

## Study the Efficiency Hypothesis in the Egyptian Stock Market

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### ABSTRACT

This article aims to verify if the Egyptian stock market has information efficiency (market efficiency assumptions) by studying the presence of time series properties for daily stock returns between 2005 and 2015. Parametric and non-parametric tests are used to achieve this purpose, such as ADF/PP unit root- RUNS TEST- Perron - run test. The Jarque– Bera test was used to measure the moderation of returns; the GARCH model and ARCH model are used also. The results referring to the Egyptian stock market follow the inefficient form, and the prices are closer to random traffic standards, showing that the price changes are random. Thus, there may be shares presented at less than their real value. Additionally, the consequence of the inefficiency of the Egyptian stock market on the weak level, given that the prices of stock prices do not reflect all historical information, it is possible for market participants to achieve unusual returns by using historical prices of shares.

**Keywords:** Relevant information, Risk market, Rational investor

**JEL Classifications:** G40,G14

### 1. INTRODUCTION

The efficiency of financial markets is considered one of the most important financing policies. The expression efficiency can be used to characterize the way in which resources are assigned in the market. Therefore, efficient allocation of resources is done well when employed in productive uses; efficiency can also describe the way in which markets operate, so the market that it works efficiently for is the market in which trading occurs quickly and cheaply. Information efficiency in financial markets refers to the rapid spread of information in the market and is reflected quickly by changes in market prices with the arrival of new information and the assumption that says a price in the financial market responds quickly to new information, called the efficient market hypothesis. Thus, the efficient market can be defined as a market in which prices reflect all relevant information and that no one that can beat the market, so there is no opportunity for profit (Kharbanda and Singh, 2018).

There are three types of market efficiency in the seminal work of Fama (1991) according to the effect of earnings on information,

such as stock prices. First is the weak form efficient; if the present stock prices totally reflect each of related information in previous trading archives, sequential stock returns are separate of each other and do not contain information that enables the investor to achieve extraordinary returns by evolving rules. Trading depends on historical models of stock returns only. Therefore, investors who buy stocks or shareholders focus on pursuing their strategy on market risk and returns characteristics, according to the diversification in the portfolio, preferring that. The second type of market efficiency is a semi-strong form that predicts how present prices are quickly adjusting to incorporate all overtly ready information, including past prices, returns, and other elements related to the company or published country accounts. The third type is the efficient market, which confirms that all current prices reflect private and available information. Subsequently in the strong form of market efficiency Securities are not priced at less or more than their value, and net returns that differ from the predictable risk are not offered. It is in efficient stock markets that the pricing techniques is able to confirm that the funds are transferred from savers to investment projects that achieve high

profits with a lower cost associated with improving economic growth (Nwachukwu and Shitta, 2015).

The monetary information of each company is important when evaluating the rate of share prices. The investor takes into account general financial information when assessing the expected future for any company. The returns are a measure of the profits or losses of the company through business activities, and they represent stock markets as a measure of the performance of companies. Both time and information on announcements of returns is used by financial markets to estimate the profitability and financial strengths of any company. New information is naturally unpredictable, which can be reflected in the share price before the announcement (Syed and Bajwa, 2018).

The aim of this article is to test the information efficiency in the Egyptian market with a focus on the weak efficient form by studying the random movement of stock price behavior in companies listed in an index in the Egyptian trading market. The assumptions that were tested in this article are whether the market is efficient and if the prices follow a random movement.

## 2. LITERATURE REVIEW

In this part of the article, the market efficiency assumptions are clarified by studying three kinds of market efficiency, which are the weak efficient form, the semi –strong efficient form. previous studies used several measurements of efficiency market including historical prices, closing prices, extra ordinary return, weakly return. The researcher also used various techniques, such as Augmented Dickey fuller, Unit root test, Phillips Perron, Run test, Garch and Arch model, Regression model.

Pradhan and Narasimhan (2002) studied the behavior of the stock price index in Andian from 1990 to 2001 and conducted various tests to measure the efficiency of the market. They concluded that efficiency increases over time and that these markets represent the weak efficient form, so we cannot reject the imposition of nothingness and the lack of randomness. The same point of view was supported by Jarrett (2008), Chigozie (2009), Jarrett (2010), Jain et al. (2013), Abakah et al. (2018).

