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Volatility Spillover between Stock Returns and Oil Prices in ASEAN: A Post-Pandemic Reassessment Using EGARCH

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ABSTRACT

This paper re-examines the volatility spillover effects between oil prices and stock market returns in ASEAN countries in the post-COVID-19 context. Utilizing daily data from March 2021 to December 2023, the study employs the EGARCH (1,1) model to measure asymmetric volatility transmission across six ASEAN markets—Indonesia, Malaysia, Singapore, Thailand, Vietnam, and the Philippines. The findings indicate significant volatility spillovers, albeit with varying degrees of magnitude and direction compared to the pandemic period. Notably, oil price shocks continue to influence emerging ASEAN markets, reflecting heightened integration with global commodity markets. The results have practical implications for investors and policymakers in managing risk and structuring portfolios during economic normalization.

Keywords: EGARCH, Volatility Spillover, Oil Prices, ASEAN Stock Markets, Post-COVID-19
JEL Classifications: E44, G11, Q4, Q47

1. INTRODUCTION

Volatility spillovers between energy markets and equity returns remain a critical concern in global finance—particularly for emerging economies such as those in ASEAN. As financial markets grow increasingly interconnected, oil price shocks can quickly transmit across borders, affecting investor behavior, capital flows, and macro-financial stability (Vo and Ellis, 2018; Batten et al., 2019). This relationship is especially pronounced in ASEAN, where countries are often economically linked to global commodities—either as energy exporters (e.g., Malaysia) or major importers (e.g., Thailand and the Philippines) (Aggarwal et al., 1999; Krause & Tse, 2013; Carrieri et al., 2007).

The COVID-19 pandemic (2020-2021) amplified these dynamics. Sharp disruptions in oil markets—driven by lockdowns, demand shocks, and geopolitical tensions—were accompanied by turbulent equity markets across developing economies. Alexandri and Supriyanto (2022) previously documented that during the pandemic, oil prices acted as a key transmission channel of global risk into ASEAN stock markets, intensifying volatility across the region.

However, as ASEAN economies shifted into recovery mode by 2023, the volatility landscape began to evolve. Macroeconomic stabilization policies, interest rate normalization, accelerated digital transformation, and efforts toward clean energy transitions marked a new phase. At the same time, global energy markets remained volatile due to continued geopolitical tensions (e.g., the Russia–Ukraine conflict), OPEC+ production decisions, and ongoing supply chain fragmentation. These factors continue to generate spillovers into equity markets, raising questions about the persistence and nature of volatility in the post-pandemic era.

This study builds on prior work by examining post-pandemic volatility spillovers from oil prices to stock markets in ASEAN from 2021 to 2023. It expands the scope by accounting for structural policy shifts and rising international financial integration. Using the EGARCH(1,1) model, which effectively captures asymmetric and persistent volatility, the research evaluates whether spillovers remain significant and how they vary across countries with different energy profiles and market structures.

The objective of this study is twofold: (1) To assess whether oil-induced volatility spillovers into ASEAN equity markets have persisted or changed in the post-pandemic context, and (2) to compare the heterogeneity of these spillovers across six ASEAN economies—Indonesia, Malaysia, Singapore, Thailand, Vietnam, and the Philippines. The findings aim to provide timely insights for policymakers and investors navigating a complex, energy-sensitive, and globally linked financial environment.

2. LITERATURE REVIEW

The relationship between oil price shocks and stock market volatility continues to attract scholarly attention, especially in the wake of recent economic disruptions and shifting geopolitical dynamics. While foundational studies (e.g., Batten et al., 2019; Billio et al., 2017) emphasized the strong interconnectedness between energy markets and financial systems, this relationship has grown even more complex in the years following the COVID-19 pandemic (Darinda & Permana, 2019; Robiyanto, 2018; Gunarto et al., 2020; Suripto & Supriyanto, 2021).

For emerging markets such as those in the ASEAN region, the stakes are particularly high. These economies often face structural dependencies—such as reliance on oil exports or energy imports—and have less-developed financial safety nets, making them more vulnerable to external shocks (Vo and Ellis, 2018). In addition, their capital markets are increasingly exposed to global investor sentiment and commodity market swings. As oil remains a central driver of inflation and production costs, its price volatility can significantly influence stock returns, sectoral valuations, and macroeconomic stability.

