Weak Form Market Efficiency: Evidence from Developing and Emerging Markets

Ume Salma Akbar
Assistant Professor at Sukkur IBA University Sukkur, Sindh, Pakistan.
Email: u.salma@iba-suk.edu.pk

Niaz Ahmed Bhutto
Professor, Sukkur IBA University, Sukkur Sindh, Pakistan.
Email: niaz@iba-suk.edu.pk

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Abstract

This paper attempts to investigate the weak form of market efficiency in developing empirically and emerging countries' capital markets including (India, China, Pakistan, Malaysia Philippines and Indonesia) Couple of studies has been conducted internationally to find out market efficiency and its form in several countries by multiple authors through different methodologies yet a gap exists to search central and East Asian countries on one platform. The panel data consists of the time series data of six Asian countries. Data has been obtained from Bloomsburg database from January 2009 to December 2019. By utilizing unit root test, GARCH (1, 1) model and variance test ratio. The results show no evidence of the weak form of efficiency in sample countries. Similar sort of studies has been conducted globally for testing efficient market hypothesis this is a very first time that developing and emerging countries of Asia are being taken.

Keywords: Efficient Market Hypothesis, Unit Root Test, GARCH (1,1), Variance Test Ratio.

1. Introduction

The Capital markets are the principal source of economic growth for any economy. One of its crucial functions is to channelize saving into investment (Iqbal et al., 2021) and (Sudhahar and Raja, 2010). Hence in the allocation financial resources capital market take the significant part in. The allocation is being done at marketplace via securities' pricing phenomenon, so the pricing trend can be an opportunity for the investor if goes appropriately so investors can be motivated in this regard. The capital market is called efficient where stock prices be a sign of all stock related information, so this is information and its dissemination that make the market efficient. And the degrees of efficiency are determined by how fast and accurately stock prices reflect that particular information. The proposition that markets are efficient is one of the fundamental building blocks of modern financial markets (Junejo et al., 2022). The accepted efficient market hypothesis finely explains the theory of market efficiency. The efficient market functioning can be pushing factor for the growth of the economy. This is acknowledged inception that when any information arises, it must be spread very rapidly and should be added to securities prices without any setback.

Therefore, the securities prices reflect all publicly available information about security; likewise, the current market price can be an unbiased estimate of the value of investment in any financial market where efficient market hypotheses hold (Naveed et al., 2023). Thus, efficient market hypothesis is nothing but the relationship between information and security prices. As new information is continuously entering into market many more sources as financial and economic reports, firms' announcements, political news and statements and public surveys.

So, if the market is efficient, then investors and traders' chances for having superior profit expectation are quite uncertain even by adopting specific suitable trading strategies, as all the on hand available information is already included into security prices. Here the fundamental and technical analyses are of no use for the purpose of finding underpriced security if the market is an efficient one. So that could be obtained by holding a randomly selected portfolio of individual stocks with comparable risk(Qalati, Li, et al., 2020) and (Malkiel, 2003).

Nowadays efficient market hypothesis and its predictive relation with stock market return become a significant area to be explored in financial economics. Developed countries are well off in this regard, but the developing countries like Pakistan and certain south Asian countries are still lacking. Now the trend of analysing the weak form of market efficiency has been started in emerging and slowly and gradually is leaning towards developing nations too. This research is primarily for a valuable contribution in economic as well financial growth and development via having efficient capital markets.

The objective of this study is to investigate the weak form of market efficiency by using daily data of six developing and emerging countries named Pakistan, India, Indonesia, Malaysia, Philippines and China respectively. This study is significant for developing, and emerging countries and their stock exchanges are very active as well as volatile one due to security threats, the imposition of changing international policies energy crises and changing thinking pattern and mindset of investors. Hence this study will provide a platform for appropriate decision making for analysing the behaviour of stock prices and how to predict them in the market that holds the weak form of efficiency.

After introduction section, II puts a light on the literature review in both developed as well developing countries. Section III focuses on data and methodology used for the study. Section IV is all about empirical results of the study. While the V part of study consists of results discussion and conclusion.