Jarrett (2008) studied the efficiency of the capital market in Hong Kong, the third largest stock exchange in the Pacific region in Asia. There are predictable characteristics of the time series of stock prices traded in organized markets. The results show that

- The evidence indicates that the weak form of the effective markets hypothesis does not distinguish the trading market.
- The presence of daily and monthly temporal components is evident in the closing prices, price indices, and returns to securities. When these characteristics are in the closing prices, then it is possible to predict patterns; thus, investors can advantage from this information.
- The weak form of the hypothesis of financial markets is a question when the investor must make decisions related to investing in securities in the stock market. The daily variance is not random, so daily patterns can be predicted with a degree of accuracy.

Chigozie (2009) studied the weak efficient form in the Nigerian stock exchange by applying the GARCH model and found that the stock market in Nigeria follows a random movement and that it is a weak market in terms of efficiency. The evaluation is either less or more than the value of the share, which is a basic rule in these markets.

Jarrett (2010) studied the characteristics of the time series of daily stock returns in the Pacific financial markets using the following statistical methods: ordinary least squares-cross sectional regressions. The aim is to study the efficiency of markets and focus on the weak form as well as to analyze daily changes in financial market data. The results indicate that the time series of securities trading prices can be predicted in the systematic markets in Singapore, Malaysia, Korea, and Indonesia and that the ineffective form test extensively examines the trading rules available to common investors. The results showed that those who adhere to the random walk theory consider it wrong to search for corporate stocks that are undervalued or predict future price movements or returns with respect to the same securities, as they say it is unlikely that these events can be predicted and that all investors can do this to accept assumptions regarding the efficiency of financial markets.

Jain et al. (2013) studied the weak efficient form in the financial markets of India through the global financial crisis, which follows the random movement by obtaining the daily closing prices of shares from April 2005 to March 2010 and the source of data from the stock market sector in NSE, BSE using parametric (Augmented Dickey-Fuller-Unit root test) and non-parametric (Phillips Perron-Unit Root – Run test) methods, they concluded that

- Anden's stock exchange is efficient in its weak form through the economic stagnancy, meaning that investors must not be qualified for continuously achieve extraordinary returns by analyzing historical returns.
- The study also shows that all the stocks in these chosen indicators are considered powerful in their foundation, and these prices are not greatly affected by previous prices, other appropriate elements that come from the industry, or other information available to the public; therefore, we can deduce that the stock market exchange in Andina was media-efficient and no investor can simply grab any substantial information to achieve extraordinary returns (Jain et al., 2013).

Abakah et al. (2018) explained the weak form of efficiency in five stock markets in Africa (South Africa, Nigeria, Egypt, Ghana, and Mauritius) using various tests to evaluate the non-linear impact available in African markets on market efficiency. Weekly returns were used for return indicators S&P/IFC for five African countries from 2000 to 2013 using the unit root test, and as a result of the lack of non-linearity in the data for the stock price chain, random movement hypotheses were tested for five markets, and the regression model was used. The results indicate that:

- Nonlinear fourier unit root test failed to refuse the RWH for South Africa, Nigeria and Egypt.
- These markets follow the weak format as well as the random movement while Ghana and Mauritius follow the weak, inefficient form.

- By evaluating the non-linear model without making an adjustment to thin trading, the rich and South African markets follow the inefficient form while Nigeria, Egypt, and Mauritius do not.

Additionally, Syed and Bajwa (2018) studied the stock market's response to announcing the quarterly returns by conducting a study of the event and the efficiency of the market in the Saudi market for stock exchange. The market model was applied as a measure of expected returns and illustrated the unusual returns around the day of the event, and the results show that

- The Saudi stock market does not bear the average shape of semi-strong efficiency, and the efficiency of the Saudi market is also reflected by having evidence of the significance of the extraordinary returns and the announcement of past returns on the dates of the announcement.
- Investors closely watch for the announcement of returns and the movement of stock prices around the dates of the announcement, and Saudi Arabia has opened its doors to large foreign investors who seek to enter the Saudi money market and after entering them, the attitude of shares will differ.
- Semi-strong efficiency cannot be applied in the Saudi market.
- The study suggests that bad news causes more interaction in the market with strong efficiency compared to good news in general on the day of the announcement.