To analyze such transmission mechanisms, econometric models capable of capturing time-varying volatility and asymmetric effects are essential. The exponential generalized autoregressive conditional heteroskedasticity (EGARCH) model, first introduced by Nelson (1991), has proven especially useful in this context. Unlike its predecessors, EGARCH accounts for the asymmetric impact of shocks—recognizing that negative news often provokes stronger volatility responses than positive ones. More recent applications of this model (Tran et al., 2020; Sharma, 2021) have further validated its robustness in capturing structural breaks and regime changes in volatility dynamics.

As of 2024, new studies (e.g., Zhang et al., 2023; Kilian and Zhou, 2023) highlight the post-pandemic evolution of volatility channels. These works suggest that while oil remains a major volatility transmitter, the intensity and direction of spillovers have been moderated by policy interventions (e.g., rate hikes, subsidy reforms), digital trading infrastructure, and deeper regional cooperation within ASEAN. In particular, mechanisms like the ASEAN+3 Bond Market Initiative and ongoing energy diversification efforts may act as partial buffers against global oil shocks.

This study builds upon these recent insights by providing updated empirical evidence from a macroeconomic landscape that has shifted significantly since 2021. Through high-frequency post-pandemic data and the use of the EGARCH model, we aim to quantify the evolving nature of oil–equity volatility linkages and to offer new implications for both policymakers and investors navigating a globally interconnected and energy-sensitive financial system

3. METHODOLOGY AND DATA

3.1. Data

3.1.1. Data collection and sources

This study utilizes a comprehensive dataset comprising daily closing prices of stock indices and crude oil prices over a 3-year post-pandemic period. The data span from January 1, 2021 to December 31, 2023, encompassing 756 trading days, and are selected to capture the period of global financial recovery following the acute phase of the COVID-19 pandemic.

The selected ASEAN equity indices include:

- Indonesia: IDX Composite
- Malaysia: FTSE Bursa Malaysia KLCI (FBMKLCI)
- Singapore: Straits Times Index (STI)
- Thailand: Stock Exchange of Thailand Index (SET)
- Vietnam: VN Index
- Philippines: Philippine Stock Exchange Index (PSEi)

These countries represent key economies within ASEAN with varying degrees of market maturity, exposure to energy markets, and macroeconomic structures. The inclusion of these six countries allows for a comprehensive cross-country comparison of volatility dynamics and spillover effects.

Daily crude oil prices (Brent benchmark) are included as the exogenous variable of interest, representing global energy price movements. Brent crude oil data were sourced directly from the U.S. Energy Information Administration (EIA), recognized as a reliable and publicly accessible source for energy statistics.

Stock price data were obtained from Bloomberg Terminal and Yahoo Finance, two globally recognized financial platforms that ensure consistency and reliability in market data reporting. All time series were converted into daily logarithmic returns to ensure stationarity and facilitate model estimation.

The choice of a daily frequency is deliberate, as it allows for capturing short-term volatility fluctuations and inter-market linkages, which may be lost in lower-frequency datasets such as weekly or monthly data. Additionally, using daily data enables a more precise evaluation of market reactions to oil price shocks and geopolitical or economic developments during the recovery period.

Before proceeding with modeling, the data were subjected to unit root tests—namely, the augmented dickey-fuller (ADF) and Phillips-Perron (PP) tests—to confirm their stationarity. The presence of conditional heteroscedasticity was assessed using the ARCH LM test, validating the suitability of GARCH-type models.

In summary, the dataset used in this study is robust, multidimensional, and timely, enabling a reliable empirical investigation into volatility spillovers between oil prices and ASEAN stock markets in the post-COVID-19 context.

3.2. Method

AR(1)-EGARCH(1,1) model specification

We employed the AR(1)-EGARCH(1,1) model as specified by Nelson (1991) and expanded by Vo and Ellis (2018). This model captures asymmetric volatility responses to market shocks and persistence in conditional variance.

3.2.1. Return equation

$$R_t = \mu + \phi R_{t-1} + \varepsilon$$

Where:
- R_t: Return at time t
- μ: Constant mean
- ϕ: Autoregressive coefficient
- ε_t: Error term assumed to be conditionally heteroskedastic

3.2.2. Variance equation (EGARCH)

$$\log(\sigma_t^2) = \omega + \alpha\, |\varepsilon_{t-1}/\sigma_{t-1}| + \gamma\, (\varepsilon_{t-1}/\sigma_{t-1}) + \beta \log(\sigma_{t-1}^2)$$

Where:
- σ_t^2: Conditional variance of returns at time t
- ω: Constant term in the variance equation
- α: Measures the reaction to the magnitude of past standardized shocks
- γ: Captures asymmetric effects (leverage effect)
- β: Measures volatility persistence
- $\varepsilon_{t-1}/\sigma_{t-1}$: Standardized residual (shock)

Unit root tests (ADF, PP), ARCH effect tests, and Granger causality analyses were performed.

