International Journal of Advances in Engineering and Management (IJAEM)
Volume 2, Issue 6, pp: 209-217 www.ijaem.net ISSN: 2395-5252

Assessing the Random Walk Hypothesis in Emerging Markets: Evidence from the Stock Exchange of Mauritius.

Tankeh Garvin Akwolaga,
Postgraduate Student, Gujarat University, Ahmedabad, India.

Date of Submission: 02-09-2020 Date of Acceptance: 19-09-2020

ABSTRACT: This study examines the random walk hypothesis on the prices of stocks listed on the Stock Exchange of Mauritius (SEM) using the daily values of three market indices, namely, the SEM-ASI, the SEMDEX, and the SEMTRI, from September 12, 2016, to March 12, 2020. Statistical tests includingthe Kolmogorov-Smirnov test, the Shapiro-Wilk test, the runs test, and the autocorrelation test are applied to the return series of the three indices over the study period.The Kolmogorov-Smirnov test, the Shapiro-Wilk test, and the values of skewness and kurtosis indicatethat price movements on the SEM are not normally distributed. They are negatively skewed and leptokurtic. The results of the runs test and the autocorrelation test show that successive price changes on the SEM are not independent. Price movements are not random. In conclusion, this studyfound strong evidence against the random walk hypothesis and the weak-form of efficient market hypothesis on the SEM. Hence, the Stock Exchange of Mauritius is weak-form inefficient.

KEYWORDS: Emerging markets, market efficiency, random walk hypothesis, SEM, weak-form efficiency.

I. INTRODUCTION

The concepts of efficient market hypothesis and random walk hypothesis have gained greater attention of researchers and other stakeholders in recent years. This is partly due to the growing quest to understand the dynamics of the world's securities markets, especially following disruptive events such as the 2008 global financial crisis, Brexit, and the COVID-19 pandemic. However, most of the studies on market efficiency are focused on the developed world. As a result, there is little empirical literature on the efficiency of emerging African stock markets. This is often due to the inadequacy, or even the unavailability, of data.

The beginning of the concept of efficient market hypothesis is often traced back to the start of the twentieth century, when a French mathematician called Louis Bachelier did his PhD dissertation on the topic "The Theory of Speculation" in 1900. Initially, the work of Louis Bachelier was overlooked. Around the middle of the 20th century, however, the celebrated economist Paul Samuelson circulated Bachelier's work. The English version of the work was subsequently published by Cootner in 1968 (Dimson & Mussavian, 1998). Some years afterwards, the random walk hypothesis and then the efficient market hypothesis were developed with inspiration from Bachelier's pioneering work.

The random walk hypothesis was developed by Kendall (1953). Kendall (1953) analyzed the weekly time series of twenty-two (22) stock market indices and reached the conclusion that the performance of the stock market cannot be predicted. The Random walk hypothesis is usually regarded as a component of the efficient market hypothesis. In fact, many researchers actually study the random walk hypothesis in order to determine whether the efficient market hypothesis holds for a given stock market. The random walk hypothesis states that movements in stock prices follow a random walk and, therefore, cannot be predicted. This is in line with the efficient market hypothesis, as developed by (Fama, 1970). Fama (1970, p. 383) argues that stock prices in an efficient market always "fully reflect all available information." That is, all stock prices reflect their intrinsic values. If stock prices do reflect all available information, there would not be over-valued or under-valued stocks. This forms the basis of the efficient market hypothesis.

Fama (1970) classified efficient market hypothesis into three forms. They are strong-form, semi-strong form and weak-form efficient market hypothesis. Strong- form efficient market hypothesis, highest form of market efficiency, states that security prices reflect all relevant public and private information. Thus, investors cannot beat the market by trading with any new piece of information, public or private. Next, the semi-strong form of efficiency posits that the prices of securities reflect public information. Lastly, weak-form of market efficiency states that security prices reflect only past volume and price information of securities. It is the lowest form of efficiency. Stock markets are often tested for weak-form of market efficiency using statistical tests such as runs test (Worthington and Higgs, 2003; Borges, 2010; Ayentimi, Mensah, & Naa-Idar, 2013; Phan & Zhou, 2014; Jakata, Hlupo, & Gondo, 2015), autocorrelation tests (Jakata, Hlupo, & Gondo, 2015; Phan & Zhou, 2014), variance ratio tests (Worthington and Higgs, 2003; Borges, 2010; Phan & Zhou, 2014). The remaining part of this section provides a review of extant literature on the random walk hypothesis and efficient market hypothesis, an overview of the SEM, and the indices of the SEM.