Hatemi and Morgen (2009) supported this result. They tested the market efficiency hypothesis in the Australian stock market using robust methods which are not sensitive to data. Their study includes two sources of important information in open markets, which is the interest rate of shares and exchange rates for shares, using daily data from 1994 to 2006. They studied the weak, efficient and semi-strong form. The weak, efficient form was tested by unit root testing in the stock price index. Using unit root denotes that the index prices follow the random distribution. This is a sacrifice that price variations are random, so it would be nonessential to use technical analysis in the study for patterns in the index of prices in the hope of trading profit. The semi-strong and efficient form was implemented through; therefore, the information available to the public consists of interest rates and exchange rates. As such, variables in the standard economy can be used to predict the movements of the index, and this is the first step in proving the assumptions of the semi-efficient form and the second step shows that such information can be used to achieve profitable trade after taking into account transaction costs. A highly efficient form was not tested because internal information was not available.

There are other studies that have examined whether the market is efficient or inefficient and Varamini and Svetlana (2008) main objective of their study is to use a specific percentage to test their hypothesis, which is that the investor is likely to overcome by testing investment funds that are based on market capitalization or the type of investment and also to find large, medium, and small investment funds from 1994 to 2007, which are divided into sub-periods from 1994 to 1999 and from 2000 to 2007. The results indicate that the market of investment funds is not always efficient, which makes it a potential market for the investor and

for the manager of the investment fund to achieve additional returns in the event of a modified risk. Varamini and Svetlana (2008) concluded that when market efficiency assumptions are spent investors cannot overcome the market because stock prices reflect all the appropriate information. A major number of rational investors pit with each other and try to expect future prices for individual securities and important information available to each of them. This competition will have a total impact on new information on the real values which are to be immediately reflected in the present prices, which according to these assumptions cannot outperform the market.

Similarly, Nwachukwu and Shitta (2015) focused on the inefficient form in 24 emerging markets and 9 industrial markets for the stock index around the world. This test predicts seasonal patterns of rates of return from January 2000 to December 2010. The descriptive statistics method was used to estimate the percentage of monthly returns, through the use of parametric and non-parametric methods, to test the behavior of unusual returns in stock markets. He concluded that

- Emerging economies that continue under a market with reforms achieve high returns associated with high risk, which in turn leads to attracting such markets to diversify the risks.
- Successive changes in stock prices are interlinked, so they include information on forecasting future prices in two-thirds of emerging markets compared to one-third in industrial markets.
- The beginning of the calendar year had an impact on half of the emerging markets and a quarter of the developing countries.
- Describing the characteristics of the sample shows that the expected shares listed in emerging markets have a high average arithmetic and standard deviation of their returns compared to the industrial markets. The Latin and American exchange market achieve high average returns with a high volatility, and the rate of returns per unit of risk indicates that Chile is the best of the emerging markets.
- When the market is not efficient, investors may make profits from the market.

Ren and Ren (2017) applied accurate forecasting to measure market efficiency hypotheses through use of mean absolute deviation-moving average methods-normal time series. The following are conclusions from the study:

- The market is incompetent, and the results are based on simulations of Fama from 1965 to 1970.

Conversely, Jiang (2017) provided evidence that the efficiency of the market varies greatly between individual stock and across the world's stock exchanges. Three approaches were tested in the study: partial modification, Dimson beta model, and a variance ratio test. This applies to the United States of America, and the results indicate that

- Stock prices are closer to the random flow criteria for stocks that enjoy liquidity, frequent trading, large fluctuation in return, and high prices (large market capitalization and small volume).
- Liquidity stimulates activity of Arbitrage, which in turn improves market efficiency.

- Market efficiency also varies with the information environment, as high-trading stocks based on information show a higher level of market efficiency, as the New York Stock Exchange achieved a higher level of efficiency compared to the stock exchange.

### 3. METHOD

In this research, secondary data that depends on scientific references and periodicals will be used to find out about the private scientific heritage, which is represented by one type of data: the stock closing price.

#### 3.1. Research Community and Study Sample

The research community is represented by all companies that have shares traded on the stock exchange. The study sample is represented by 30 companies listed on the stock market exchange, which are listed in the EGX30 index, and the data for these companies are analyzed from 2005 to 2015, which is the time during which data for companies are available.