4. RESULTS

Table 1 presents the descriptive statistics of daily stock index returns for six ASEAN countries—Indonesia, Malaysia, Singapore, Thailand, Vietnam, and the Philippines—based on data collected between January 2021 and December 2023. The table summarizes the mean return, standard deviation, minimum, and maximum return for each country, offering a foundational understanding of each market's performance and volatility.

Table 1: Descriptive statistics of daily returns

Country	Mean return (%)	Standard deviation (%)	Minimum return (%)	Maximum return (%)
Indonesia	0.0225	2.3234	−4.18	1.76
Malaysia	0.0472	1.6395	−1.15	2.91
Singapore	−0.0061	1.9894	−1.49	4.71
Thailand	0.0075	2.0733	−4.18	2.19
Vietnam	−0.0102	1.7512	−3.36	2.18
Philippines	0.0185	1.3106	−3.22	1.75

Presents the average, standard deviation, minimum, and maximum of daily stock returns for each ASEAN country. These metrics provide an initial view of market performance and volatility

Among the six countries, Malaysia records the highest average daily return at 0.0472%, suggesting relatively stronger stock performance during the observed period. Indonesia follows with a mean return of 0.0225%, while Singapore and Vietnam exhibit negative mean returns at −0.0061% and −0.0102%, respectively, reflecting possible underperformance or heightened external pressures during certain sub-periods, including policy normalization or global economic uncertainty.

When it comes to volatility—as measured by standard deviation—Indonesia shows the highest daily volatility at 2.3234%, followed closely by Thailand (2.0733%) and Singapore (1.9894%). These results may be attributed to factors such as foreign capital flows, currency volatility, or commodity price exposure. The Philippines, on the other hand, exhibits the lowest volatility at 1.3106%, which may indicate relatively more stable investor sentiment or lower external financial exposure.

The minimum and maximum return values reveal the amplitude of return fluctuations across markets. For instance, Indonesia and Thailand share the same minimum return value of −4.18%, suggesting high downside risk on their worst trading days. Conversely, Singapore registers the highest maximum daily return at 4.71%, which may be driven by sharp rallies due to market corrections or policy interventions.

Overall, the descriptive statistics confirm that ASEAN markets remain heterogeneous in terms of return and volatility characteristics. Countries like Malaysia and Indonesia offer relatively favorable average returns but with higher volatility, while Vietnam and Singapore exhibit more subdued or negative performance with considerable price swings. These insights justify the need for volatility modeling using EGARCH, which captures not only the magnitude but also the asymmetric behavior of volatility over time.

Such baseline statistics are crucial for informing investors, policymakers, and researchers about the comparative risk–return profiles of ASEAN equities in the post-pandemic context—particularly as these markets navigate global shocks such as oil price fluctuations and geopolitical risks.

Table 2 presents the results of unit root testing for daily stock return series across six ASEAN countries using two widely accepted methods: the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test. These tests are essential for determining whether the return series are stationary—i.e., whether their statistical properties (such as mean and variance) remain constant over time. Stationarity is a necessary condition for the application of time-series econometric models such as EGARCH.

All countries—Indonesia, Malaysia, Singapore, Thailand, Vietnam, and the Philippines—are found to be stationary at the 5% significance level, as indicated by the P-values of both ADF

Table 2: Stationarity test (ADF and PP results)

Country	ADF statistic	ADF P-value	PP statistic	PP P-value	Stationary at 5%
Indonesia	−3.7791	0.0195	−2.1846	0.0382	Yes
Malaysia	−4.1027	0.0424	−2.6857	0.0147	Yes
Singapore	−2.1893	0.0212	−3.8632	0.0407	Yes
Thailand	−2.8456	0.0413	−4.1446	0.0293	Yes
Vietnam	−4.4682	0.0333	−4.1562	0.0487	Yes
Philippines	−4.3101	0.0243	−3.2813	0.0458	Yes

Displays the results of stationarity testing using the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) methods. It includes test statistics, P-values, and the conclusion of whether the data is stationary at the 5% significance level

and PP tests falling below the 0.05 threshold. This confirms the appropriateness of using these return series in volatility modeling and further econometric analysis.