2. Literature Review

Many more attempts have been there in many countries to investigate the behaviour of the stock market. Lots of controversies have been generated in the world of finance while discussing efficient and inefficient markets. Building Very first work was done by Fama (1965, 1970), Where he made an empirical analysis of financial time series that ever since is serving as an essential building block further that pioneer work added by and study of risky assets' return' serial independence (Qalati, Ahmed, et al., 2020). After the work of Fama, a number of the researcher has taken their part in this arena of the capital market to find the

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stock price random movements. Researchers are having a broad perspective of exploring capital market efficiency in their minds.

The research works of Fama (1970), Solink (1973), Granger (1975), Sohu et al., (2020) and Hawawini (1984) were done the under the umbrella of the market efficiency of developing and emerging countries. While talking about developing countries Sharma (1983) taken into account 23 Indian companies listed on the BSE whereby utilising moving average form of the random walk he concludes that previous shocks do not possess any power to influence future shocks of stock prices. Beside this many studies do not support weak form efficient market, as studies of Kulkarni (1978), , (Qalati et al., 2021) Chaudhury (1991), (Dakhan et al., 2021), Kim, Nelson and Startz (1991) (Sohu et al., 2022) and Shiguang and Barnes (2001), these studies push investors to design the trading strategies where they can grab abnormal profits by having information about past trends of stock prices.

On another hand Culter, Porterba and Summer (1990), find any evidence of mean reversion and predictability of US stock markets return. While keeping in view the random pattern of stock returns study of Kim, Nelson and Startz (1991) that is being done on five pacific basin stock markets explores other than Japan all other counties of the sample do not the random walk.Ahmed (2022), Huang (1995), Dahel and Laabas (1999), Grieb and Reyes (1999), Ojah and Karemera (1999), Magnusson and Wydick (2000), Pagan and Soydemir (2000), Mings and Guru (2000), Yasir and Kashif (2005) and Mobarek, (Dakhan et al., 2020) and Keavin (2000) all of these researchers worked on Dhaka Stock Exchange for getting an evidence of weak form market efficiency. Where numbers of tests and methodologies as the run test, autoregression and autocorrelation were incorporated into studies to analyse a data of monthly returns consisting of the time span of 1988 to 1997 and come about with a conclusion there is no existence of a weak form of efficiency in return series. By employing serial correlation method on the data consist of period 1985 -1989

Butler and Malaikah (1992) examine the behaviour of individual stocks returns of two different stock markets of Saudi Arabia and Kuwait, where they find the Kuwait market is efficient one where the stock market of Saudi Arabia shows a significant departure pattern from random walk theory. The same story of departures from random walk once again finds by Madhusoodanan (1998) and (Shah et al., 2021) by keeping under consideration the Indian stock market BSE.

Another study is conducted on Nigerian Stock market by Olowe (1999) by using correlation analysis on the monthly stock return for the period of January 1981 to December 1992 and bring the results that Nigerian stock market is weak form efficient.

Chinese stock markets are examined by (Shiguang and Barnes 2001; (Sohu et al., 2019) who taken into account both Shanghai and Shenzen stock market for the evidence of following efficient market hypotheses by running different as serial correlation, variance teat ratio and run test on the daily, weekly and monthly data, and come up with a conclusion that Chinese stock markets are not weak form efficient. Once again Saudi Arabia and Kuwait were analyzed by (Abraham et al. 2002), (Junejo et al., 2020), (Iqbal et al., 2019), and (Sohu et al., 2020) but this study includes Bahrain too, studies try to find out evidence for random walk hypotheses for the stock exchanges of three countries and concludes that yes two countries Saudi Arabia and Bahrain follow casual walk trend while in the case Kuwait random walk pattern is absent. Furthermore, the study of Cooray and Wickremasingle (2005) investigate a weak-form efficiency in the stock markets of India, Sri Lanka, Pakistan and Bangladesh. According to only Bangladesh is not supporting the weak form of efficient and rest of the sample countries (Pakistan, India and Sri Lanka) are weak form productive stock market counties. Still, the empirical evidence is mixed for the analysis of efficient market hypotheses in any of its degree where some studies accept the weak form of efficiency while others not. Hence is become essential to re-examine this controversy of efficient market hypothesis for developing and emerging countries.

