

The Efficiency Of The Nigerian Stock Exchange : A Theoretical And Empirical Analysis

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INTRODUCTION

A capital market is a network of financial institutions and facilities that interact to mobilize and allocate long-term savings in an economy. The long-term funds are exchanged for financial assets issued by borrowers or traded by holders of outstanding eligible instruments. Therefore, it provides services that are essential to a modern economy, mainly by contributing to capital formation through financial intermediation, financial advisory services, and managerial skill development. In addition, the capital market facilitates portfolio diversification that allows savers to maximize returns on their assets and reduce risks. Consequently, an efficient capital market optimizes the amount of savings that finances investment at any level of savings (Odoko, 2004).

Moreover, the capital market is the long-term end of the financial market. It is made up of institutions, which facilitate the issuance and secondary trading of long-term financial instruments. Unlike the money market, which provides short-term loans, the capital markets provide long-term loans to industries, commerce, governments, and local authorities. The capital market is made up of a number of institutions and intermediaries, through which surplus funds of the community are channeled to the deficit units in need of additional funds for medium or long-term investments, or for the expansion of existing investments, or for the modernization of the production line or to broaden the capital base to enhance the enterprise's leverage (SEC, 2005).

Basically, the Nigerian capital market is divided into two separable but closely related segments, the primary market and the secondary market. The primary market is the market where issues of securities are offered to the public, it also provides the vehicle for government and corporate entities to raise fresh capital through the issuance of securities. It could be shares of common stocks or preferred stocks (equities) or debt instruments such as corporate bonds, or development stocks (Bonds). An agency of the government can raise borrowed funds from the market also (Udo, 2002). The secondary market or the stock market is a forum through which sellers and buyers trade on securities which have been listed on the exchange. The existence and allocative efficiency of the primary market is, however, dependent upon the existence and efficiency of the secondary market in all respects. A stock market can appropriately be said to be an important instrument of economic development in a free market enterprise economy (Mbat, 2001).

Furthermore, the secondary market is an important arm of the securities markets and perhaps, the better-known aspect of the market. Its basic function is fostering and formalizing transfers of existing securities among investors. It is, in essence, a resale market, where securities originally issued in the primary market are bought and sold. Functionally, the secondary market provides liquidity to investors by enabling them to convert their securities into cash. The ease with which securities can be converted into cash is an important determinant of the efficiency of the secondary market. However, the Nigerian stock market, since inception, has had various problems such as - the buy and hold strategy by investors, the fear of insiders using price manipulation, low volume of stocks available in the market, the huge backup of unclaimed dividends and the sudden collapse of over 50 commercial and merchant banks in the past constitute a serious problem for the market. The aforementioned problems retain a good number of prospective investors and participants from being active players in the Nigerian stock market (Nzotta, 2004). Therefore, the study was conducted to establish the extent to which past information will determine the present or future stock prices. Furthermore, the main objective of this paper was to determine investors' reliance on the use of historical data as a tool for predicting future stock prices in the Nigerian stock market.

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THEORETICAL FRAMEWORK

The thesis is anchored mainly on the Efficient Market Hypothesis (EMH). Generally, the issue of stock market efficiency is categorized into two - operational efficiency and informational efficiency (Bumol, 1965; Fama, 1970; Jensen, 1978; Mossin, 1977; Copland and Weston, 1983; and Thygeson, 1993 among others). Thus, a stock market that is operationally efficient may not be informationally efficient and vice versa. And to be inefficient, it means that a stock market is either operationally or informationally inefficient. What it also means is that in whichever way the stock market becomes efficient (either operationally or informationally), the economy is better for it. Olowe (1996, 1997), Fama (1970) and Khoury (1983) viewed capital market efficiency from the roles the capital markets are expected to play in the economy, which can be classified into three:

i) Allocation Efficiency: The role of a capital market here is to optimally allocate scarce savings to productive investments in a way that benefits everyone. Thus, share prices are determined in a way that equates the marginal rates of return of all lenders (savers) and borrowers.

ii) Operational Efficiency: A market is said to be operationally efficient if intermediaries, which provide the service of channeling funds from savers to investors do so at the minimum cost that provides them a fair return for their services.