1.1 EMPIRICAL REVIEW

The concepts of random walk hypothesis and efficient market hypothesis have been studied in stock markets across the world. In studying the efficiency of the Nigerian stock market, Olowe (1999) performed correlation analysis on the monthly stock market returns spanning the period of January, 1981, to December, 1992. The findings indicate that the Nigerian stock market is efficient in the weak form. In a study of a group of some African and European stock markets, Omran and Farrar (2006) tested the random walk hypothesis in the stock markets of Egypt, Morocco, Jordan, Turkey, and Israel. The findings of the study reject the random walk hypothesis for all the five emerging markets studied. Furthermore, Chiwira and Muyambiri (2012) studied the Botswana Stock Exchange (BSE) for the existence of weak-form efficiency over the period of 2004-2008. Following the analysis of stock prices with unit root tests (the Augmented Dickey Fuller test and the Phillips-Perron test), the runs test, the autocorrelation test, among others, it was found that the Botswana Stock Exchange is weak-form inefficient. Ayentimi, Mensah, and Naa-Idar (2013) examined the weak-form efficiency of stocks listed on the Ghana Stock Exchange (GSE). Normality and non-parametric tests were used to analyze the weekly prices of listed stocks. It was found that stock returns do not follow a normal distribution and Ghana Stock Exchange is not weak-form efficient. Also, Njuguna (2016) investigated whether the Nairobi Securities Exchange (in Kenya) is weak-form efficient. After analyzing data covering the period 2001-2015 using unit root tests, the serial correlation test, and the runs test, Njuguna (2016) concluded that the Nairobi Securities Exchange is weak-form inefficient. Fowdar, Subadar, Lamport, Sannassee, and Fawzee (2016) assessed the market efficiency of the Stock Exchange of Mauritius (SEM). They performed analysis of daily market returns covering the period 1999 to 2004, using the Augmented Dickey-Fuller test, the KPSS test, the runs test, and autocorrelation tests. The test results show that the market returns do not follow a normal distribution and serial correlation is present in stock prices. In addition, the results of both the Augmented Dickey-Fuller test and the runs test provide evidence that the return series did not follow a random walk over the study period. Hence, the test results indicate that the Stock Exchange of Mauritius is not weak-form efficient.

Some research has been conducted on the efficiency of North and Latin American stock markets. Worthington and Higgs (2003) investigated the weak-form efficiency of the stock markets of Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela by applying unit root tests, multiple variance ratio tests and the runs test on daily returns of listed stocks. The study found that the sampled stock markets are not weak-form efficient. Additionally, Urrutia (2004) used variance ratio tests to examine the random walk hypothesis in Argentine, Brazilian, Chilean, and Mexican stock markets from December 1975 to March 1991. The findings indicate that stock price changes in all the markets do not follow a random walk. However, the runs test results suggest that the markets of Argentina, Brazil, Chile, and Mexico are weak-form efficient, in contrast with the findings of Worthington and Higgs (2003). Duarte-Duarte, Pérez-Iñigo, and Sierra-Suárez (2014) tested the weak-form efficiency of the Colombian stock market with data comprising values of General Index of the Stock Exchange of Colombia and prices of the most representative listed assets. It was concluded based on the results of the Jarque-Bera (JB) test, BDS test, the Barttlet test, the runs test, and the Ljung-Box (LB) test, that the Colombian stock market is weak-form inefficient for the entire period. Patel (2016) investigated the existence of the January effect in the United States and other international stock returns from January, 1997, to December, 2014. The study used daily index values of six Russel broad market indices. The results of the analysis do not provide evidence of the presence of the January effect in any of the sampled international stock markets.

Turning to the stock markets of Asia, Lasrado and Rao (2010) studied the weak-form efficiency of the Indian stock market. They applied unit root tests and the Durbin-Watson test for

International Journal of Advances in Engineering and Management (IJAEM)
Volume 2, Issue 6, pp: 209-217 www.ijaem.net ISSN: 2395-5252

autocorrelation to the returns of four stock market indices, starting from 1995 to 2005. The test results provide evidence that the Indian stock market is not weak-form efficient. In their study of the market efficiency of the Vietnamese stock market, Phan and Zhou (2014) applied the statistical tests including the runs test, the variance ratio test, and the autocorrelation test on the weekly values of the Vietnam stock index (VN-Index) and daily prices of select listed stocks over the first 13-year period of operation of the Vietnamese stock market ending 2013. There was no evidence in support of the random walk hypothesis. It was therefore concluded that the Vietnamese stock market is not efficient in the weak form. Awan and Subayyal (2016) tested the weak form of the efficient market hypothesis in the stock markets of six Gulf States, namely, Bahrain, Kuwait, Oman, Saudi Arabia, UAE and Qatar. They employed runs and autocorrelation tests in the analysis of data comprising the daily closing values of stock indices of the six stock markets covering the period 2011-2015. The results of the tests provide evidence that stock prices in the stock markets do not follow a random walk and reveal the existence of significant autocorrelation at different lags. Thus, it was concluded that the stock markets of Bahrain, Kuwait, Oman, Saudi Arabia, UAE and Qatar are not weak-form efficient. In another study on Asian stock markets, Hawaldar, Rohit, and Pinto (2017) used the Kolmogorov-Smirnov test, the autocorrelation test, and the runs test to test the weak form of market efficiency of the Bahrain Bourse over the period of 2011 to 2015. Hawaldar, et al. (2017) found that share price movements in general do not follow the random walk. However, they could not conclude on the weak form efficiency of the Bahrain Bourse due to the presence of low to moderate correlation between share price movements.