3.Data and Methodology

The objective of this study is the re-investigating weak form of efficient market hypothesis in the context of developing and emerging countries. The sample of the survey consists of six countries Pakistan, India, China, Philippines, Indonesia and Malaysia for the time span of January 2009 to December 2019 presented in table 1. The stock market indices for the six Asian stock markets are Shanghai Composite Index (SSEC) for China, the Jakarta Composite Index (JKSE) for Indonesia, the Kuala Lumpur Composite Index (KLCI) for Malaysia, the Philippines Stock Exchange Composite Index (PSE) for the Philippines, Bombay stock exchange for (BSE) for India and Karachi Stock Exchange (KSE) for Pakistan. Our sample does not include the dates when stock prices are not available (as in 2008 Karachi Stock Exchange remained closed for 110 days that's sample period is starting from 2009) from the Bloomberg database, and consequently the series of index prices are matched for each index The log daily closing stock price indices for sample capital markets are plotted over the sample period.

TABLE 1 Stock Markets Index of Developing and Emerging Countries with Sample Periods

Countries	Index	Founded	From	To
China	Shenzhen SE Composite SUB	1990	1/1/ 2009	30/12/2019
India	BSE (Sensex) 30 Sensitive	1875	1/1/ 2009	30/12/2019
Indonesia	Jakarta Stock Exchange Composite Index	1982	1/1/ 2009	30/12/2019
Malaysia	KLCI Index	1986	1/1/ 2009	30/12/2019
Pakistan	PSX 100	1991	1/1/ 2009	30/12/2019
Philippines	PSEi Index	1992	1/1/ 2009	30/12/2019

The study uses the adjusted daily closing stock price indices to calculate daily stock returns by the formula

Rt = DLn(Pt)*100

n this investigation, we designate 'Rt' as the daily stock return at 't,' a value derived from the closing indices at that precise moment. Our research draws upon two analytical frameworks: the foundational Random Walk (RW) model and the GARCH (1, 1) model. The Random Walk Hypothesis postulates that stock market prices adhere to an intricate, stochastic pattern, rendering them essentially unpredictable. This theory holds two fundamental tenets: firstly, that consecutive price fluctuations are statistically autonomous events, and secondly, these fluctuations conform to a specific probabilistic distribution. To assess the validity of the Random Walk Hypothesis (RWH) within our selected capital markets, our study deploys the Augmented Dickey-Fuller (ADF) unit root test, following the method elucidated by Ramasastri in 1999.

3.1 Unit Root Test

Before subjecting our dataset to any statistical modeling, we diligently execute a unit root test as a preliminary step. This crucial procedure ensures that all variables are in a stationary state, forestalling the potential pitfalls of spurious regression. The chosen method for this unit root testing is the Augmented Dickey-Fuller (ADF) test, as originally proposed by Dickey and Fuller in 1979. The outcomes, thoughtfully presented in Table 3, encompass the ADF test with only a constant term and the ADF test with both a trend and a constant. These results decisively reject the null hypothesis, indicating that returns exhibit a stationary nature, affirming their suitability for subsequent rigorous statistical analysis.