iii) Pricing Efficiency: This is a market where prices are used as signals for capital allocation. Forces of demand and supply set the prices. A market that is price efficient implies efficiency in the processing of information. The prices of capital assets anytime are based on the correct evaluation of all information available at that time. Thus, in finance literature, the focus is more on pricing efficiency, although pricing efficiency implies in a limited sense, operational and allocative efficiency. Formally, the study defines capital market efficiency as a market where security prices quickly and fully reflect all available information. If a market is efficient, any/all devices intended to out perform the market will be rendered useless. No scheme devised by any individual should result in consistently higher returns than those realized on a buy and hold strategy. In an efficient market, the same rate of return for a given level of risk should be realized by all investors. The behaviour of any participant or group should not influence the price of a security in the market.

EFFICIENT MARKET HYPOTHESIS (EMH)

The Efficient Market Hypothesis supplies a theoretical framework, which leads to support the random walk character of share prices. But what exactly do we mean by an “efficient” market? An efficient market is one where at any one-time, prices take into account all available information. Market participants are assumed to act in an intelligent, self-motivated manner to assess and act upon available information about share prices when formulating their buy or sell decisions. If some available information about a specific share is not acted upon, then an opportunity will arise, for at least some market participants, to use that information to their advantage by buying or selling the share. Thus, as market individuals or organizations act upon this information, the price of the share will adjust accordingly until there are further profit opportunities. This has been referred to as “information arbitrage” efficiency (Tobin, 1958).

It is important to note that this is a very particular and highly restrictive definition of efficiency. It refers to the ability of the market to process information in such a way so as to use it to the best advantage. It does not imply that stock markets are efficient in the economist's more normal sense of the word - that it is providing services - at least cost in terms of resources employed. Indeed, throughout the period when the question of “market efficiency” first began to impinge on the consciousness of financial analysts, there was relatively little attention paid to issues such as freedom of entry and the widespread use of fixed commissions – blatantly anti competitive and inefficient practices. It was not until 1975 (New York) and 1986 (London) that such practices were abandoned in two of the world's acknowledged informationally efficient markets. Indeed, it is still the case that they linger on in other markets. At the same time, operational efficiency of many stock exchanges was appealing as evidenced by the settlement failures in the back office crises experienced in New York in the late 1960s and London in the 1980s (Foley, 1991).

Mossin's (1966) paper was of importance for the emergence of the modern literature concerning the efficient market hypothesis. Unlike the random walk approach, Samuelson's analysis with its characterization of equilibrium using a martingale model constituted an economic model of asset price determination that could be linked with traditional assumptions about preferences and returns. A price follows a martingale process if on an average, it remains stable – that is, it varies randomly about a constant mean. Foley (1991) suggested that it is best to view the martingale model as

an extreme version of the fundamental model modified by assuming that a large majority of traders are conducting fundamental analysis, and are arriving at the same estimates of fundamental values, and are trading appropriately. Fama's (1970) survey marked the start of the modern literature on efficient capital markets. Fama's paper, like the material it surveyed, was largely concerned with empirical work. However, Fama also provided some preliminary theoretical discussion and these theoretical remarks (together with his 1970 contribution) were influential in the sense of determining the nature of the work which followed. Fama utilized the martingale model, and it should be stressed that by doing so, he identified market efficiency with the validity of a particular model of equilibrium in financial markets.

THE WEAK FORM OF EFFICIENT MARKET HYPOTHESIS

The weak form of the Efficient Market Hypothesis states that the information set that prices of securities in the market reflect is composed of all data regarding the historical market prices and trading volume of securities. It says that all information conveyed in past patterns of a stock's price and volume of trading is currently impounded into the price of the stock. The implication of the weak-form is that it is fruitless for an investor to study a chart of the past price patterns of a stock in hopes of determining when to buy and when to sell the stock (French, 1989).

In addition, Khoury (1983), Olowe, (1996), Fama (1970) in Olowe (2005) contended that the weak-form efficiency is concerned with the adjustment of security price to historical price or return information. If the market is weak-form efficient, no investor can earn any excess or abnormal return based on historical price or return information. The weak-form efficiency is essentially a refutation of technical analysis. The technical analysts believe that market prices exhibit identifiable patterns that are bound to be repeated. The art lies in devising a proper technique to identify trends, interpret them, and interpret any deviation from them. In a weakly efficient market, past price and volume data are already impounded in security prices, and no amount of chart reading or any other trading device is likely to outperform the buy and hold strategy.