Several studies have also been performed on European stock markets. Smith and Ryoo (2003) examined the market efficiency of the stock markets of Greece, Hungary, Poland, Portugal, and Turkey using the variance ratio test. The findings of the study reject the random walk hypothesis in the stock markets of Greece, Hungary, Poland, and Portugal. Hence, with the exception of Turkey, the efficient market hypothesis is rejected for all the stock markets. Borges (2010) investigated the weak form of market efficiency in the stock markets of France, Germany, Greece, Portugal, Spain and the United Kingdom for the period of 1993-2007. Statistical techniques including runs test and joint variance ratio tests were used to analyze the daily and weekly data of stock indices of the European markets. All the return series are found not to be normally distributed. The efficient market hypothesis is rejected for the stock markets of France, Greece, Portugal, and the United Kingdom. However, the was no evidence to support the rejection of the hypothesis for the stock markets of Germany and Spain. Evidently, he findings for the stock market of Greece are in line with those of Smith and Ryoo (2003). In their research study, Tokić, Bolfek, and Peša (2018) investigated the existence of weak-form efficiency in the stock markets of developing Eastern European countries. The Augmented Dickey-Fuller test, the runs test, the serial correlation test, the test of January effect, and the variance ratio test were employed to analyze the daily returns data of the stock market indices of Croatia, Serbia, Slovenia, and Slovakia. The data covered the period of January 1, 2006, to December 31, 2016. The test results provide evidence that the stock markets of Croatia, Serbia, Slovenia, and Slovakia are weak-form efficient.

In conclusion, various studies document evidence on the random walk hypothesis and the efficient market hypothesis. However, the evidence still remains inconclusive. This study contributes evidence to the existing literature from the perspective of the emerging equity market of Mauritius.

1.2 OVERVIEW OF THE SEM

Mauritius is a high-income island nation of Africa, located in the Indian Ocean. Its main securities market is the Stock Exchange of Mauritius (SEM). On March 30, 1989, the SEM was incorporated in Mauritius under the Stock Exchange Act 1988 to run and promote a regulated securities market in the island nation. Its operations began in July 1989 with only five listed companies and a market capitalization of USD 70 million. It was later converted from a private limited company to a public company on October 06, 2008.

In the beginning, trading was done once a week under the Box Method, which was replaced by the Open Outcry System in September, 1991, to enhance transparency. In 2000, the capital structure of the SEM was demutualized. The SEM has been a member of the World Federation of Exchanges (WFE) since 2005. The Open Outcry System was, in turn, replaced by a fully automated and electronic stock market infrastructure in June 2001, making the SEM the first in Africa to do so. Trading on the SEM is done for 5.5 hours on a daily basis. Its settlement cycle is T+3. Later in 2011, the SEM became the only stock exchange in Africa to have a multi-currency platform. In a move that further increased the variety of listed

International Journal of Advances in Engineering and Management (IJAEM)
Volume 2, Issue 6, pp: 209-217 www.ijaem.net ISSN: 2395-5252

securities, the SEM became the first stock exchange to list a Masala Bond in 2016. With a market capitalization of more than USD 12 billion, the SEM has a ratio of capitalization to GDP ratio of over 90%. This ratio is the second highest in Africa after that of South Africa.

On average, local investors account for about fifty-five percent of the daily trading activities while foreign investors account for the remaining 45%. Also, institutional investors account for majority of the local trading activities (75%). Foreign investors enjoy a number of benefits. First, they can freely repatriate the proceeds of sale of their shares. Moreover, they are not required to pay withholding tax on dividend and capital gains tax, as of today. As a way of digitizing its investor services for Android and iOS users, the SEM launched the mySEM mobile app in 2018.

1.3 INDICES OF THE SEM

The indices of the SEM include the SEMDEX, the SEM-All Share Index (SEM-ASI), the SEM Volume Weighted Average Price Index (SEM-VWAP), and the SEM- Bond Index (SEM-BI), among others. Both the SEM-ASI and SEM-VWAP Index were introduced in September, 2016, as part of the internationalization efforts of the SEM. Even though only the SEM-ASI was introduced on September 12, 2016, as a new index, the composition of the SEMDEX and the SEMTRI (RS) were changed on the same day as well. This study focuses on the SEMDEX, the SEM-ASI, and the SEMTRI (RS).