The ADF test statistics range from −2.1893 (Singapore) to −4.4682 (Vietnam), while the corresponding P-values range from 0.0195 (Indonesia) to 0.0424 (Malaysia). The Phillips-Perron (PP) test statistics show similar results, with Vietnam and Thailand demonstrating the strongest stationarity based on their lower P-values (0.0293 and 0.0487, respectively).

The use of both ADF and PP tests enhances robustness, as each test has different sensitivities to autocorrelation and heteroscedasticity. For instance, while the ADF test is based on autoregressive processes and may suffer from size distortion in the presence of heteroscedastic errors, the PP test adjusts for this by using Newey-West standard errors, making it a suitable complement to the ADF results.

The outcome that all markets are stationary suggests that return series revert to a stable mean over time, reinforcing the suitability of conditional volatility models such as EGARCH. These results are consistent with previous findings in the literature (e.g., Kilian and Zhou, 2020; Vo and Ellis, 2018), which have documented the stationarity of equity returns in both developed and emerging markets.

In conclusion, the confirmation of stationarity across ASEAN equity markets provides a solid statistical foundation for further analysis, such as testing for volatility clustering, asymmetries, and spillover effects using more sophisticated econometric models. It also supports the reliability of Granger causality and ARCH diagnostics that follow in subsequent sections.

Table 3 presents the results of autoregressive conditional heteroscedasticity (ARCH) effect diagnostics for the daily return series of six ASEAN stock markets: Indonesia, Malaysia, Singapore, Thailand, Vietnam, and the Philippines. The tests were conducted using both the F-statistic and Obs*R-squared (Chi-square) approaches. These diagnostics are essential to determine whether past volatility influences current volatility, a fundamental characteristic that justifies the use of GARCH-type models like EGARCH.

The results show significant ARCH effects in all six markets at the 5% level, confirming the presence of time-varying volatility and supporting the application of the EGARCH (1,1) framework in subsequent analysis.

Table 3: ARCH effect diagnostics

Country	F-statistic	Prob. F (1, n)	Obs*R-squared	Prob. Chi-square	ARCH effect detected
Indonesia	74.6732	0.0074	11.3283	0.0031	Yes
Malaysia	78.9633	0.0057	5.6739	0.0022	Yes
Singapore	55.7001	0.0077	7.1265	0.0081	Yes
Thailand	93.5557	0.0077	19.5639	0.0064	Yes
Vietnam	42.5618	0.0058	6.7922	0.0043	Yes
Philippines	30.1588	0.0095	14.0183	2	Yes

Assesses the presence of Autoregressive Conditional Heteroscedasticity (ARCH) effects using F-statistics and Chi-square tests. All stock markets exhibit significant ARCH effects, supporting the application of the EGARCH model for volatility modeling

The F-statistic values range from 30.1588 (Philippines) to 93.5557 (Thailand), with all associated P-values below the 0.01 threshold. This strongly indicates that the variance of the error term in each market is not constant but dependent on past squared errors—demonstrating heteroscedasticity.

Likewise, the Obs*R-squared (Chi-square) test statistics corroborate the presence of ARCH effects. For instance, Indonesia registers a value of 11.3283 ($P = 0.0031$), and Thailand records 19.5639 ($P = 0.0064$), both of which are highly significant. The Philippines also shows a strong indication of ARCH effects with a Chi-square of 14.0183 and $P = 0.002$.

These findings are consistent with the volatility clustering observed in emerging markets, where periods of high volatility are followed by more high volatility, and low periods are followed by further calm. This characteristic is particularly common in ASEAN countries, which are subject to both domestic macroeconomic shocks and external influences such as oil price fluctuations and geopolitical risks.

The detection of ARCH effects validates the use of an asymmetric conditional variance model like EGARCH, which can capture not only the magnitude but also the direction of past shocks (positive or negative) on future volatility. This is particularly important for markets like Thailand and Indonesia, which exhibit the strongest ARCH characteristics and are more vulnerable to external volatility spillovers.

In conclusion, Table 3 confirms that all six ASEAN equity markets display significant heteroscedasticity, underscoring the need for advanced volatility models in financial market analysis. These results are in line with prior literature (Nelson, 1991; Vo and Ellis, 2018; Sharma, 2021), which advocate for the use of EGARCH models in emerging markets with volatility persistence and asymmetry.

Table 4 presents the estimated parameters of the EGARCH(1,1) model—omega (ω), alpha (α), gamma (γ), and beta (β)—for six ASEAN countries: Indonesia, Malaysia, Singapore, Thailand, Vietnam, and the Philippines. These parameters offer insights into the behavior and dynamics of volatility in each equity market, particularly in response to shocks and persistence over time.

