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Research Article

Market Efficiency of the Next 11 Countries' Stock Markets: Evidences From the Price–Volume Relationship

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Abstract: The Efficient Market Hypothesis (EMH), first proposed by Eugene Fama, has been the subject of numerous academic studies since its inception. Market efficiency holds great significance for ensuring accurate pricing mechanisms and reducing information asymmetry among economic units. This, in turn, can create a domino effect by enhancing investor confidence, thereby enabling the financial system to operate more efficiently. This study investigates the efficiency of stock markets in Next 11 countries within the context of the price-volume relationship. To this end, benchmark indices representing the stock markets of the relevant countries have been utilized. The study covers the year 2024 and analyzes data at 30-minute intervals. The causal relationship between price and volume data of the indices was examined using the Toda-Yamamoto test. According to the research findings, a causality from volume to price was identified for the benchmark indices of the Philippines and Vietnam, whereas a causality from price to volume was observed for the benchmark indices of Egypt and South Korea. For the benchmark index of Türkiye, a bidirectional relationship was found. These results particularly provide evidence regarding the efficiency of stock markets in the Philippines and Vietnam.

Keywords: Next 11, Market Efficiency, Price, Volume, Toda-Yamamoto

1. Introduction

The Efficient Market Hypothesis (see Fama, 1970, for more details) posits that in efficient markets, it is impossible for investors to achieve abnormal returns, meaning they cannot systematically outperform the overall market, as the current stock price reflects all publicly available information about the company. Within the framework of this hypothesis, market efficiency is categorized into three forms. The first form, known as the weak form, suggests that the current stock price fully incorporates all past price movements of the stock. This renders technical analysis ineffective for investment decisions. However, fundamental analysis may still have some utility in predicting future price movements. The second form of market efficiency is defined as the semi-strong form. In semi-strong efficient markets, current stock prices reflect not only past price movements but also all publicly available information about the company. Within this form, both technical and fundamental analysis are theoretically rendered ineffective for predicting future price movements. The only theoretical way to achieve abnormal returns in such markets would be through the use of non-public information obtained by insiders. The third form within the EMH framework is the strong form. At this level of efficiency, all stock prices accurately reflect all available information about the company, including both public and private information. As a result, it is theoretically impossible to achieve abnormal returns within the market.

However, the EMH is not universally accepted. Critics argue that markets are not always efficient and that prices do not always reflect the true value of securities. This skepticism is particularly pronounced during periods of financial bubbles or excessive volatility, where market efficiency is called into question. Consequently, the efficiency of markets has been a long-standing subject of academic research (Timmermann & Granger, 2004; Malkiel, 2005; Ball, 2009; Borges, 2010; Lao & Singh, 2011; Choi, 2021; Akbar et al., 2024).

The study focuses on the Next 11 countries, a group identified by Goldman Sachs as comprising 11 nations with significant potential for future rapid economic growth. These countries were selected

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based on factors such as economic dynamism, demographic advantages, natural resources, and emerging market characteristics. Goldman Sachs described these countries as the future BRICS (Brazil, Russia, India, China, South Africa) nations and potential rivals to the G7 (Goldman Sachs, 2007).

Emerging markets often exhibit structural differences when compared to developed economies. These include limited financial infrastructure, higher levels of information asymmetry and greater political and economic volatility. Such conditions can hinder market efficiency. Therefore, understanding the structural characteristics of these markets is essential when evaluating their efficiency.

The efficient functioning of financial markets plays a crucial role in reducing market volatility and enabling investors to make more rational decisions. This, in turn, has the potential to facilitate resource allocation between economic agents and indirectly contribute to economic development. Within this context, the study examines the efficiency of stock markets in the Next 11 countries, which possess significant potential to influence the global economy. To achieve this, the price-volume relationships in the benchmark indices of the stock exchanges in these countries were analyzed.

Theoretically, in an efficient market, volume is expected to lead price changes. This is because an increase in volume occurs as a result of rational investment decisions, which indicate higher demand for a financial asset, subsequently driving up its price. Conversely, a decrease in demand leads to a reduction in volume and, consequently, a decline in price. On the other hand, a price-driven change in volume is considered indicative of market inefficiency. In such cases, price fluctuations (regardless of their cause) can trigger herd behavior, resulting in corresponding changes in volume.

