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Fama's model of efficient market: Analysis of the performance of insurance companies and the insurance stock price movement in Nigeria

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Abstract

The study analyzed the performance of insurance companies and the insurance stock price movement in Nigeria using Fama's model of efficient market approach. Lack of information about insurance stock prices movement can influence investor's decision making on insurance stock investments. An ex post facto research design was employed in the study. The research covers the activities of 19 insurance companies that are listed on the Nigerian Stock Exchange as at December 31, 2022. The data sample of the study comprises of daily stock prices data of 19 listed insurance companies for the period January 4, 2022 December 30, 2022. Fama-French three factor coefficient estimates obtained from quantile regression was used to test the hypothesis. The results revealed that there is a significant relationship between the insurance stock price movement and the performance of insurance companies in Nigeria, and that such relationship is negative. Recommendations were that there should be perfect information about stock market forces of demand and supply because if there is information asymmetry through which borrowers (securities issuers) know more about the risks than the lenders to (securities purchasers), the market participants may be reluctant to trade with insurance stocks, whose characteristics and behaviour under varying economic conditions are not well known. Also, it is important for the regulator in formulating policies that encourage diversification of investments among others.

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1. Introduction

The concept of market efficiency was proposed by Eugene Fama in 1965. Market efficiency means that the price which an investor is paying for the financial asset (stock, bond, other security) fully reflects fair or true information about the intrinsic value of this specific asset or fairly describes the value of the company – the issuer of this security. The key term in the concept of market efficiency is the information available for investors trading in the market. It is stated that the market price of stock reflects all known information, including past information, e.g., last year's or last quarter's, month's earnings; current information as well as events, that have been announced but are still forthcoming, e.g. shareholders' meeting. Information that can reasonably be inferred, for example, if many investors believe that there will be an increase in interest rate in the nearest future or the government deficit increases, prices will reflect this belief before the actual event occurs.

Capital market is efficient, if the prices of securities of insurance companies which are traded in the market, react to the changes of situation immediately, fully, and credibly reflect all the important information about the security's future income and risk related with generating this income. Insurance investors need access to the information. From economic point of view the important information is defined as such information which has direct influence to the investor's decisions seeking for his defined

financial goals.

Market efficiency requires that the adjustment to new information occurs very quickly as the information becomes known. Obviously, the Internet has made the markets more efficient in the sense of how widely and quickly information is disseminated.

Globally, the performance of insurance companies is an important indicator of a thriving economy that could lead to an increase in Gross Domestic Product (GDP) of a nation, more specifically non-banking sector like insurance companies (USAID, 2012). Furthermore, the world economy has become more integrated; firms have been facing more and more pressure to disclose their business performance. In this view, regulators worldwide are negotiating and harmonizing global insurance regulations which could lead to greater standardization of insurance policies and promote globalization of the insurance value chain. So, a better understanding of the performance of insurance companies in Nigeria through an empirical study is of the interest of regulators and other market participants such as financial institutions that are eager to provide financing for insurance companies to enhance their performance.

Furthermore, for the past decade, measuring companies 'performance has continued to be a critical area of social science research. Many authors paid more attention to modifying the traditional financial measures in developing models for performance measurement, while others have suggested non-financial measures. Moreover, the performance of a company can also be measured in the form of qualitative features like market position, quality of product, and goodwill of the customers. Some of the models used in assessing and measuring the performance of organizations include economic profit, residual income, economic value added, balanced score card, activity-based costing, cash value added, shareholder value added, total shareholder return, cash flow, and return on investment. Additionally, some shareholders, regulators and other stakeholders adopt several ways to compare organization's performance concentrated on variables like turnover, total earnings, profit before interest and taxes, earnings per share, total assets and share price in the measurement of companies 'performance. However, the application of these variables varies from one industry to another. Therefore, this study utilizes companies 'stock prices movement independent variable, while gross premium income growth rate was used as surrogate for performance and monetary policy rate employed as control variable. The choice of these variables has been motivated by numerous accounting and finance literatures reviewed in this study. Researchers use these internal environmental variables to measure the corporate performance as observed in the work of. The variables used can be measured easily by using the data afforded by Nigerian insurance companies.