THE SEMI-STRONG FORM OF EFFICIENT MARKET HYPOTHESIS

For the semi-strong form of the Efficient Market Hypothesis, the information set expands to encompass all public information. This information includes both the original raw information about the economy or an individual security, and any publicly available analyses or projections made using the raw data. The semi-strong form theorizes that each security's price fully reflects all information contained in the company's financial statements, potential analysis of the information, news releases, economic data, and so forth. The existence of an effective market at the semi-strong level means that investors would generally not have any available source of information that could lead them to beat the market. Of course, they could expect to make profits in the market, but their profit would only be a normal amount considering the riskiness of the investments. However, such activities as analyzing financial statements, forecasting company earnings, and following the advice of a popular investment newsletter would not contribute to increased investment profits, and might even lower returns by increasing costs, while not adding to profits (French, 1989).

THE STRONG FORM OF EFFICIENT MARKET HYPOTHESIS

The set of information reflected in security prices in a strong form efficient market is all information; this includes everything that is known, whether it is public or private. This form says that the market reflects all inside information in addition to all public information. It also reflects everything that is knowable - anything that a host of investment analysts could possibly uncover using all of their talents and all of the tools at their disposal (French, 1989).

Olowe (1997) stressed that the strong form efficiency is concerned with whether security prices fully reflect all information available to the public or not. In a strongly efficient market, no individual can earn an abnormal profit from any information, even if he has monopolistic access to such information.

Onoh (2002), Akpan (2004), Olowe (1997), Anyanwu (1993), Nzotta (2004), and Nwankwo (1980) confirmed that the Nigerian stock exchange was formed in September 1960 following the adoption of the Barback committee report of 1959. This committee investigated the ways and means of promoting a stock market in Nigeria. The committee recommended the creation of facilities for transacting in shares, the establishment of rules regulating transfers, the reduction or elimination of stamp duties on transfer, and the elimination of tax deduction at source, including measures to encourage saving and issue of securities by the government and other organizations (Nwankwo, 1980). The

recommendations made by the committee led to the promulgation of the Lagos Stock Exchange Act of 1961. The exchange was thus incorporated in 1961 by a group of businessmen, the NIDB, the CBN, and the federal government of Nigeria, and it began operations on June 5, 1961.

Thirteen securities were listed on the exchange when it began operations in 1961. These securities included development stocks issued by the Government, preference shares, and ordinary shares of various companies. According to Asalu (1996) and Nzotta (2004), also included were seven securities of British companies operating in Nigeria, whose shares were already quoted on the London Stock Exchange. These companies, to a large extent, influenced activities at the capital market. The Lagos Stock Exchange later metamorphosed into the Nigerian Stock Exchange following the Okigbo financial system review committee report of 1976. This committee recommended the establishment of two independent stock exchanges in addition to the Lagos Stock Exchange. The Government rather approved the establishment of the Nigerian Stock Exchange, but with branch exchanges at Kano, Kaduna, Port Harcourt, and Onitsha. The Nigerian Stock Exchange operated as the only stock exchange in Nigeria until 1998, when the government approved the establishment of the Abuja Stock Exchange as an independent stock exchange.

The ownership of the Nigerian Stock Exchange (NSE) is vested in its members. There are two types of memberships - ordinary and dealing numbers. An ordinary member (institution or individual) of the Nigerian Stock Exchange (NSE) is a member who has, in accordance with the Articles of the exchange, taken up qualifying shares of the issued share capital of the exchange, and has been admitted into the register of members. A dealing number (referred to as a stockbroker) is a person or institution who, in addition to being an ordinary member, is licensed to buy and sell securities on the trading floor of the exchange on behalf of the investing public (Onoh, 2002).

The Nigerian Stock Exchange (NSE) is a self-regulatory organization in the capital market: The Securities and Exchange Commission (SEC) Decree of 1988 provided that Securities and Exchange Commission (SEC) can delegate a part of its functions to the stock exchange (Onoh, 2002).