From this perspective, a causal relationship from volume to price signals market efficiency, whereas a causal relationship from price to volume suggests inefficiency in the market structure (Abinaya et al., 2016, p. 1886).

Given the importance of the Next 11 economies for global investors and their rapidly evolving financial markets, empirical research into the market efficiency of these economies is both timely and necessary. By analyzing the direction of causality between volume and price, this study provides valuable insights into the informational efficiency of these markets. The results can help inform regulatory frameworks, enhance investor decision-making, and contribute to the broader discourse on emerging market development.

The Next 11 countries are significant for both the global economy and financial investors due to their economic potential. However, there is a gap in the literature regarding the investigation of the efficiency of these countries' stock markets. This gap serves as the primary motivation for this study.

2. Literature

Copeland (1976) is one of the pioneering studies examining the interaction between price and volume in markets. The study emphasized that when new information reaches investors with the same level of knowledge, it shifts the demand curve and ultimately establishes a new equilibrium once the information reaches all investors. Similarly, Karpoff (1987) reported a positive interaction between price and volume in stock markets.

Hiemstra and Jones (1994) examined the linkage between Dow Jones stock returns and NYSE trading volume in their study, identifying an asymmetric causality relationship from trading volume to returns. Similarly, Blume and colleagues (1994) stated that changes in trading volume could be used to predict stock prices. In subsequent periods, the relationship between price and volume has become one of the widely used methods for investigating the Random Walk Theory (see Fama, 1970 for more details) and the efficiency of financial markets.

Ghysels and colleagues (2000) investigated the interaction between stock price and volume in a study conducted with a broad sample on a single stock. They reported a linkage between price and volume, noting that the direction of this relationship varied seasonally.

Chordia and Swaminathan (2000) reported that trading volume is a significant determinant of the lead-lag observed in stock returns.

Chen and colleagues (2001) found a linkage between price and volume in all 9 countries covered in their study, which examined stock markets. They observed that in some countries the relationship ran from volume to price, while in others it ran from price to volume.

Rashid (2007) identified a linear relationship between stock prices and trading volume in his study on the Karachi Stock Exchange.

Gagnon and Karolyi (2009), in their study examining the relationship between returns and trading volume of 556 foreign stocks cross-listed on U.S. markets, reported a positive relationship between returns and trading volume.

Chen (2012) examined the interaction between price and volume based on sub-periods in the S&P 500. He concluded that stock prices are effective in predicting trading volume during both bear and bull markets.

Gündüz and Hatemi-J (2014) examined the price-volume relationships in the stock markets of five countries within the context of market efficiency. In Poland, a causality from volume to stock prices was identified, while in Russia and Türkiye, a causality from stock prices to volume was observed.

Abinaya and colleagues (2016) found a one-way linkage between price and volume in all Nifty 50 stocks, except for six stocks.

Nasiri and colleagues (2018) demonstrated, in their research using Bohmian quantum mechanics, the effect of trading volume on stock prices.

Li and colleagues (2021) explored the asymmetric price-volume linkage in U.S. stock markets using a novel approach. The researchers developed a heterogeneous agent model and found that the interactions between fundamentalist and technical analyst agents in the model effectively shaped price-volume dynamics.

Çıralı (2022) examined the efficiency of the stock markets of 25 countries within the framework of the volume-price relationship. The study concluded that the U.S. market was the most efficient, with a higher volume-price linkage compared to Eurozone countries. Additionally, a positive relationship between price and volume was identified in China, the United Arab Emirates, and Qatar, which was associated with the behavioral characteristics of investors.

Li and colleagues (2024) examined the price-volume interaction in the Chinese stock market using the Hurst-based market-trend index. They reported that this index was successful in explaining the dynamics of the price-volume relationship.

In some studies, no strong linkage between price and trading volume has been found (Saatcioglu & Starks, 1998; Lee & Rui, 2002). However, studies with such results are relatively limited in number.