The link between the performance of insurance companies and the insurance stock price movement has often generated strong controversy among analysts based on their studies of develop and emerging markets. The financial structure of a firm, that is, the mix of debt and equity financing, changes as economies develop. The tilt is however more towards equity financing through the stock market. The determination of the overall performance of insurance companies depends on how efficiently the stock market performs its allocative functions as shown by insurance stock price movements. Developing countries' equity markets have received radical changes in

many aspects. For example, the introducing an automated internet transaction marketing of the exchange market securities causes the market to benefit with current economic globalization. It is against this background that this study has gained the importance in the corporate finance literature to analyze the performance of insurance companies and the insurance stock price movement in Nigeria using Fama's model of efficient market approach.

1.2. Statement of the Research Problem

According to NIA (2018), the performance of insurance companies is below average and the insurance industry is yet to convert the huge opportunities that abound. The insurance companies are still striving to improve capital to increase their retention capacity, embrace innovation and significantly invest in Micro insurance to deepen penetration; and the concerned regulatory authorities to remove the bottlenecks affecting Bancassurance and reintroduce Mobile insurance in order to drive performance of the industry (NIA, 2018). Lack of information about insurance stock prices movement can influence investor's decision making on insurance stock investments. The significance of a developed stock market in the growth of any economy cannot be overemphasized in view of its potential and likely impact on the economy if well harnessed. It is a known fact that nations cannot develop without the needed long-term funds for development projects. The more developed a stock market is, the higher the potential for sourcing of long-term fund for industrialization.

According to Nigeria is the African largest capital market in the continent of Africa. Yet there are numerous problems facing Nigerian Stock Exchange operation. The problems which impaired NSE from contributing significantly to economic growth as observed and supported include Global phenomenon, Pull-out of various foreign investors, Lack of necessary infrastructures and high production cost, Impact of commercial banks, Avalanche of private placement Offers, Inability of the federal government to plot bailout option, Regulation inconsistencies and pronouncement, and Pressure from bank. These problems negatively affected insurance stock prices movement, market capitalization, total volumes and values of equities and debts, total numbers and values of deals as well as all share index of the Nigerian Stock Exchange.

Also, when compared with other emerging and developed markets, it becomes obvious that the Nigerian Stock Exchange is still relatively small in size and underdeveloped. For instance, a comparison of the Nigerian stock market in terms of number of listed equities reveals that while Nigeria has only 35 equities listed in 1990, 214 equities in 2005. CBN Statistical Bulletin (2015) revealed that Nigeria has 41 equities listed in 1991, but rose to 955 equities in 2015. Even though its stock exchange came into fruition in 1960, Singapore has over 500 numbers of listed equities (Established in 1979). Hong Kong has 695 (established in 1986) and Istanbul has over 900 (established in 1986). This thus highlights the relative poor performance of the Nigerian stock market vis-à-vis those of other countries. Moreover, opined that less than 21 percent of the 400,000 registered companies in Nigeria are not currently quoted on the Nigerian Stock Exchange, a situation which he attributes to the unattractiveness of the market as well as lack of incentives for more companies to go public. In support of this claim, as at December, 2022, there were 21 insurance companies listed

on the Nigerian Stock Exchange (NSE, 2022). This implies that insurance companies in Nigeria have not performed well enough to secure license for new entrants into the stock market. However, while the growth of the stock market has been impressive, the abysmal performance of insurance companies has influence the volatility of their stock prices in the market. Grounded on the above highlighted problems, it becomes imperative to embark on an empirical study of this nature that seeks to analyze the performance of insurance companies and the insurance stock price movement in Nigeria using Fama's model of efficient market approach.

1.3. Objectives of the Study

The main objective of the study is to analyze the performance of insurance companies and the insurance stock price movement in Nigeria using Fama's model of efficient market approach. The specific objective is to examine the relationship between the insurance stock price movement and the performance of insurance companies in Nigeria.

1.4. Research Hypothesis

H01: There is no significant relationship between the insurance stock price movement and the performance of insurance companies in Nigeria.