The SEMDEX is a free-float capitalization-weighted index was introduced as an all-share index on July 05, 1989, with a base index value of 100. It was made up of all ordinary shares listed on the Official Market of the SEM, subject to the free-float requirements of the market. However, on September 12, 2016, its composition was modified, forming an index that tracks the price movements of all rupee-denominated companies on the Official Market.

Furthermore, the SEM-ASI is a free-float index which is made up of all shares of companies /Depository Receipts listed and traded on the Official Market. Its constituent securities are denominated in MUR, USD, GBP, EURO, ZAR and other foreign currencies. The value of the SEM-ASI on the day it was launched equaled the closing value of the SEMDEX on September 09, 2016. New companies were added to the SEM-ASI following some adjustments to the SEMDEX. This is because the SEMDEX failed to incorporate the contribution of Global Business Companies Category 1 (GBC 1) companies and foreign-currency denominated international companies listed on the SEM, thereby not reflecting a full picture of the market size and performance. Today, the SEM-ASI tracks the performance of all companies listed on the Official Market of the SEM.

The SEM- Total Return Index (SEMTRI) RS is an index that provides information on the total return of the constituents of the SEMDEX to domestic and foreign stakeholders of the SEM. It includes both price movements as well as dividend obtained from listed stocks since July 05, 1989, when the SEM commenced operations. Starting from September 12, 2016, the SEMTRI tracked only Rupee-denominated constituents to match the composition of the new SEMDEX.

II. METHODOLOGY

This study examines the random walk hypothesis for daily stock returns of the SEM from September 12, 2016, to March 12, 2020, using tests of normality, independence, and randomness, including the Kolmogorov-Smirnov test, the Shapiro-Wilk test, the runs test, and the autocorrelation test.

2.1 DATA AND RESEARCH APPROACH.

This research study adopts the quantitative research approach and employs secondary data. The data for this study comprises the daily values of three market indices of the SEM, namely, the SEMDEX, the SEM-ASI, and the SEMTRI, from September 12, 2016, to March 12, 2020. This data was obtained from the official website of the SEM.Then returns were computed from the daily values of each index using the formula below:

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

Where,
r_t is the return at time t, P_t is the price at time t, and P_{t-1} is the price at time t – 1.

After the review of relevant literature, the following hypothesis can be formulated.

H_0: The indices of the Stock Exchange of Mauritiusfollow a random walk.

H_1:The indices of the Stock Exchange of Mauritius do not follow a random walk.

2.2 NORMALITY TESTS

In this study, the values of skewness and kurtosis as well as the Kolmogorov-Smirnov (K-S) testand the Shapiro-Wilks test are used to examine the normality of the return series of the three market indices of the SEM.

Skewness and kurtosis are univariate statistical measures of normality. Skewness measures the symmetricity of the distribution of a return series around its mean value. The value of skewness of a normal distribution is zero (0). If skewness exceeds zero, then the distribution is said to be positively skewed (has a long right tail). On the other hand, if skewness is less than zero, then the distribution is negatively skewed (has a long-left tail).

On the other hand, kurtosis measures the peakedness or flatness of the distribution of a return series and the thickness of its tails. A normal distribution has a kurtosis value of three (3) and is said to be mesokurtic. A distribution with a kurtosis greater than 3 is said to be leptokurtic (or peaked relative to a normal distribution). Conversely, if the kurtosis is less than 3, the distribution is said to be platykurtic, or flat.

The Kolmogorov- Smirnov (K-S) test non-parametric test that used to examine the normality of a data set. It tests normality by standardizing and comparing each return series to the standard normal distribution. If the p-value of the K-S test is less than the level of significance of the test (5% in this case), reject the null hypothesis of normality. Otherwise, the distribution follows a normal distribution.

The Shapiro–Wilk test is another test of normality. It is generally considered to be more powerful than the Kolmogorov-Smirnov test.Its rules for accepting or rejecting the null hypothesis are similar to those of the Kolmogorov-Smirnov test. If the p-value of the Shapiro–Wilk test is less than the level of significance, reject the null hypothesis that the distribution is normal.

2.3 RUNS TEST

The runs testis a non-parametric test used to test the randomness of a sequence of increasing or decreasing data values. In this study, the runs test is used to investigate whether the sequence of consecutive price changes on the SEM are independent or not, using the returns of the three indices.It examines the following hypothesis.

H_0 : The sequence of returns is random.

H_1 : The sequence of returns is not random.

The test statistic of the runs test, Z, is computed as follows:

$$Z = \frac{R - \bar{R}}{S_R}$$

Where, $\bar{R} = \frac{2N_1N_2}{N} + 1$,

$S_R = \sqrt{\frac{2N_1N_2\,(2N_1N - N_1 - N_2)}{(N\,)^2(N-1\,)}}$, $N_1 =$ Number of positive residuals, $N_2 =$ Number of positive residuals, and $N =$ Total number of observations.