To obtain a stable time series, the general index of the Egyptian stock market, EGX30, was converted into a series of monthly returns. To find the rate of change in the closing price index in the Egyptian market, the following formula was used:

$$R_t = \text{Log}(P_t/P_{t-1})$$

where  $P_t$  and  $P_{t-1}$  refer to stock index price at time  $t$  and  $t-1$  subsequently, the measurable hypotheses can be formulated as follows:

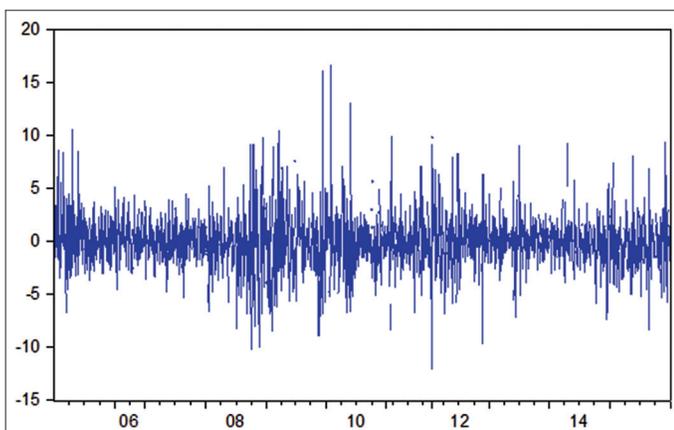
$H_1$ : The Egyptian stock market is an inefficient market.

### 4. RESULTS

#### 4.1. Converting the Time Series of the General Index of the Egyptian Market into a Stable Return Series

Figure 1 shows the extreme volatility in the series of daily returns for the closing prices of the general index of the Egyptian stock market, EGX30, and its exposure to systematic risks.

**Figure 1:** Series of daily returns for the general index of the stock market



#### 4.2. Jarque-Bera Test Measures the Moderation of the Daily Returns Distribution for the General Index

Using the Jarque-Bera test, Figure 2 shows that the series of daily returns for the general index of the stock market in Egypt, EGX30, is not moderate at a level of significance  $<0.001$ , which indicates that the distribution of those monthly returns is relaxed, and that changes in prices of stocks do not follow the random walk model in a way that supports the stock market inefficiency on the weak level; therefore, the price trend can be used to expect future movements or prices.

#### 4.3. Results of the Self-correlation and Partial Self-correlation Test for the Series of Daily Returns for the General Index

It is illustrate from Table 1 that there is a hierarchical correlation in the series of daily returns for the Egyptian Stock Exchange index, EGX30, in all displacements, which is a function at a level of significance  $<0.001$ , and then refused to impose the lack in a manner that supports the inefficiency of the stock market Egyptian at the weak level. It is also clear that the series of monthly returns does not go randomly and are self-linked.

#### 4.4. Results of the Unit Root Test for the Daily Returns of the Stock Market Index

It is clear from Table 2 that the calculated value is greater than the critical values for the statistics of the ADF test and the PP test at a lower level of significance (0.05), and then refused to impose the non-existence of the unit root, which indicates that the daily returns chain of the general index of the stock market in Egypt will be EGX30 according to the case of a fixed limit only, and then avoid obtaining false estimates of the model in question to support the inefficiency of the Egyptian stock market in relation to the weak level, rejecting the zero hypothesis of the random functioning of the monthly returns series of the general index.

#### 4.5. Results of the Contrast Ratio Test for the Daily Returns of the General Index of the Stock Market

It is clear from Table 3 that the calculated value of the Z-Statistic is indicative at a level of significance less than 0.001 and then refuses to impose the lack that the series of daily returns for the stock market index track random walk ( $H_0$ :  $VR [q] = 1$ ). Since the ratio of variance is statistically different from the correct one for all slowdowns, i.e.  $<1$  ( $VR$ ) ( $q$ ), the series of daily returns will be negatively related, supporting the inefficiency of the Egyptian stock market at the weak level.

#### 4.6. Results of Random Test Daily Returns of the General Index of the Stock Market

The randomness of daily returns was tested using RUNS TEST, as the calculated value of the test statistic ( $Z = 2.572$ ), which is a function at a level of significance less than 0.001, and then refused to impose the lack of randomness to distribute the daily returns to the general index of the stock market EGX30. The consequence of the inefficiency of the Egyptian stock market on the weak level, given that the prices of stock prices do not reflect all historical information, it is possible for market participants to achieve unusual returns by using historical prices of shares.