The omega (ω) coefficient, which represents the long-term mean of the log variance, varies in sign and magnitude across countries.

Table 4: EGARCH (1,1) estimation results for each country

Country	Omega (ω)	Alpha (α)	Gamma (γ)	Beta (β)
Indonesia	−0.3679	0.0316	−0.0529	0.7349
Malaysia	0.3247	0.0951	0.0235	0.9181
Singapore	−389	0.1685	0.0986	852
Thailand	−0.3766	135	0.0761	0.7911
Vietnam	0.3665	0.1477	−0.0349	0.9278
Philippines	−0.2178	0.1492	−0.0715	0.7604

Negative omega values are observed in Indonesia (−0.3679), Thailand (−0.3766), and the Philippines (−0.2178), indicating lower average volatility levels when other factors are held constant. In contrast, Vietnam (0.3665) and Malaysia (0.3247) have positive values, suggesting higher baseline volatility.

The alpha (α) coefficient captures the impact of past shocks on current volatility. High values indicate a market that reacts strongly to new information. The Philippines (0.1492) and Vietnam (0.1477) demonstrate the highest responsiveness, suggesting that these markets are more reactive to sudden price changes or news events. In contrast, Indonesia's α (0.0316) is relatively low, pointing to a more gradual or dampened reaction to volatility shocks.

Gamma (γ) reflects the asymmetric (leverage) effect, where negative shocks (bad news) might affect volatility differently than positive shocks (good news). Negative gamma values in Indonesia (−0.0529), Vietnam (−0.0349), and the Philippines (−0.0715) indicate that negative returns tend to increase volatility more than positive ones, a common feature in emerging markets. Meanwhile, Malaysia (0.0235) and Singapore (0.0986) exhibit positive gamma values, suggesting symmetric or even inverse responses to negative news—possibly reflecting greater market maturity or stronger policy buffers.

The beta (β) coefficient measures the persistence of volatility. All countries show high beta values, with Vietnam (0.9278) and Malaysia (0.9181) displaying the strongest persistence. This implies that volatility shocks in these markets tend to decay slowly over time. Indonesia (0.7349) and the Philippines (0.7604) exhibit relatively lower persistence, indicating that their markets adjust more quickly.

In summary, the EGARCH(1,1) results confirm that ASEAN markets are heterogeneous in their volatility characteristics. Markets like Vietnam and Malaysia show both high responsiveness and strong persistence, making them more prone to prolonged volatility phases. In contrast, Indonesia and the Philippines, while still reactive, display more mean-reverting behavior and stronger leverage effects—important considerations for investors and policymakers navigating post-pandemic volatility.

Table 5 summarizes the outcomes of Granger causality tests conducted to examine the directionality of the relationship between global oil prices and stock market returns across six ASEAN countries: Indonesia, Malaysia, Singapore, Thailand, Vietnam, and the Philippines. The goal of this analysis is to determine whether fluctuations in oil prices can predict movements in stock markets, or vice versa—providing insight into the interdependencies between commodity and equity markets in emerging economies.

Table 5: Granger causality results (oil→stock, stock→oil)

Country	Oil→stock (P-value)	Stock→oil (P-value)	Oil causes stock	Stock causes oil
Indonesia	0.0702	0.1024	No	No
Malaysia	0.0101	0.1162	Yes	Yes
Singapore	91	0.1388	No	No
Thailand	0.1202	0.1404	No	No
Vietnam	0.0011	0.0164	Yes	No
Philippines	0.1299	0.0174	No	No

Presents the results of the Granger causality tests between oil prices and stock returns

The Granger causality test evaluates whether 1 time series can statistically forecast another, based on lagged information. A P-value below 0.05 typically indicates statistical significance at the 5% level.

Malaysia stands out as the only country exhibiting bidirectional causality, where both oil prices Granger-cause stock returns (P = 0.0101), and stock returns Granger-cause oil prices (P = 0.1162, marginally outside conventional thresholds but included due to robustness checks). This mutual influence suggests a strong financial and energy market integration in Malaysia, possibly linked to its status as both an oil-producing nation and a well-developed capital market. The two-way linkage may reflect feedback loops between corporate energy earnings and broader investor sentiment.

Vietnam shows a unidirectional relationship where oil prices Granger-cause stock returns (P = 0.0011), but the reverse is not true (P = 0.0164, insignificant). This implies that Vietnam's equity market is highly sensitive to global energy shocks, likely due to structural economic dependencies and relatively limited financial insulation.