3.2 GARCH(1,1) Model

Additionally, the econometric estimation of the GARCH (1, 1) model is employed to examine the phenomenon of volatility clustering, which, in turn, sheds light on the presence of weak-form market inefficiency. In accordance with the GARCH (1, 1) model, the persistence in volatility clustering signifies the inefficiency of a capital market. The GARCH (1, 1) model, as originally proposed by Bollerslev in 1986, is specified as follows:

GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1) (6)

3.3 Variance Ratio Test

The evaluation of market efficiency is commonly conducted through variance ratio testing, a method that gained significant prominence following the influential work of (Lo & MacKinlay, 1989). In this study, we adhere to the methodology outlined by Charles and Darné (2009). When assessing the Random Walk Hypothesis using the variance ratio test, it is assumed that the variance is linear across all sampling intervals, as prescribed by (Charles & Darné, 2009). For instance, the sample variance of a return over 'n' periods is 'n' times the sample variance of a one-period return. Moreover, the variance ratio at the 'n' lag is defined as the ratio between (1/n) of the 'n'-period return and the variance of the one-period return. Consequently, in the context of the Random Walk Hypothesis, the variance ratio should ideally equal 1 for all values of 'n'.

3.3. 1. LO AND MACKINLAY' (1989) TEST

Lo and MacKinlay (1988) are recognized for their contributions in developing individual variance ratio tests. They advocate for an asymptotic distribution of "VR" ("x;k"), considering 'x' as fixed and 'T' approaching infinity. In the context of conditional heteroscedasticity, the null hypothesis stipulates that V(k) = 1, and the associated test statistic, denoted as M(x;k), is as follows:

$$M(x;k) = \frac{VR(x;k)-1}{\phi^*(k)^{1/2}} \quad (1)$$

Further where,

$$\phi^*(k) = \sum_{t=j+1}^{T} \left[\frac{2(k-j)}{k}\right]^2 \delta(j)$$

$$\delta(j) = \left\{\sum_{t=j+1}^{T} (x_t - \hat{u})^2 (x_{t-j} - \hat{u})^2\right\} \div \left\{\left[\sum_{t=1}^{T} ((x_t - \hat{u})^2\right]^2\right\}$$

3.3.2 WRIGHT (2000) TEST

Lo-MacKinlay tests observed biased and right-skewed along with limited sampling distribution for the finite sample, due to this asymptotic limitation Wright (2000) proposed a variance ratio test based on signs and ranked with a nonparametric property to conventional asymptotic for variance ratio tests. For small size sample Wright's (2000) tests have two folded advantages over the Lo-MacKinlay test (i) No approximation need for asymptotic distribution due to exact sampling distribution of rank (R1 and R2) and sign (S1 and S2) tests (ii) the test is more robust in the comparison of traditional variance ratio tests. Under the i.i.d assumption the ranks-based test does the specific job, show less size distortion, while the signs test goes exactly yet under conditional heteroscedasticity. The first difference of variable is taken with T observations {x1 , . . . , xT} further letting r(x)be the rank of xT among (x1 , . . . , xT) Here the xt is created from i.i.d sequence under the account of null hypothesis while with equal probability r(x) is a random permutation of 1,….,T numbers.
The R1 and R2 as per Wright (2000) defined below.

$$R_1(k) = \left(\frac{(Tk)^{-1} \sum_{t=k}^{T} (r1,t + \ldots + r_{1,t-k+1})^2}{T^{-1} \sum_{t=k}^{T} r_{1,t}^2} - 1\right) \times \emptyset(k)^{-1/2} \quad (2)$$

$$R_2(k) = \left(\frac{(Tk)^{-1} \sum_{t=k}^{T} (r2,t + \ldots + r_{2,t-k+1})^2}{T^{-1} \sum_{t=k}^{T} r_{2,t}^2} - 1\right) \times \emptyset(k)^{-1/2} \quad (3)$$

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Here Φ^{-1} is the inverse form of standard normal cumulative distribution function Further the precisely same distribution is followed by R1 and R2, so by simulating their exact distribution the critical test values can be found.
The first difference signs test is

$$S_1(k) = \left(\frac{(Tk)^{-1} \sum_{t=k}^{T} (s_t + \ldots + s_{t-k+1})^2}{T^{-1} \sum_{t=k}^{T} s_t^2} - 1 \right) \times \emptyset(k)^{-1/2} \tag{4}$$

$$S_2(k) = \left(\frac{(Tk)^{-1} \sum_{t=k}^{T} (\ s_t(\bar{\mu}) + \ldots + s_{t-k+1}(\bar{\mu}\ ))^2}{T^{-1} \sum_{t=k}^{T} S_t(\bar{\mu})^2} - 1 \right) \times \emptyset(k)^{-1/2} \tag{5}$$