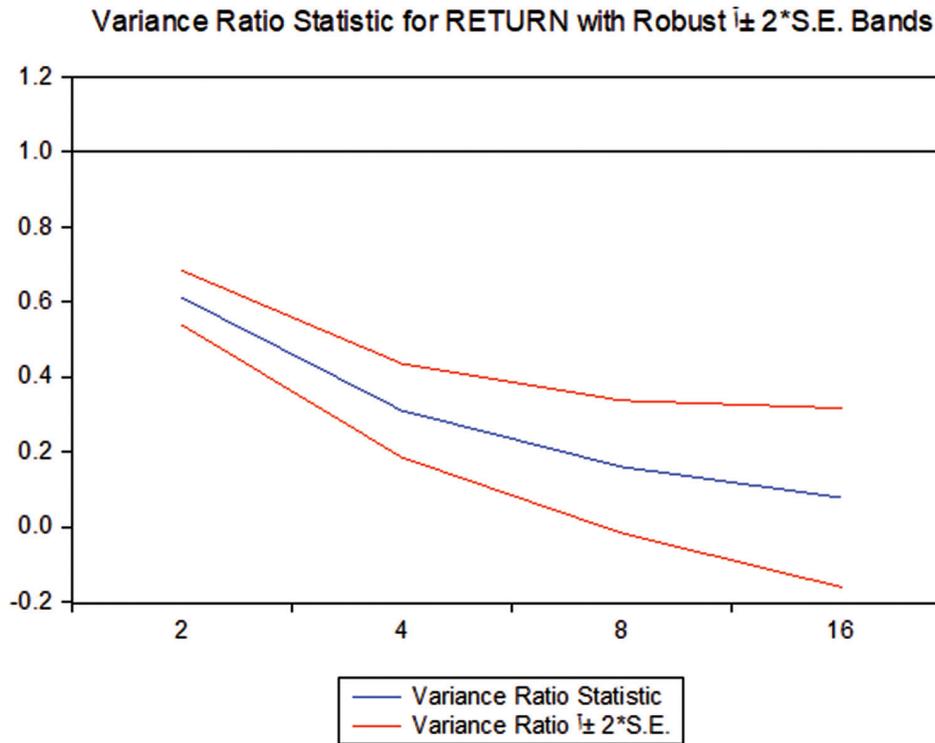


Figure 2: The hierarchical index of the general index of the stock market in Egypt

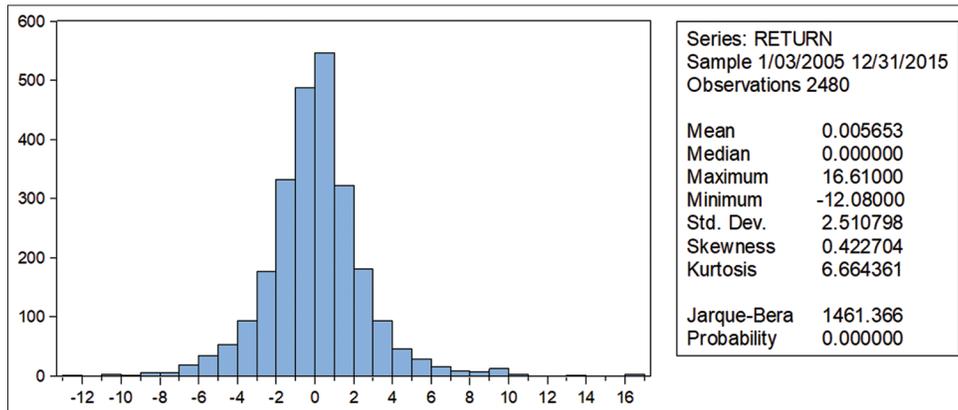


Table 1: Ljung-Box shows test values for self-correlation and partial self-correlation

LAG	AC	PAC	Q-stat.	Sig.	LAG	AC	PAC	Q-stat.	Sig.
1	0.195	0.195	94.457	0	19	0.031	0.038	119.86	0
2	0.016	-0.023	95.066	0	20	0.041	0.024	124.14	0
3	0.026	0.028	96.686	0	21	0.006	-0.011	124.24	0
4	0.001	-0.01	96.687	0	22	0.025	0.023	125.84	0
5	0.009	0.011	96.871	0	23	-0.012	-0.024	126.23	0
6	-0.019	-0.025	97.782	0	24	-0.008	0	126.38	0
7	-0.059	-0.052	106.46	0	25	-0.015	-0.016	126.95	0
8	-0.03	-0.009	108.72	0	26	0.001	0.012	126.96	0
9	-0.004	0.004	108.77	0	27	0.021	0.022	128.04	0
10	0.013	0.016	109.2	0	28	0.008	0.001	128.2	0
11	0.014	0.009	109.67	0	29	0.001	0	128.21	0
12	0.007	0.004	109.79	0	30	0.006	0.003	128.31	0
13	-0.039	-0.045	113.53	0	31	-0.043	-0.052	133.02	0
14	-0.031	-0.019	115.87	0	32	-0.015	0.001	133.62	0
15	-0.02	-0.015	116.91	0	33	0.032	0.04	136.19	0
16	-0.005	0.003	116.98	0	34	-0.032	-0.041	138.84	0
17	-0.002	0.001	116.98	0	35	-0.031	-0.011	141.22	0
18	-0.015	-0.011	117.53	0	36	-0.005	0.003	141.28	0