The relationship between price and volume has not only been addressed within the context of stock markets in the literature, but has also been the subject of research in other financial markets such as futures markets and cryptocurrency markets (He & Wen, 2015; Balcilar et al., 2017; Kurihara & Fukushima, 2017; Moyo & Phiri, 2023; Yang et al., 2023; Kumar et al., 2023; Wang & Hui, 2024).

On the other hand, market efficiency has also been the subject of numerous studies focusing specifically on the Turkish stock market. Some of these studies have concluded that the Turkish stock market

exhibits a random walk behavior and, in this regard, shows weak-form efficient (Eken & Adalı, 2008; Zeren et al., 2013; Yücel, 2016). In contrast, other studies have found that the Turkish stock market does not operate efficiently (Malcıoğlu & Aydın, 2016) or that its efficiency deteriorates during extraordinary periods such as the COVID-19 pandemic (Alkan, 2023).

3. Data and Methodology

This section provides a detailed description of the data used in the study. Additionally, this section includes information about the Toda-Yamamoto test employed to achieve the study's objective and the unit root tests utilized to determine the maximum degree of integration of the time series, which is necessary for the application of the Toda-Yamamoto test.

3.1. Data

The study examines the price and volume relationship of benchmark stock indices for Next 11 countries. Bangladesh, Iran and Pakistan were excluded from the research scope due to incomplete access to both price and volume data. The analysis focuses on the stock indices of the remaining eight Next 11 countries, utilizing 30-minute closing data for the period from January 1, 2024, to December 31, 2024. The data used in the study were sourced from Refinitiv Eikon. Index price values were analyzed in USD currency, and both price and volume data were included in the study using their natural logarithms. Descriptive information about these indices is provided in Table 1, and the price-volume charts for the research period are shown in Figure 1.

Table 1

Data Information

Countries	Index Name	Index Code
Egypt	Egyptian Exchange Index 30	EGX 30
Indonesia	Jakarta Composite Index	JKSE
Mexico	Bolsa Mexicana de Valores - IPC	BOLSA
Nigeria	NGX All Share Index	NGX
Philippines	Philippines Stock Exchange Index	PSI
South Korea	Korea Composite Stock Price Index	KOSPI
Türkiye	Borsa Istanbul 100 Index	BIST 100
Vietnam	VNI Vietnam Index	VNI

In Table 1 the countries are listed in alphabetical order. In the remainder of the study, the indices will be referred to by their index codes.