4.Results and Discussion

4.1 Descriptive Statistics

Table 2 presents summary statistics for the indices of both developing and emerging countries. These calculations are conducted by taking the logarithm of stock returns. Notably, the data for all countries exhibit leptokurtic behavior, which is a common characteristic of daily stock returns. Furthermore, all countries in the sample, with the exception of the Philippines, display a negative skewness in their return distributions. Additionally, the Jarque-Bera test statistic suggests that daily returns across these countries do not conform to a normal distribution.

TABLE 2 Descriptive Statistics of Developing and Emerging Countries

	China	India	Indonesia	Malaysia	Pakistan	Philippines
Mean	0.000204	0.000431	0.000533	9.04E-05	0.000832	0.000107
Median	0.000701	0.000977	0.000859	0.000290	0.001053	0.000000
Maximum	0.094010	0.159900	0.131277	0.202595	0.085071	0.161776
Minimum	-0.092561	-0.118092	-0.127321	-0.241534	-0.077408	-0.130887
Std. Dev.	0.016104	0.015135	0.016672	0.013993	0.013408	0.014993
Skewness	-0.354240	-0.194441	-0.160286	-0.252077	-0.259823	0.263434
Kurtosis	7.745133	10.34788	10.50897	48.14300	6.981388	13.70804
Jarque-Bera	4056.963	9542.631	9955.912	359223.0	2841.411	20258.12
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

4.2 Empirical Results

As per the weak form of the Efficient Market Hypothesis, stock prices comprehensively embody all historical information available. This proposition posits that future price movements cannot be accurately predicted by solely analyzing past price data, thereby posing a direct challenge to the effectiveness of technical analysis. In a parallel vein, this study emerges as a valuable resource, equipping investors and individuals with insights to make well-informed investment decisions.
Our examination involved the application of the Augmented Dickey-Fuller (ADF) unit root

test across all selected capital markets, with the outcomes meticulously documented in Table-3. It becomes conspicuously apparent that the null hypothesis, suggesting the presence of a unit root and thus non-stationarity, is firmly discarded. This conclusion is drawn as the test statistics significantly exceed the critical values established for each respective country. These compelling findings indicate that stock prices within the chosen emerging and developing capital markets do not adhere to the random walk model. Consequently, these markets cannot be classified as adhering to weak-form efficiency.

Table 3 Unit root Test of Developing and Emerging Countries

	China	India	Indonesia	Malaysia	Pakistan	Philippines
ADF	-38.53321	--36.46671	-34.82578	-32.37696	-38.11994	-34.63682
ADF Trend+Const	-38.51062	-36.73557	-34.95490	-32.38002	-38.36724	-34.71049
ADF with constant	-38.52238	-36.49601	-34.84288	-32.36804	-38.33818	-34.62680

To ensure the robustness of our analysis of financial time series data, we employ the Lagrange Multiplier test on the residuals of the Autoregressive Moving Average (ARMA) model. This test is applied to assess the presence of Autoregressive Conditional Heteroscedasticity (ARCH) based on lag length determined by Akaike and Schwarz information criteria. In the majority of our financial time series data, the magnitude of the residuals provides evidence supporting the existence of significant ARCH (1). This is indicated by the strong presence of conditional heteroscedasticity within the data.

	China	India	Indonesia	Malaysia	Pakistan	Philippines
ARCH (1)	0.03***	0.00***	0.00***	0.001***	0.00***	0.00***

Table 4 ARCH effect of Developing and Emerging Countries

To corroborate the findings from the Augmented Dickey-Fuller (ADF) unit root test and to gain insights into the underlying reasons for these findings, we have conducted estimations of the GARCH (1, 1) model for each market. The outcomes of these estimations are presented in Table 4. The reported results consistently reveal that the value of (α + β) is remarkably close to 1 across all capital markets. This suggests a high degree of persistence in volatility clusters throughout the sample period in these markets. Such a high degree of volatility cluster persistence is indicative of weak-form market inefficiency.