**Table 2: Test results of Augmented Dickey-Fuller and Philips-Perron**

Test results (PP)		Test results (ADF)	
The indicator	The general index	The indicator	The general index
Calculated value	-40.85764***	Calculated value	-40.85764***
Significant value	0.000	Significant value	0.000
Critical value at 1%	-3.432794	Critical value at 1%	-3.432794
Statistical decision	$H_0$ rejected	Statistical decision	$H_0$ rejected

A function at the level of significance less than 0.05\*

**Table 3: Test the contrast ratio for the daily returns of the general index of the stock market**

Joint Tests	Value	df	Probability	
Max  z  (at period 4)*	13.58020	598	0.0000	
Individual Tests				
Period	Var. ratio	Std. error	z-Statistic	Probability
2	0.596699	0.031680	-12.73056	0.0000
4	0.304421	0.051220	-13.58020	0.0000
8	0.166813	0.070429	-11.83012	0.0000
16	0.081393	0.096871	-9.482835	0.0000

**Table 4: GARCH (1) model according to normal distribution**

Variable	Coefficient	Std. error	Z-statistic	Prob.
Variance equation				
C	0.327000	0.043064	7.593272	0.0000
RESID (-1)^2	0.168040	0.013174	12.75524	0.0000
GARCH (-1)	0.788756	0.014879	53.00991	0.0000
AIC=4.482716 SC=4.489752HQ=4.485272 ARCH-LM=0.878928 SIG=0.3486				
GARCH=0.327000343663+0.168039796269*RESID(-1)^2+0.7887 55926342*GARCH(-1)				

Based on the previous six tests for Jarque-Bera, self-correlation, unit root, contrast ratio, randomness, and daily returns to the general index of the stock market, GARCH (1), it can be concluded that the Egyptian stock market is an inefficient market.

#### 4.7. GARCH Model Results for Daily Returns to EGX30 Indicator

From Table 4, it is clear that

- The parameters of the GARCH model (1, 2) related to ARCH, GARCH (-1), GARCH (-2) have a significant effect on the daily returns divergence box of the Egyptian stock market, at a level of significance less than 0.05 and 0.001, respectively, which indicates the high volatility in the daily returns on the Egyptian Stock Exchange as an indication of the inefficiency of the Egyptian stock market on the weak level of low internal and external efficiency.
- The sum of the parameters of  $\beta + \alpha$  in the GARCH model (1, 2) according to whether the random error is a normal distribution approaching the correct one and is positive, which indicates the fulfillment of the conditions of non-negativity of variance and the non-amplification of variance, as it is an indication of Volatility Shocks continuity in the daily returns of the Egyptian stock market index EGX30.
- Homogeneity and stability are of conditional variance of random errors of the GARCH model (1, 2) when random error is distributed according to the normal distribution, where the value of ARCH-LM (0.879) is not significant at a level of significance greater than 0.05.
- After verifying the stability of the conditional variance of random errors with the ARCH-LM test, self-correlation and partial self-correlation of the standard errors square according to the random error distribution of the GARCH model (1, 2), to make sure that the problem of sequential correlation is solved, are in Table 5.

It is clear that there is no subjective and partial hierarchy correlation in the standard random errors box for the daily returns series of the stock market index in Egypt EGX30, which is not at a level of significance greater than (0.05) in all displacements, and then accepting the imposition of nothingness, For GARCH model (1) when random error is distributed according to normal distribution.

## 5. DISCUSSION

In financial studies, researchers have used the random walk theory, which states that a rational investor who throws arrows at stocks on the pages of the New York Times list will have a good chance of outperforming the market. The assumptions of the random walk theory can be explained as follows. First those who adhere to this theory consider that it is wrong to search for stocks of companies that are undervalued or to predict future price movements or returns for the same securities.