Based on the results of the analysis, reject the null hypothesis if the absolute value of the test statistic (|Z|) is greater than the critical value at the given level of significance. Otherwise, retain the null hypothesis of randomness.

2.4 AUTOCORRELATION TEST

Autocorrelation tests are used to measure the correlation between returns at time t and returns at time t-k. By this, it can be ascertained as to whether or not each return series follows a random walk. In other words, autocorrelation test is used to test for independence of successive stock prices, just like the runs test. However, unlike the runs test, the autocorrelation test is parametric. As Jakata, et al., (2015) noted, non-parametric tests are usually less powerful than parametric tests under the condition of normality. If the serial correlation coefficients are significantly different from zero, then there is autocorrelation. The autocorrelation test statistic, ρ_k, is given as:

$$\rho_k = \frac{\sum_{t=1}^{N-k}(R_t - \bar{R})(R_{t-k} - \bar{R})}{\sum_{t=1}^{N}(R_t - \bar{R})^2}$$

Where,

ρ_k is the serial correlation coefficient of lag k, N is the number of observations,k is the lag length, R_t is the return of the index at time t, and $\bar{R}$ is the sample mean of the index returns.

The presence of autocorrelation indicates that the returns and, by extension, stock prices are dependent and thereby predictable. Thus, the weak-form efficient market hypothesis should be rejected.

III. RESULTS

Below are the results of the tests of normality and independence/randomness obtained from the data analysis using the SPSS statistical software.

3.1 NORMALITY TESTS

Table 3.1.1: Results of Descriptive Statistics

Descriptive Statistics				
		SEM_ASI	SEMDEX	SEMTRI
N	Valid	866	866	866
	Missing	0	0	0
Mean		2.5E-7	.00005015	.00017193
Std. Deviation		.004631174	.004782447	.004763287
Skewness		-3.342	-7.346	-7.481
Std. Error of Skewness		.083	.083	.083
Kurtosis		48.805	118.630	121.343
Std. Error of Kurtosis		.166	.166	.166

Table 3.1.1 provides the descriptive statistics of the returns of the three SEM indices. The skewness values of the SEM-ASI, the SEMDEX, and the SEMTRI are -3.342, -7.346, and -7.481 respectively. All of them are less than zero, indicating that the returns on the SEM-ASI, the SEMDEX, and the SEMTRI, are negatively skewed and not normally distributed. Furthermore, Table 3.1.1 gives a kurtosis value of 48.805 for SEM-ASI returns, 118.630 for SEMDEX returns, and 121.343 for SEMTRI returns. All the kurtosis values are greater than 3 so the distribution of each of the three indices is leptokurtic, or peaked comparative to the normal. In sum, the skewness and kurtosis values indicate that returns on the three indices do not follow a normal distribution. Next are the results of theKolmogorov-Smirnov and the Shapiro-Wilk test.

Table 3.1.2: The results of the Kolmogorov-Smirnov and Shapiro-Wilk tests

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
SEM_ASI	.194	866	.000	.606	866	.000
SEMDEX	.187	866	.000	.546	866	.000
SEMTRI	.187	866	.000	.538	866	.000
a. Lilliefors Significance Correction						

From Table 3.1.2 above, the Kolmogorov-Smirnov test results shows that the SEM-ASI, the SEMDEX, and the SEMTRI each has a p-value of 0.00, which is less than the level of significance of 0.05.Hence, none of the three indices follows a normal distribution according to the Kolmogorov-Smirnov test results. Similarly, the p-values of the Shapiro-Wilk test for each index is less than 0.05, which is an indication of non-normality. Thus, both the Kolmogorov-Smirnov test and the Shapiro-Wilk test reject the null hypothesis of normality.

3.2 INDEPENDENCE

This section provides the results of the tests of independence, namely, the runs test and the autocorrelation test.The results of the runs test are as follows.

Table 3.2.1: Results of the Runs Test

Index	**Null Hypothesis**	**Sig.**	**Decision**
SEM-ASI	The sequence of values defined by SEM_ASIis random.	0.034	Reject the null hypothesis
SEMDEX	The sequence of values defined by SEMDEX is random.	0.000	Reject the null hypothesis
SEMTRI	The sequence of values defined by SEMTRI is random.	0.000	Reject the null hypothesis

Asymptotic significances are displayed. The significance level is 0.05.

Table 3.2.1 shows that the p-value of the return series of the SEM-ASI, SEMDEX, and SEMTRI are 0.034, 0.000, and 0.000 correspondingly. Since all the p-values are less than the level of significance of 0.05, the null hypothesis of randomness is rejected for all the indices. This implies that, the all returns and, by extension stock prices, are not random.Thus, the runs test provides strong evidence to reject the random walk hypothesisin price movements of stocks listed on the SEM.