Figure 1

Price and Volume Charts

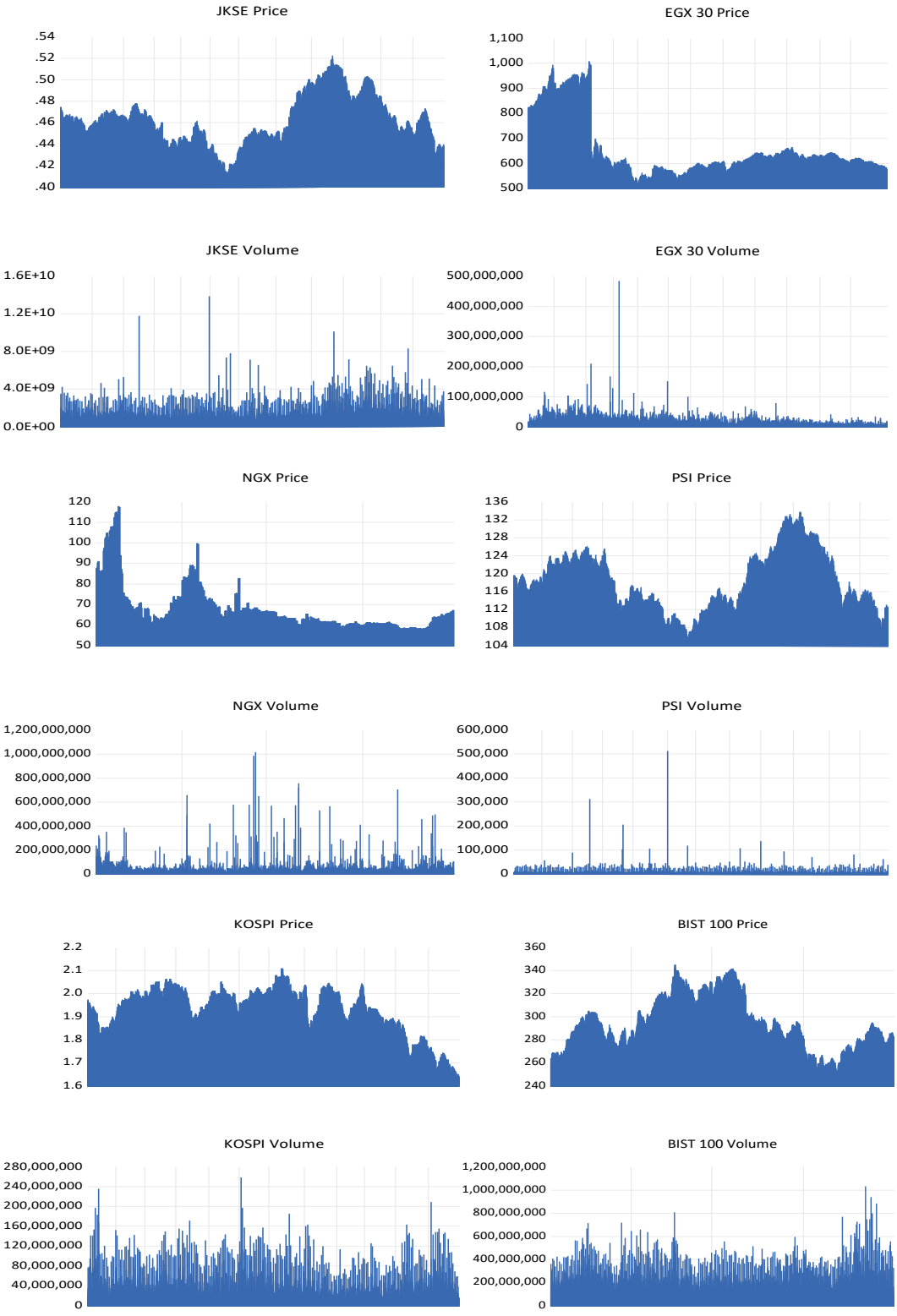
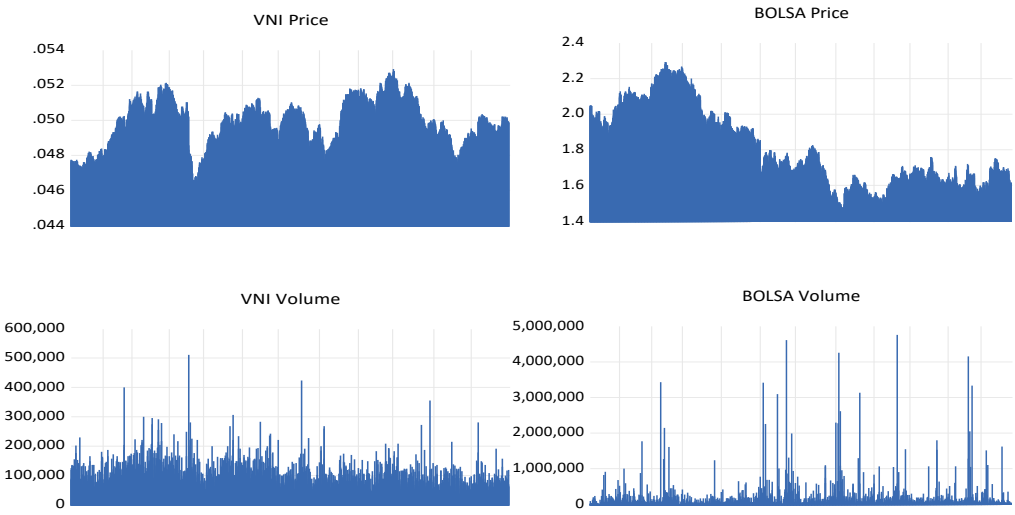


Figure 1 (Continued)



3.2. Unit root tests

The Augmented Dickey-Fuller (ADF) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests were used to determine the maximum order of integration of the time series utilized in the study.