Second Those who follow this theory say that it is unlikely that you would expect these events and that all investors could do so in order to accept the assumptions of the efficiency of financial markets, which are referred to in the assumptions of the efficiency of financial markets (Jarrett, 2010).

Theory of (Fama, 1991) and cited by (Hatem, 2009) studied the assumptions of the market on a large scale. Regarding the relationship between information and market prices, he explained that the market that reflects the prices completely and the information available in it is the efficient market and suggested that there are three types of tests for the efficiency of the market that reflect the various information leading to changes in prices: the weak efficiency test, the semi-strong efficiency test, and the strong efficiency test. First to test a weak efficiency form, the information system is bounded to historical prices. It is suppose that the successive price variations are independent, and the changes are distributed directly. Second the semi-strong efficiency form test integrates the information available to the public in the appropriate or relevant information group. Third as for the strong efficiency form test, it reflects all available information, whether private or public. Empirical studies indicated that efficient market hypothesis (e.g., Abakah et al., 2018).

**Table 5: The values of the Ljung-Box test for self-correlation and partial self-correlation of the standard errors square according to the normal distribution**

LAG	AC	PAC	Q-stat	Sig.	LAG	AC	PAC	Q-stat	Sig.
1	0.019	0.019	0.8806	0.348	19	-0.039	-0.042	23.26	0.226
2	0.006	0.006	0.9829	0.612	20	-0.01	-0.008	23.521	0.264
3	-0.005	-0.006	1.0572	0.787	21	-0.008	-0.006	23.677	0.309
4	-0.005	-0.005	1.1148	0.892	22	0.017	0.019	24.401	0.327
5	0.014	-0.014	1.6283	0.898	23	0.001	0.002	24.403	0.382
6	-0.038	-0.037	5.1343	0.527	24	-0.003	-0.004	24.43	0.437
7	-0.028	-0.026	7.063	0.422	25	0.022	0.021	25.589	0.43
8	-0.023	-0.022	8.3772	0.398	26	0.049	0.047	31.518	0.21
9	-0.003	-0.002	8.3939	0.495	27	-0.008	-0.009	31.67	0.245
10	-0.018	-0.019	9.1971	0.514	28	0.019	0.022	32.604	0.251
11	-0.028	-0.029	11.148	0.431	29	0.007	0.006	32.721	0.289
12	-0.02	-0.029	12.129	0.435	30	-0.005	-0.007	32.789	0.332
13	-0.008	-0.01	12.283	0.505	31	0.015	0.014	33.36	0.353
14	0.019	0.017	13.224	0.509	32	-0.005	-0.003	33.412	0.399
15	0.025	0.023	14.844	0.463	33	0.036	0.042	36.614	0.305
16	0.007	0.003	14.979	0.526	34	-0.024	-0.02	38.05	0.29
17	0.04	0.037	19.076	0.324	35	0.057	0.062	46.117	0.099
18	-0.012	-0.017	19.434	0.366	36	-0.034	-0.03	49.105	0.071

Efficient stock prices permit agents to diversify the sources of their financial investments and spread the risk of investment. Such markets in which the stock prices reflect all the available information is called a competent market. The markets in some countries are considered incompetent, so the policy of the market makers in these countries should support the structure of institutions by providing information on pricing. Technology is the primary key to improving the efficiency of these markets; thus, its speed in the dissemination of information must be improved through administrative newspapers.

In line with this symposium the literature has reported that the efficiency of future markets indicates a reality in which the future price appropriately integrates all available information about future conditions of supply and demand. According to the hypothesis of market efficiency and market participants, reaching the appropriate price may be possible by incorporating any information related to conditions of supply and demand. For the commodity, this is very important, but it is not sufficient in the case of impartiality in future markets, as the participants are not rational in the market, nor are they neutral in risk. If future prices are largely determined by these traders who hate risk, then future prices are biased; this difference is called the risk premium in the market. The unbiased market must be effective and should not contain the risk premium. However, risk premium does not need to be fixed and may vary according to market fluctuations, so there is a different risk premium for time. Future markets can be efficient and unbiased in the long run, but incompetent situations may appear and may not be unbiased in the short term (Ranganathan and Ananthakumar, 2014).

## 6. CONCLUSION

The main objective of this paper is to study the efficiency assumptions of the Egyptian market and the characteristics of the random movement of stock prices with a focus on the weakly efficient form, as there are few studies that have studied the weakly efficient form that compares changes in prices in emerging and

industrial markets. The results show that most companies are the weak form of efficient.