Next are the results of the autocorrelation test.The diagrams below show the autocorrelation plots of the return series of the SEM-ASI, the SEMDEX, and the SEMTRI at 5 lags.

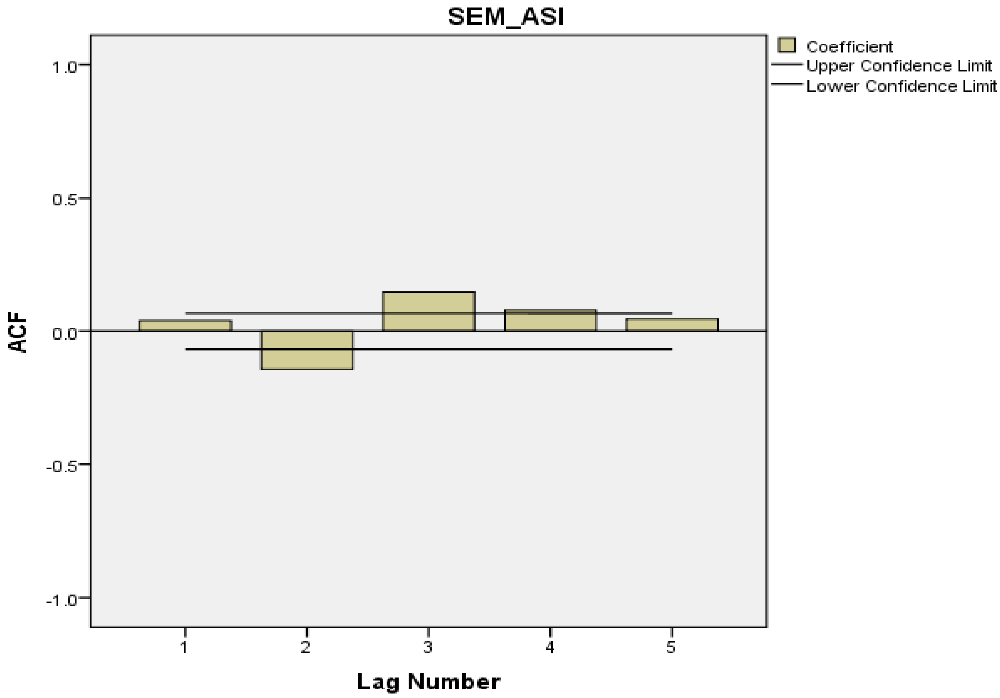

Figure 3.2.1: Autocorrelation Plot of SEM-ASI

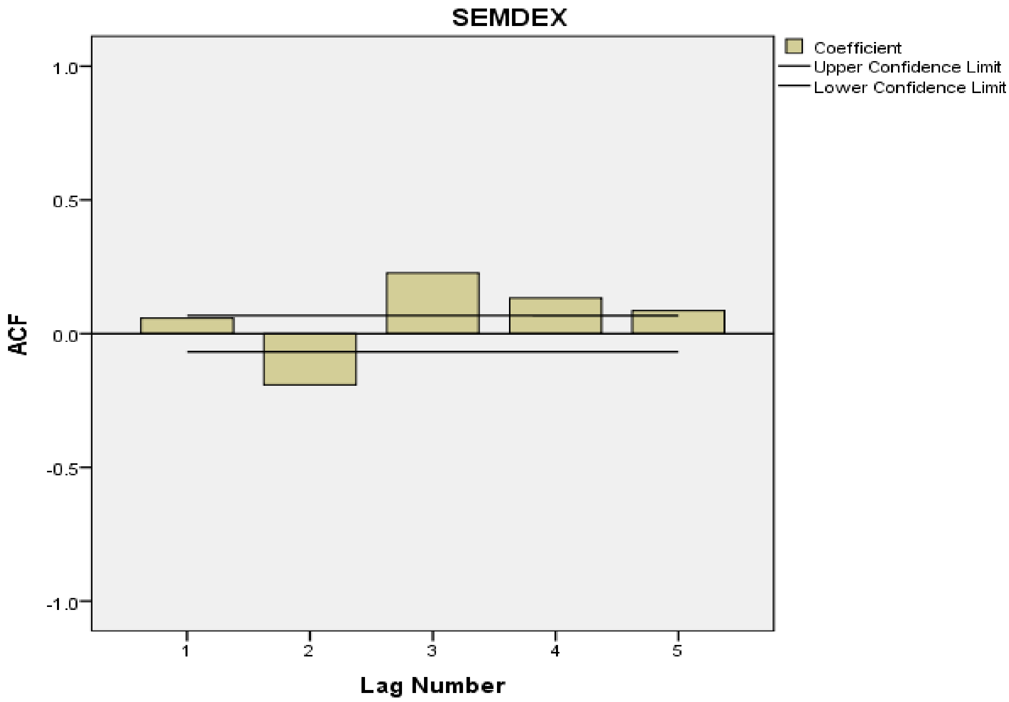

Figure 3.2.2: Autocorrelation Plot of SEMDEX

International Journal of Advances in Engineering and Management (IJAEM)
Volume 2, Issue 6, pp: 209-217 www.ijaem.net ISSN: 2395-5252