The ADF test, developed by Dickey and Fuller (1979, 1981), is employed to examine the trend and stationarity properties of time series. The equation for the ADF test (trend and intercept) is presented in Equation 1.

$$\Delta Y_t = \alpha + \beta t + \delta Y_{t-1} + \sum_{J=1}^{p} \delta_i \Delta Y_{t-j} + e_t \quad (1)$$

In the model, the t-statistic of the lagged value of Y_t represents the ADF test statistic. According to the model; if $\delta = 0$, the series contains a unit root and is non-stationary. If $\delta < 0$, the series does not contain a unit root and is stationary.

Kwiatkowski and colleagues (1992) developed a unit root test that evaluates the hypothesis of the random walk has zero variance using the LM statistic. Unlike the ADF test, in this test, the null hypothesis states that the series is stationary. The equation for the KPSS test is presented in Equation 2.

$$\hat{\eta} = \frac{1}{T^2} \sum_{t=1}^{T} S_t^2 / \hat{\sigma}^2 \quad (2)$$

If the calculated test statistic is smaller than the critical value, the null hypothesis is not rejected, and the series is considered stationary.

3.3. Toda-Yamamoto test

The Toda-Yamamoto test is an advanced version of the Granger causality test (Granger, 1969) used in time series analysis to determine causality relationships. This method, developed by Toda and Yamamoto (1995), is designed to address challenges related to stationarity and integration levels in time series data. Compared to traditional methods that require data transformations such as differencing or stationarization, it offers a more flexible approach. The fundamental principle of the Toda-Yamamoto test is to use an augmented VAR (k+dmax) model to analyze causality relationships. The method can be applied regardless of whether the series are stationary I(0), first-difference stationary I(1), or have higher levels of integration. However, the Toda-Yamamoto test, which is applicable even when time series are non-stationary or cointegrated, requires that the maximum order of integration (dmax) does not exceed the optimal lag length (k). The equation for the Toda-Yamamoto test is presented in Equation 3.

$Y_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i} Y_{t-i} + \sum_{j=k+1}^{d_{max}} \alpha_{2i} Y_{t-j} + \sum_{i=1}^{k} \Phi_{1i} X_{t-i} + \sum_{j=k+1}^{d_{max}} \Phi_{2j} X_{t-j} + \sum_{i=1}^{k} \Omega_{1i} X_{2t-i} + \sum_{j=k+1}^{d_{max}} \Omega_{2j} X_{2t-j} + \ldots + \varepsilon_{it}$ (3)

Consequently "X_1 does not Granger cause Y" if $\Phi_{1i} = 0 \forall_i$ or "X_2 does not Granger cause Y" if $\Omega_{1i} = 0 \forall_i$.

4. Results

Table 2 reports descriptive statistics for the time series in the study.

Table 2

Descriptive Statistics

Variables	Mean	Max.	Min.	Std. Dev.	Skewness	Kurtosis	Obs.
EGX 30-P	6.4747	6.9160	6.2270	0.1644	1.4298	3.7152	2128
EGX 30-V	16.7116	20.0003	5.0106	0.8657	-4.8709	58.7365	2128
JKSE-P	-0.7730	-0.6502	-0.8908	0.0485	0.2165	2.6966	2987
JKSE-V	20.6527	23.3500	14.9568	1.0177	-1.9991	8.2507	2987
BOLSA-P	0.5837	0.8290	0.3670	0.1194	0.3983	1.8698	3187
BOLSA-V	10.8380	15.3716	5.0172	1.2441	-0.1492	4.2167	3187
NGX-P	4.2126	4.7687	4.0590	0.1469	1.8137	6.0542	2414
NGX-V	17.4112	20.7378	13.2659	0.7723	0.1901	4.8883	2414
PSI-P	4.7737	4.8965	4.6504	0.0543	0.2121	2.2603	2167
PSI-V	8.9668	13.1502	7.0934	0.6752	1.0413	4.9270	2167
KOSPI-P	0.6568	0.7468	0.4852	0.0545	-1.1009	3.5683	3599
KOSPI-V	17.0728	19.3721	12.5672	0.6412	0.2499	4.0021	3599
BIST 100-P	5.6802	5.8426	5.5212	0.0770	0.2231	2.1606	4320
BIST 100-V	18.6919	20.7544	16.3019	0.6536	-0.6052	4.4963	4320
VNI-P	-2.9984	-2.9392	-3.0793	0.0270	-0.3452	2.5440	2205
VNI-V	11.2546	13.1443	10.0464	0.4765	0.1693	2.7073	2205

Note: At the end of the variables, "P" represents Price and "V" represents volume.