EMPIRICAL LITERATURE

The results of the researchers on the Nigerian Stock Market pose a barge of conflicting signals. Yacout (1980) tested the correlation weekly price of 21 companies quoted at the Nigerian Stock Exchange (NSE) between July 1977 and July 1979. The result showed that the price follows a random walk, thus confirming the efficiency of the market. Furthermore, Ayadi (1984) tested the price behaviour of 30 securities quoted at the Nigerian Stock Exchange (NSE) from 1977-1980 using the Monday closing prices of these shares after adjusting for cash dividends and scripts issues. He found out that the share price movements followed a random walk. That is to say that the past prices of shares are of no value in predicting future prices, thus confirming the efficiency of the market. Again, Osisioma (1989) tested 30 securities of the Nigerian Stock Exchange (NSE) over a 6 year period (1981-1985).

❖ **Synthesis of Related Literature :** It is evident from the review of literature on the efficient market theory that the studies by different scholars did not all produce results that were mutually consistent or agreeable. Some supported the random walk hypothesis, while others refuted it. Thus, the insights into the various contents of the debate. The different studies on efficiency of the Nigerian stock market showed conflicting results. Some researchers are of the opinion that the Nigerian stock market is efficient, while others looked at the market as inefficient. However, in the study, efforts would be made to overcome the various weaknesses of these studied discussed above. This is to establish the true position of the Nigerian stock market with respect to the level of its efficiency.

METHODOLOGY

Every research has an objective to achieve, therefore, the primary objective of this study is to ascertain the level of efficiency of the Nigerian stock market. In order to determine the level of efficiency, the historical data of the Nigerian Stock Exchange (NSE) were used to measure the weak form efficiency of the Nigerian Stock Exchange. Based on the efficient market theory, stock prices should indicate random walk overtime. This implies that no systematic price movements or monopoly profits would be expected as a large number of buyers and sellers seek to make a profit by frequent trading on even the smallest piece of information. Thus, properly anticipated prices will fluctuate randomly (Fama, 1970). The movement of series overtime can be considered under the following scenario :

Let RET_t = price of stock at a given time period t (current Return);

RET_{t-1} = Price of stock at a previous time period.

The objective of the study is to establish whether there is a relationship between price of period (t) (RET_t) and price at previous time period ($t-1$) (RET_{t-1}). Thus, the random walk model stocks prices that where RET_{t-1} should be independent and identically distributed, that is randomly. Therefore, where SMP_t depends on SMP_{t-1} , then there is serial correlation, on the other hand, when RET_t does not depend on RET_{t-1} , then the return variables are random and therefore independent. The functional relationship may then be represented as:

$$1. RET_t = f(RET_{t-1})$$

$$\Delta RET_t = \alpha_0 + \alpha_1 \Delta RET_{t-1} + \mu$$

RET_t = current period;

RET_{t-1} = previous period;

Δ = Change;

α_0 = equation constant;

α_1 = equation parameters;

μ = stochastic error terms.

RESULTS AND INTERPRETATION

Table 1 : Descriptive Statistics Of Variables	
	RETURNS
MEAN	0.019151
MEDIAN	0.017063
MAXIMUM	0.381977
MINIMUM	-0.306416
STD. DEV.	0.062243
SKEWNESS	0.283577
KURTOSIS	11.16230
JARQUE-BERA	828.4418
Source: Authors' computation (2012)	

The Table 1 above provides the descriptive statistics of stock returns. The indexes have a low means and standard deviation, and high kurtosis (more than 3), meaning that it is abnormal.

Table 2 : Unit Root Test Summary Results			
VARIABLE	ADF TEST	PP TEST	ORDER INTEGRATION
RETURNS	-5.547391	-9.032468	1(1)
Critical Values: (ADF): 1%-3.4549; 5% -2.8717; 10% -2.5722			
(Phillips-Perron): 1%-3.5541; 5% -2.7217; 10% -2.6402			
Source: Authors' Computation (2012)			

The Table 2 shows the results of both the Augmented Dickey-Fuller (Dickey and Fuller, 1979) and the Phillips-Perron test (Perron, 1990). The results reveal that the original series is not stationary, but the first differenced series is stationary.