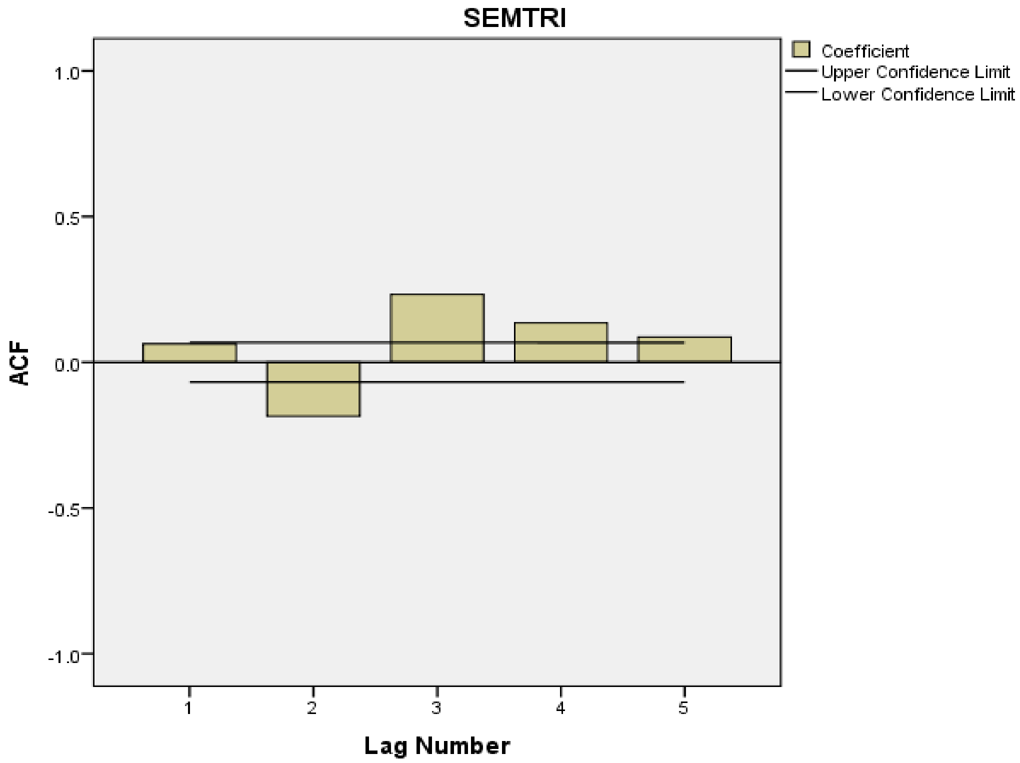

Figure 3.2.3: Autocorrelation Plot of SEMTRI

From the autocorrelation plots displayed above, all the three indices record significant levels of autocorrelation over the study period. This indicates that returns of the indices, and thus stock prices, are not independent. Hence, the random walk hypothesis is rejected by the autocorrelation test and, therefore, the SEM is said to be inefficient in the weak form. document

IV. CONCLUSION

This study seeks to examine the random walk hypothesis and weak-form efficiency of the Stock Exchange of Mauritius (SEM) by applying statistical tests of normality and independence on the daily returns of three market indices, the SEM-ASI, the SEMDEX, and the SEMTRI, from September 12, 2016, to March 12, 2020. Following the analysis of the data, it is revealed that the distributions of the SEM-ASI, the SEMDEX, and the SEMTRI are all negatively skewed and leptokurtic over the study period.Moreover, both the Kolmogorov-Smirnov test and the Shapiro-Wilk test give a p-value that is less than 0.05, hence the null hypothesis of normality is rejected.

With regard to the tests of independence and randomness, the runs test results indicate that the SEM-ASI, the SEMDEX, and the SEMTRI have statistically significant p-values. Thus, all the indices do not follow a random walk. This suggests that future stock prices can be predicted based on past price information.Similarly, the autocorrelation test shows that the extent of autocorrelation of all the three indices is significant, indicating that there is no independence in successive price changes on the SEM.

Based the aforementioned findings, there is strong evidence that the random walk hypothesis and the weakform of theefficient market hypothesis do not hold for the SEM over the study period. Hence, the Stock Market of Mauritius (SEM) is not efficient in the weak form. This is consistent with the findings of Fowdar, et al., (2016).The findingssuggest that investors can develop investment strategies to make above-average returns on the SEM.