This study measures the behavior of stock prices in all companies recorded in the trading market in Egypt and the assumptions that have been tested are whether the market is efficient and if the prices follow a random movement. If this is right, then the past information and previous prices are not suitable for expecting the future. For all companies listed in Egypt to test their proficiency in the trading market, the random movement of prices is more than efficient. The research question is whether the prices in the trading market in Egypt follow the random movement.

Market efficiency assumptions focus on the efficient use of information in determining market prices as well as show an interest in an efficient market. Inefficient financial markets assume that market signals can achieve abnormally high rates of return in the stock market (Hatem & Morgan, 2009).

Market efficiency assumptions require that investors cannot overcome the market because stock prices reflect all information in the range or occasion and that in the efficient market there are a major number of rational investors who pit with each other and try to forecast future prices for individual and stock information. Important and available information or each of them and this competition will completely affect the new information on the real values to immediately reflect on the actual prices, which according to these assumptions cannot outperform the market (Jarrett, 2010).

Fama (1970) cited by (Jarrett, 2010), (Nwachukwu and Shitta, 2015). explained that the market that fully reflects prices and the information in it is available in that efficient market, and I suggest that there are three kinds of market efficiency tests that reverberate several information that leads to price changes. He also suggested that there are three kinds of tests for market efficiency that reflect different information that lead to changes in prices. As for testing a weak form, the information system is useful for previous prices. It is supposed that sequential price variations are separate, and

variations are allocated directly. As for the market test of semi-efficiency, it integrates the relevant information, and for the strong efficiency test, it reflects the set of information that includes all available information, whether private or public.

## REFERENCES

- Abakah, E.J.A., Alagidede, P., Mensah, L., Ohene-Asare, K. (2018), Non-linear approach to random walk test in selected African countries. *International Journal of Managerial Finance*, 14(3), 362-376.
- Chigozie, O.G. (2009), Analysis of weak-form efficiency on the Nigerian stock market. *The International Journal of Applied Economic and Finance*, 4(2), 1-5.
- Fama, E.F. (1970), Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383-417.
- Fama, E.F. (1991), Efficient capital markets: II. *The Journal of Finance*, 46(5), 1575-1617.
- Hatemi, J.A., Morgan, B. (2009), An empirical analysis of the informational efficiency of Australian equity markets. *Journal of Economic Studies*, 36(5), 437-445.
- Jain, P., Vyas, V., Roy, A. (2013), A study on weak form of market efficiency during the period of global financial crisis in the form of random walk on Indian capital market. *Journal of Advances in Management Research*, 10(1), 122-138.
- Jarrett, J.E. (2008), Random walk, capital market efficiency and predicting stock returns for Hong Kong exchanges and clearing limited. *Management Research News*, 31(2), 142-148.
- Jarrett, J.E. (2010), Efficient markets hypothesis and daily variation in small Pacific-basin stock markets. *Management Research Review*, 33(12), 1128-1139.
- Jiang, J. (2017), Cross-sectional variation of market efficiency. *Review of Accounting and Finance*, 16(1), 67-85.
- Kharbanda, V., Singh, A. (2018), Futures market efficiency and effectiveness of hedge in Indian currency market. *International Journal of Emerging Markets*, 13(6), 2021-2027.
- Nwachukwu, J.C., Shitta, O. (2015), Testing the weak-form efficiency of stock markets. *International Journal of Emerging Markets*, 10(3), 409-426.
- Pradhan, H.K., Narasimhan, L.S. (2002), Stock price behaviour in India since liberalization. *Asia Pacific Development Journal*, 9(2), 83-106.
- Ranganathan, T., Ananthakumar, U. (2014), Market efficiency in Indian soybean futures markets. *International Journal of Emerging Markets*, 9(4), 520-534.
- Ren, L., Ren, P. (2017), Testing the market efficiency by mean absolute deviation. *Benchmarking: An International Journal*, 24(7), 2049-2062.
- Syed, A.M., Bajwa, I.A. (2018), Earnings announcements, stock price reaction and market efficiency-the case of Saudi Arabia. *International Journal of Islamic and Middle Eastern Finance and Management*, 11(3), 416-431.
- Varamini, H., Kalash, S. (2008), Testing market efficiency for different market capitalization funds. *American Journal of Business*, 23(2), 17-26.