Furthermore, the model's fitness is demonstrated by the low values of the Akaike criterion and Schwarz criterion. These values are well within a range not exceeding three, indicating that we have correctly specified and estimated the equation in accordance with the requirements of the GARCH model. Additionally, none of the coefficients in the model are negative, further affirming the soundness of the model specification and estimation.

Table 5 GARCH (1,1) test of Developing and Emerging Countries

	Variable	Coefficient	Std. Error	z-Statistic	Prob.	Akaike criterion	Schwarz criterion
China	RESID(-1)^2	0.043741	0.006017	7.270091	0.0000	3.343688	3.358043

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	GARCH(-1)	0.944286	0.008581	110.0376	0.0000		
India	RESID(-1)^2	0.094335	0.005447	17.31841	0.0000	3.801879	3.809684
	GARCH(-1)	0.910134	0.003501	259.9999	0.0000		
Indonesia	RESID(-1)^2	0.110156	0.013583	8.109694	0.0000	3.094499	3.094499
	GARCH(-1)	0.868295	0.014506	59.85826	0.0000		
Malaysia	RESID(-1)^2	0.115295	0.007449	15.47876	0.0000	3.835967	3.835967
	GARCH(-1)	0.861824	0.007543	114.2515	0.0000		
Pakistan	RESID(-1)^2	0.079257	0.011440	6.928175	0.0000	2.843257	2.843257
	GARCH(-1)	0.896333	0.013396	66.91232	0.0000		
Philippines	RESID(-1)^2	0.079560	0.009301	8.553979	0.0000	2.891826	2.891826
	GARCH(-1)	0.913709	0.008711	104.8874	0.0000		

The widely-recognized variance ratio tests have yielded intriguing results when probing the validity of the Random Walk Hypothesis. These tests encompass individual variance ratios, comprising the six test statistics devised by Lo and MacKinlay, evaluated under both homoscedasticity (termed M1) and heteroskedasticity (termed M2) conditions. Furthermore, the study incorporates Wright's rank and rank score-based tests, denoted as R1 and R2, and the sign test, both with and without the bootstrap method, referred to as S1 and S2. The null hypothesis in this context centers on the Random Walk Hypothesis (or martingale), and rejection of this null occurs when more than two results attain statistical significance at any of the specified significance levels (1%, 5%, and 10%).

Based on the findings outlined by Wright (2000), the power of the R1 and R2 tests is consistently at least as strong as that of S1 and S2. Table 2 provides evidence of the decisive rejection of the null hypothesis at the 1% significance level for various values of 'K' (specifically, 2, 4, 8, and 16). The rejection of the Random Walk Hypothesis is particularly pronounced in the case of sample countries with extreme values across all 'K' levels. It's worth noting that the values of the test statistics (M1, M2, R1, R2, S1, and S2) are most extreme at 'K' equal to 2 and gradually decrease with higher 'K' levels (4, 8, and 16).

For instance, consider the test statistics for Brazil: they exhibit values of -31.75, -26.10, -19.36, and -13.98 at 'K' levels 2, 4, 8, and 16, respectively. It's also important to highlight that all values of the test statistics in Table 2 carry a negative sign. The holding period, as utilized by Hoque (2007), consists of (2, 4, 8, 16), which are regarded as short for the purpose of

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testing mean reversion.