Table 2 presents the descriptive statistics of the price and volume series for the benchmark stock indices of the Next 11 countries included in the study. These statistics offer initial insights into market behavior and volatility characteristics across various emerging markets. The average log-price values vary significantly across indices. The highest mean log-price is observed in EGX 30, at 6.47, while the lowest is in VNI, at -2.99. These values reflect differences in index levels and do not directly indicate return potential but offer a sense of the relative price scale. In terms of trading volume, JKSE and BIST 100 exhibit the highest average log-volumes, suggesting more active trading activity, whereas PSI and BOLSA show relatively lower trading volumes, which may indicate limited liquidity or smaller market participation. The standard deviation values highlight the volatility structure of the markets. Among price series, VNI and JKSE display relatively low standard deviations, indicating more stable price behavior, while EGX 30 and NGX show higher standard deviations, implying greater price fluctuations during the period. Regarding volume, BOLSA stands out with an extremely high standard deviation of 1.24, indicating significant variation in trading activity, which may be driven by speculative trading or capital flow volatility. In contrast, VNI and KOSPI have relatively lower volume volatility.

ADF and KPSS unit root tests were conducted prior to the Toda-Yamamoto test to determine the maximum order of integration of the time series. For the ADF, the Schwarz Information Criterion (SC) was used to determine the optimal lag length. For the KPSS, the spectral estimation method was selected as Bartlett kernel, and the suitable bandwidth was determined using the Newey-West method. The results of the unit root tests are presented in Table 3.

Table 3

Unit Root Tests

Variables	ADF (Intercept and Trend)		KPSS (Intercept and Trend)	
	Level	1st Dif.	Level	1st Dif.
EGX 30-P	-1.9252 (0)	-46.3602* (0)	0.9719 (35)	0.0534* (15)
EGX 30-V	-28.0308* (1)	-	0.3370 (18)	0.0447* (175)
JKSE-P	-1.2328 (0)	-52.0034* (0)	0.6400 (43)	0.1465** (14)
JKSE-V	-6.0431* (28)	-	0.2305 (30)	0.0264* (77)
BOLSA-P	-2.6183 (1)	-61.7498* (0)	0.8345 (43)	0.0584* (22)
BOLSA-V	-7.8911* (27)	-	0.1206*** (32)	0.0176* (109)
NGX-P	-2.4884 (0)	-48.6456* (0)	0.2579 (39)	0.0306* (7)
NGX-V	-5.7042* (19)	-	0.3842 (32)	0.0031* (8)
PSI-P	-1.2333 (0)	-46.0898* (0)	0.5675 (35)	0.14363** (4)
PSI-V	-6.7047* (18)	-	0.2071*** (23)	0.0622* (80)
KOSPI-P	-1.3000 (0)	-57.9959* (0)	1.2715 (45)	0.0367* (6)
KOSPI-V	-4.1612* (29)	-	0.2570 (32)	0.0180* (50)
BIST 100-P	-2.0611 (0)	-63.4922* (0)	1.3410 (52)	0.0920* (17)
BIST 100-V	-7.3477* (18)	-	0.8057 (32)	0.0233* (190)
VNI-P	-2.6871 (1)	-42.6339* (0)	0.2631 (35)	0.0359* (11)
VNI-V	-4.1882* (26)	-	0.3008 (14)	0.0184* (76)

Note: Values in parentheses indicate lag lengths (for ADF test) and bandwidths (for KPSS test). The symbols * denote 1%, ** denote 5% and *** denote 10% significance levels.