The results in the Table 3 reveal that most of the returns are significant, indicating a serial correlation between past returns and present returns. The D.W statistics of 1.990840, which is very close to 2, shows absence of auto correlation. Furthermore, the overall F-statistics is significant. However, both the R-square and the adjusted R-square

Table 3 : Testing Weak-Form Of Efficiency In The Nigerian Stock Exchange				
Dependent Variable:D(RETURNS)				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RETURNS)(-1)	0.186394	0.061427	3.034390	0.0027
D(RETURNS)(-2)	0.131170	0.062086	2.112705	0.0356
D(RETURNS)(-3)	0.114079	0.062746	1.818115	0.0702
D(RETURNS)(-4)	-0.175802	0.062780	-2.800297	0.0055
D(RETURNS)(-5)	0.274953	0.063817	4.308459	0.0000
D(RETURNS)(-6)	-0.018922	0.066546	-0.284347	0.7764
D(RETURNS)(-7)	-0.036191	0.066514	-0.544115	0.5868
D(RETURNS)(-8)	-0.001072	0.070322	-0.015248	0.9878
D(RETURNS)(-9)	0.164579	0.070537	2.333234	0.0204
D(RETURNS)(-10)	0.005896	0.072042	0.081846	0.9348
D(RETURNS)(-11)	-0.130548	0.071288	-1.831292	0.0682
D(RETURNS)(-12)	0.139125	0.072433	1.920751	0.0559
R-squared	0.137143	Mean dependent var		0.018462
Adjusted R-squared	0.100778	S.D. dependent var		0.063953
S.E. of regression	0.060645	Akaike info criterion		-2.724590
Sum squared resid	0.959919	Schwarz criterion		-2.565931
Log likelihood	383.9065	F-statistic		3.771234
Durbin-Watson stat	1.990840	Prob(F-statistic)		0.000050
Source: Authors' computation (2012)				

Table 4 : Testing Weak-Form Of Efficiency In The Nigerian Stock Exchange (Using Two Stage Least Squares)				
Dependent Variable:D(RETURN)				
Instrument list: RETURNS(-1) RETURNS(-2) RETURNS(-3) RETURNS(-4) RETURNS(-5) RETURNS (-6) RETURNS(-7) RETURNS(-8) RETURNS(-9) RETURNS(-10) RETURNS(-11) RETURNS(-12)				
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Adjusted R-squared	0.100778	S.D. dependent var		0.063953
S.E. of regression	0.060645	Sum squared resid		0.959919
F-statistic	3.771234	Durbin-Watson stat		1.990840
Prob(F-statistic)	0.000050			
Source: Authors' computation (2012)				

are very low, which is not important, since the main concern is looking for serial correlation. The results in the Table 4, which is also testing the weak-form of efficiency in the Nigerian Stock Exchange, confirms the results presented in the Table 3.

However, the results of entire analysis confirmed the presence of serial correlation regarding past and current stock returns in the Nigerian Stock Market. The stock return tendered to display a systematic movement rather than a random movement over time. This trend indicates imperfections in the market with great price volatility, which could allow a certain class of investors with superior information to reap abnormal returns from the market.

CONCLUSION AND RECOMMENDATIONS

We know from the theory of choice that decision-makers stock the best option out of the available alternatives in order to attain optimal benefits. The same way, the availability of information plays a key role for investors to make optimal decisions on the choice of securities in the stock market. This matter is weighty because in the absence of adequate information, securities in the market may either be overpriced, or under priced. No wonder Kitchen (1993) told that risk estimates may be hazy because of lack of information.

However, the paper is on the efficiency of the Nigerian stock market in the weak form, i.e. the current price of securities in the market reflects all the information contained in the historical price pattern, so that past prices' service cannot be used to predict the future prices of the stock. The study, therefore, centers on the analysis of past service of stock prices to know whether they have to be linked with the current prices of stocks. The popular Efficient Market Hypothesis (EMH) model of stock market efficiency was employed. A system of three equations was modeled to test the validity of the random walk with data from the Nigerian stock market. In the study, the researchers attempted to provide a theoretical and empirical analysis of the efficiency of the Nigerian stock market. The results indicate that the Nigerian stock market is inefficient in price determination, which provides the opportunity for a given class of investors to reap abnormal returns. Some factors were equally identifiable, as being largely responsible for the imperfection in the market, which is believed, should provide a basis for sound policy actions.

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