The researcher recommends that stakeholders implement measures and create market conditions that reduce transaction costs on the SEM to boost market activity and efficiency. Additionally, market regulators should adopt policies and regulations that attract new companies for listing and increase disclosure by listed entities. Also, further research is recommended into the impact of the Covid-19 pandemic on market efficiency.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 2, Issue 6, pp: 209-217 www.ijaem.net ISSN: 2395-5252

REFERENCES

[1]. Abrosimova, N., & et al. (2002). Testing weak-form efficiency of the Russian stock market. EFA 2002 Berlin Meetings Presented Paper.

[2]. Awan, U., & Subayyal , M. (2016). Weak form efficient market hypothesis study: Evidence from Gulf stock markets. Retrieved from http://dx.doi.org/10.2139/ssrn.2787816

[3]. Ayentimi, D., Mensah, A., & Naa-Idar, F. (2013). Stock market efficiency of Ghana Stock Exchange: An objective analysis. International Journal of Management, Economics and Social Sciences, 2(2), 54-75.

[4]. Borges, M. (2010). Efficient market hypothesis in European stock markets. The European Journal of Finance, 16(7), 16(7), 711-726. doi: 10.1080/1351847X.2010.495477

[5]. Chiwira, O., & Muyambiri, B. (2012). A test of weak form efficiency for the Botswana Stock Exchange (2004-2008). British Journal of Economics, Management & Trade, 2(2), 83-91.

[6]. Dimson, E., & Mussavian, M. (1998). A brief history of market efficiency. European Financial Management, 4(1), 91-193.

[7]. Duarte-Duarte, J., Pérez-Iñigo, J., & Sierra-Suárez, K. (2014). Testing the efficiency market hypothesis for the Colombian stock market. DYNA, 81(185), 100-106.

[8]. Fama, E. (1970). Efficient capital markets: A review of theory and empirical work. Journal of Finance, 25.

[9]. Fowdar, S., Subadar, U., Lamport, M., Sannassee, R., & Fawzee, M. (2016). Assessing the level of efficiency of the Stock Exchange of Mauritius. University of Mauritius Research Journal, 13.

[10]. Hawaldar, I., Rohit, B., & Pinto, P. (2017). Testing of wea form of efficient market hypothesis: Evidence from the Bahrain Bourse. Investment Management and Financial Innovations, 14(2).

[11]. Jakata, O., Hlupo, P., & Gondo, C. (2015). Random walk hypothesis: Evidence from market efficiency of the Zimbabwe Stock Exchange. International Journal of Science and Research, 4(9), 1460-1475.

[12]. Kendall, M. (1953). The analysis of economic time series. Journal of Royal Statistical Association, 11-25.

[13]. Lasrado , C., & Rao , T. (2010). Informational efficiency of Indian capital market: A study on stock market indices for the period 1995-96 to 2004-05. Bhavan's International Journal of Business, 4(1).

[14]. Njuguna, J. (2016). Testing the efficient market hypothesis on the Nairobi Securities Exchange. Investment Management and Financial Innovations, 13(3), 75-83.

[15]. Olowe, R. (1999). Weak form efficiency of the Nigerian Stock Market: Further evidence. African Development Review, 11(1), 54 – 68.

[16]. Omran, M., & Farrar, S. (2006). Tests of weak form efficiency in the Middle East emerging markets. Studies in Economics and Finance, 23(1), 13-26.

[17]. Patel, J. (2016). The January Effect anomaly reexamined In stock returns. The Journal of Applied Business Research, 32(1).

[18]. Phan, K., & Zhou, J. (2014). Market efficiency in emerging stock markets: A case study of the Vietnamese stock market. IOSR Journal of Business and Management, 16(4).

[19]. Smith, G., & Ryoo, H. (2003). Variance ratio tests of the random walk hypothesis for European emerging stock markets. The European Journal of Finance, 9(3), 290-300.

[20]. Stock Market of Mauritius. (2020). Retrieved from Stock Market of Mauritius: https://www.stockexchangeofmauritius.com/

[21]. Tokić, S., Bolfek, B., & Peša, A. (2018). Testing efficient market hypothesis in developing Eastern European countries. Investment Management and Financial Innovations, 15(2), 281-291.

[22]. Urrutia, J. (2004). Tests of random walk and market efficiency for Latin American emerging equity markets. Journal of Financial Research, 18, 299-309.

[23]. Worthington, A., & Higgs, H. (2003). Tests of random walks and market efficiency in Latin American stock markets: An empirical note. Retrieved from ResearchGate: https://www.researchgate.net/publication/27463068_Tests_of_random_walks_and_market_efficiency_in_Latin_American_stock_markets_An_empirical_note_Discussion_Paper_No_157