When Table 3 is examined, it is observed that the maximum order of integration for all paired datasets to be subjected to the causality test is 1, according to both the ADF test and the KPSS test results. In the next stage of the Toda-Yamamoto test, the optimal lag lengths were estimated using VAR models established for the paired datasets. The Schwarz Information Criterion was used to determine the optimal lag lengths. The results are reported in Table 4.

Table 4

Optimal Lag Lengths

Lag	EGX 30 P-V	JKSE P-V	BOLSA P-V	NGX P-V	PSI P-V	KOSPI P-V	BIST 100 P-V	VNI P-V
0	1.734	-0.343	1.862	1.285	-0.923	-1.021	-0.301	-3.041
1	-3.772	-6.291	-4.061	-3.788	-6.686*	-6.918	-6.606	-7.927
2	-3.800	-6.290	-4.070*	-3.792	-6.675	-6.930*	-6.654	-7.930
3	-3.803*	-6.284	-4.067	-3.795	-6.664	-6.928	-6.655*	-7.923
4	-3.797	-6.277	-4.063	-3.796*	-6.680	-6.920	-6.653	-7.973
5	-3.794	-6.269	-4.056	-3.795	-6.673	-6.912	-6.651	-7.965
6	-3.791	-6.262	-4.050	-3.784	-6.662	-6.912	-6.648	-7.978
7	-3.786	-6.357*	-4.042	-3.776	-6.651	-6.913	-6.648	-7.975
8	-3.784	-6.355	-4.037	-3.766	-6.671	-6.911	-6.645	-8.018*

When Table 4 is examined, it is determined that k=3 for EGX 30 and BIST 100, k=7 for JKSE, k=2 for BOLSA and KOSPI, k=4 for NGX, k=1 for PSI, k=8 for VNI. In all models, it was determined that the optimal lag length is greater than the maximum order of integration, and thus, there are no constraints for applying the Toda-Yamamoto test. Additionally, the diagnostic tests applied to the models reveal that the inverse roots of the autoregressive polynomial in all models are less than 1.

Therefore, all models are stationary at the specified lag orders, and no autocorrelation problem exists in the models.

The results of the Toda-Yamamoto test are reported in Table 5.

Table 5

Causility Tests

Model	Independent	Dependent	Chi-Sq	Prob.	Granger
EGX30 P-V	EGX 30-P	EGX 30-V	5.6691	0.0587***	✓
	EGX 30-V	EGX 30-P	1.3897	0.4991	X
JKSE P-V	JKSE-P	JKSE-V	8.8024	0.2671	X
	JKSE-V	JKSE-P	10.7716	0.1488	X
BOLSA P-V	BOLSA-P	BOLSA-V	1.4844	0.4760	X
	BOLSA-V	BOLSA-P	0.9728	0.6148	X
NGX P-V	NGX-P	NGX-V	2.7064	0.6080	X
	NGX-V	NGX-P	2.1867	0.7014	X
PSI P-V	PSI-P	PSI-V	0.8639	0.3526	X
	PSI-V	PSI-P	6.1110	0.0134**	✓
KOSPI P-V	KOSPI-P	KOSPI-V	7.3429	0.0617***	✓
	KOSPI-V	KOSPI-P	2.4215	0.4896	X
BIST 100 P-V	BIST 100-P	BIST 100-V	115.6029	0.0000*	✓
	BIST 100-V	BIST 100-P	9.8749	0.0196**	✓
VNI P-V	VNI-P	VNI-V	12.2594	0.1399	X
	VNI-V	VNI-P	49.4869	0.0000*	✓

Note: At the end of the variables, "P" represents Price and "V" represents Volume. The symbols * denote 1%, ** denote 5% and *** denote 10% significance levels.

When Table 5 is examined, the null hypotheses stating that EGX 30-P is not the Granger cause of EGX 30-V, PSI-V is not the Granger cause of PSI-P, KOSPI-P is not the Granger cause of KOSPI-V, BIST 100-P is not the Granger cause of BIST 100-V, BIST 100-V is not the Granger cause of BIST 100-P, and VNI-V is not the Granger cause of VNI-P are rejected. For the remaining variables, the null hypotheses could not be rejected, indicating that there is no causal relationship between the variables.