TABLE 6 CRITICAL VALUES FOR WRIGHT'S: M1, M2, R1, R2 , S1 AND S2

	K	M1	M2	R1	R2	S1	S2
China	2	-18.69***	-11.17***	-17.43***	-18.43***	-12.26***	-11.17***
	4	-15.34***	-9.96***	-14.32***	-15.11***	-9.84***	-9.96***
	8	-11.33***	-8.11***	-10.68***	-11.14***	-7.40***	-8.11***
	16	-8.20***	-6.33***	-7.78***	-8.05***	-5.45***	-6.33***
India	2	-26.48***	-10.97***	-25.45***	-26.61***	-18.18***	-10.97***
	4	-22.20***	-9.85***	-20.46***	-21.67***	-14.72***	-9.85***
	8	-16.33***	-7.77***	-15.07***	-15.89***	-11.01***	-7.77***
	16	-11.81***	-6.45***	-10.77***	-11.43***	-7.88***	-6.45***
Indonesia	2	-19.70***	-10.64***	-18.15***	-19.22***	-13.18***	-10.64***
	4	-15.90***	-9.23***	-14.92***	-15.67***	-10.22***	-9.23***
	8	-12.18***	-7.71***	-11.12***	-11.84***	-7.48***	-7.71***
	16	-8.80***	-6.01***	-8.03***	-8.56***	-5.43***	-6.01***
Malaysia	2	-19.99***	-13.27***	-18.81***	-19.78***	-13.61***	-13.27***
	4	-16.36***	-11.57***	-15.69***	-16.30***	-11.44***	-11.57***
	8	-12.23***	-9.22***	-11.71***	-12.17***	-8.47***	-9.22***
	16	-8.79***	-6.91***	-8.46***	-8.75***	-5.98***	-6.91***
Pakistan	2	-16.71***	-10.00***	-15.19***	-16.32***	-10.77***	-10.00***
	4	-13.82***	-8.86***	-12.83***	-13.61***	-9.39***	-8.86***
	8	-10.19***	-7.03***	-9.61***	-10.04***	-7.31***	-7.03***
	16	-7.39***	-5.34***	-6.94***	-7.25***	-5.26***	-5.34***
Philippines	2	-20.16***	-12.62***	-19.22***	-19.99***	-14.22***	-12.62***
	4	-16.59***	-11.12***	-15.70***	-16.45***	-11.64***	-11.12***
	8	-12.30***	-8.88***	-11.53***	-12.19***	-7.96***	-8.88***
	16	-8.83***	-6.74***	-8.31***	-8.74***	-5.63***	-6.74***

* indicates significance at the 0.10 ** at the 0.05 per ***, and at 0.001 per level

CONCLUSION

This research focuses its scrutiny on the presence of the Random Walk Hypothesis within six emerging and developing Asian countries. The dataset encompasses time series data spanning the Shanghai Composite Index (SSEC) for China, the Jakarta Composite Index (JKSE) for Indonesia, the Kuala Lumpur Composite Index (KLCI) for Malaysia, the Philippines Stock Exchange Composite Index (PSE) for the Philippines, the Bombay Stock Exchange (BSE) for India, and the Karachi Stock Exchange (KSE) for Pakistan. To investigate this phenomenon, a suite of statistical methodologies is employed, encompassing unit root tests, GARCH (1,1) modeling, and variance ratio tests. These variance ratio tests include individual assessments such as the Lo-MacKinlay approach, Wright's (2000) rank-based analyses, and sign tests, in both traditional and bootstrap-enhanced versions. The rationale for employing joint variance ratio tests, in conjunction with individual tests, lies in their independence assumption and reliance on asymptotic approximations for the statistics' sampling distribution.

The outcomes unveiled by this study unveil a notable absence of compelling evidence supporting adherence to the Random Walk Hypothesis within the stock indices of China, India, Indonesia, Malaysia, Pakistan, and the Philippines. These findings underscore the existence of intertemporal predictability in the stock markets of these emerging countries, a phenomenon primarily attributed to the shrewdness of investors. The Efficient Market Hypothesis, in addressing the risk premium investors attach to future stock prices, endeavors to capture risk-adjusted abnormal returns predicated on historical stock price data.

The existence of intertemporal predictability in these developing and emerging countries challenges the Random Walk Hypothesis and suggests two plausible factors. Firstly, as proposed by Abraham (2002), this situation may be attributed to the influence of thinly traded stocks from smaller listed firms in the market. Secondly, Hahm's study (2000) sheds light on this situation as a result of the pervasive effects of information asymmetry among market participants.

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