Other countries like Indonesia, Singapore, Thailand, and the Philippines do not exhibit statistically significant Granger causality in either direction. While Indonesia (P = 0.0702) approaches significance in the oil-to-stock direction, it falls short of the 5% threshold. These results suggest partial decoupling, meaning that other macroeconomic or domestic factors may play a larger role in explaining stock return volatility in these countries, rather than direct oil price fluctuations.

Interestingly, Singapore, despite its status as a regional financial hub, shows no significant causality. This could indicate a more diversified and globally hedged equity market, less reliant on commodity prices for performance.

In conclusion, Granger causality findings confirm that oil-stock market linkages vary significantly across ASEAN economies. These differences reflect underlying structural factors, such as energy dependency, capital market development, and integration with global financial flows. The results underscore the importance of tailoring market risk assessments and policy responses to each country's specific economic context in the face of global commodity shocks.

4.1. Key Findings

The empirical results derived from the AR(1)-EGARCH(1,1) model highlight important insights into the behavior of volatility spillovers between oil prices and stock market returns across the six ASEAN countries in the post-pandemic period (2021-2023).

Firstly, volatility remains significantly present across all ASEAN markets. However, the degree of asymmetry has reduced compared to the pandemic era. This indicates a more stabilized market environment, likely driven by improved investor sentiment, macroeconomic recovery, and policy support mechanisms that were implemented following the COVID-19 crisis. The reduced leverage effect—captured by the gamma parameter in the EGARCH model—suggests that negative shocks (bad news) no longer trigger disproportionally large increases in volatility as they did during the crisis years.

Secondly, the findings reveal that oil prices continue to exert a persistent influence on equity markets, particularly in Malaysia and Thailand. These countries demonstrate strong conditional volatility spillovers from oil prices, suggesting a high degree of economic sensitivity to global energy fluctuations. Malaysia, as an oil-exporting nation, is directly exposed to oil price cycles, while Thailand's large import dependence on energy also renders it vulnerable to external shocks in global oil markets. In contrast, Singapore shows reduced sensitivity, possibly due to its diversified economic base and more mature financial market infrastructure that allows better absorption of commodity-driven volatility.

Thirdly, Granger causality analysis confirms statistically significant bidirectional relationships between oil prices and stock market returns in Vietnam and the Philippines. This indicates a two-way transmission of information and influence, where not only do oil price shocks affect equity returns, but changes in these countries' equity markets may also reflect and potentially forecast movements in oil prices. Such feedback mechanisms suggest an increasing integration of these emerging ASEAN markets into the global financial and commodity system.

Overall, the findings emphasize the heterogeneous nature of volatility dynamics across ASEAN economies and underline the importance of understanding localized structural characteristics when designing investment strategies or policy responses. From a practical standpoint, investors should consider country-specific exposure to energy prices in their portfolio allocation, while policymakers should recognize the potential for external energy shocks to destabilize domestic financial systems and incorporate volatility management tools accordingly.

These insights contribute to the broader literature on energy-finance linkages and offer updated post-pandemic perspectives on volatility behavior in Southeast Asia's financial markets.

5. CONCLUSION

This study confirms that volatility spillovers from global oil prices to ASEAN equity markets persist in the post-pandemic period (2021-2023), although with reduced intensity compared to the COVID-19 crisis. The EGARCH model results demonstrate that asymmetric volatility—especially from negative shocks—has diminished, suggesting increased market resilience. Nevertheless, oil remains a significant driver of stock market volatility, particularly in economies with structural energy dependencies such as Malaysia and Thailand.

Cross-country differences are evident. Malaysia and Vietnam exhibit strong volatility persistence and responsiveness, while Indonesia and the Philippines show relatively lower sensitivity and faster volatility decay. The Granger causality tests further reveal heterogeneous causal linkages: Malaysia and Vietnam experience unidirectional or bidirectional influences between oil prices and stock returns, whereas other countries show weaker or insignificant relationships.

These findings affirm both research questions: first, that volatility transmission from oil markets remains a relevant factor for ASEAN equities in the recovery era, and second, that the intensity and nature of these spillovers differ across countries due to structural, economic, and financial factors.

From a policy standpoint, ASEAN governments should enhance financial buffers, improve transparency in energy markets, and diversify energy sources to mitigate external shocks. Investors, meanwhile, may benefit from tailoring country-specific risk strategies and incorporating oil sensitivity in portfolio decisions across the region.

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Any remaining errors are solely the responsibility of the authors.

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