The direction of causality between price and trading volume can provide valuable insights for informed investment strategies. In markets where trading volume Granger-causes price, volume data may serve as a leading indicator, allowing investors to anticipate price movements based on shifts in market participation or liquidity. Conversely, in cases where price changes, Granger-cause volume, behavioral patterns such as herd behavior, overreaction or momentum trading may be more prevalent, indicating that investor decisions are more reactive than anticipatory. In markets where a bidirectional relationship exists, more nuanced strategies that combine technical analysis with volume-based signals may be more effective.

5. Conclusion

The Next 11 countries, particularly with their potential for economic growth, are composed of nations capable of altering international economic balances in the near future. One of the key tools for achieving healthy and sustainable economic growth is the presence of sufficiently deep and broad capital markets. The level of development in capital markets not only facilitates the transfer of funds between capital owners and economic entities in need of financing but also contributes to economic welfare by ensuring the widespread distribution of capital. One of the primary factors positively influencing the development of capital markets is the efficient structure of stock markets.

This study examines the efficiency of stock markets in the Next 11 countries within the context of the price-volume relationships in their benchmark indices. Statistically significant causal relationships were found from price to volume in the EGX 30 and KOSPI indices, and from volume to price in the PSI and VNI indices. In the BIST 100 index, this relationship was determined to be bidirectional. Theoretically, this indicates that the stock markets of the Philippines and Vietnam exhibit an efficient structure, whereas the stock markets of Egypt and South Korea do not. For Türkiye, the bidirectional relationship makes it challenging to comment definitively on the market's efficiency.

Among the eight Next 11 countries analyzed in this study, five stock markets exhibit at least a unidirectional relationship between price and volume or volume and price. This finding supports the prevailing view in the literature that there is a linkage between price and trading volume (Blume et al., 1994; Ghysels et al., 2000; Chen et al., 2001; Gagnon & Karolyi, 2009; Gündüz & Hatemi-J, 2014; Abinaya et al., 2016; Li et al., 2024, among others). The three exceptions identified in the study are the JKSE, BOLSA and NGX markets. Notably, these markets are also among the top four with the highest trading volume volatility. This may suggest a lack of sufficient individual investor participation (either to ensure market efficiency or to trigger herding behavior) capable of generating such dynamics.

The nature of the causality between price and trading volume carries important implications for policymakers and market regulators. In markets where price movements Granger-cause changes in volume, speculative behavior and herding tendencies may be more pronounced, suggesting the need for enhanced monitoring of market manipulation and efforts to reduce information asymmetry. Conversely, in markets where volume leads price, the trading activity likely reflects the dissemination of new information, indicating a relatively more efficient market structure. In such cases, regulatory efforts could focus on further strengthening market infrastructure and encouraging deeper and broader investor participation. In environments characterized by inefficiency or bidirectional interactions, promoting financial literacy and behavioral awareness among individual investors may also help to improve the quality of investment decisions and overall market stability.

Considering the characteristics of the markets examined in this study, increasing stock market liquidity in emerging economies such as the Philippines and Mexico is crucial for ensuring that these markets attain sufficient and necessary depth and breadth. In this context, the expansion of market-making programs, investor-oriented regulatory incentives and the enhancement of product variety could be prioritized. Moreover, in markets like Mexico, where intraday volume volatility is pronounced, regulatory authorities might consider implementing or tightening measures such as intraday trading limits, circuit breakers, or transparency-enhancing reporting policies. Likewise, excessive price volatility can undermine investor confidence, destabilize the market and negatively affect the depth of stock markets. In this regard, countries such as Egypt and Nigeria, where high price volatility has been identified relative to other Next 11 countries, may benefit from reinforcing intraday price fluctuation limits and/or circuit breaker mechanisms.

Continued research on the efficiency of stock markets in the future will enhance investors' ability to make predictions and allow them to make more rational financial investment decisions. The Next 11 countries remain a significant area for further exploration, as their geopolitical positions and youthful populations significantly increase their importance in the global economy.

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