markets to achieve sustainable development and financial stability in an uncertain financial landscape.

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