2. Literature Review

2.1. Conceptual Review

Under this heading, related concepts are reviewed to give more insight into the study.

2.1.1. Overview of efficient market

The economic reasoning behind market efficiency is deceptively simple. If an investor knows that an asset price will increase tomorrow, then he buys it today. If all investors try to buy the asset today, then in market equilibrium the price increases today to equal tomorrow's expected price. Market efficiency implies there are no expected (excess) returns, or (Approximately) that price changes are unpredictable. Eugene formalized the notion of an efficient market and presented tests of efficiency expands on Fama's definition that a capital market is said to be efficient if it fully and correctly reflects all relevant information in determining security prices. Formally, the market is said to be efficient with respect to some information set, if security prices would be unaffected by revealing that information to all participants. Moreover, efficiency with respect to information set, implies that it is impossible to make economic profits by trading on the basis of that information set. The classic taxonomy of information sets distinguishes among Weak-form Efficiency - the information set includes only the history of prices or returns; Semistrong-form Efficiency - the information set includes all publicly available information; and Strong-form Efficiency-the information set includes all (public and private) information.

Under the weak form of efficiency, stock prices are assumed to reflect any information that may be contained in the past history of the stock prices. So, if the market is characterized by weak form of efficiency, no one investor or any group of investors should be able to earn over the defined period of time abnormal rates of return by using information about historical prices available for them and by using technical analysis. Prices will respond to news, but if this news is random then price changes will also be random.

Under the semi-strong form of efficiency, all publicly

available information is presumed to be reflected in stocks' prices. This information includes information in the stock price series as well as information in the firm's financial reports, the reports of competing firms, announced information relating to the state of the economy and any other publicly available information, relevant to the valuation of the firm. Note that the market with a semi strong form of efficiency encompasses the weak form of the hypothesis because the historical market data are part of the larger set of all publicly available information. If the market is characterized by semi-strong form of efficiency, no one investor or any group of investors should be able to earn over the defined period of time abnormal rates of return by using information about historical prices and publicly available fundamental information(such as financial statements) and fundamental analysis.

The strong form of efficiency, which asserts that stock prices fully reflect all information including private or inside information, as well as that which is publicly available. This form takes the notion of market efficiency to the ultimate extreme. Under this form of market efficiency securities' prices quickly adjust to reflect both the inside and public information. If the market is characterized by strong form of efficiency, no one investor or any group of investors should be able to earn over the defined period of time abnormal rates of return by using all information available for them. The validity of the market efficiency hypothesis whichever form is of great importance to the investors because it determines whether anyone can outperform the market, or whether the successful investing is all about luck. Efficient market hypothesis does not require behaving rationally, only that in response to information there will be a sufficiently large random reaction that an excess profit cannot be made.

The concept of the market efficiency now is criticized by some market analysts and participants by stating that no one market can be fully efficient as some irrational behavior of investors in the market occurs which is more based on their emotions and other psychological factors than on the information. But, at the same time, it can be shown that the efficient market can exist, if in the real markets following events occur: a large number of rational, profit maximizing investors exist who are actively and continuously analyzing valuing and trading securities; information is widely available to market participants at the same time and without or very small cost; Information is generated in a random walk manner and can be treated as independent; and investors react to the new information quickly and fully, though causing market prices to adjust accordingly.

2.1.2. Performance of insurance companies

Performance is mostly used as a general wording which involves productivity and efficiency. Performance represents a very general description and could be described as the degree of success which the business has attained in a given period. In other words, performance is a qualitative and quantitative narration of where an individual or a group or an enterprise that is on a work has been able to reach on the way to the goal aimed at, which is related to that work (Ramanathan, 2003) ^[36]. Favourable performance of insurance company reflects the effective business model and investment environment of the company as well as the effectiveness of governmental policies. Many indicators have been utilized for measuring performance of an insurance company, such as gross premium income, return on

investment, growth rate, turnover rate, and even stock market index. Weng (2009)^[40] proposed technological innovation as part of performance including product innovation performance and process innovation performance which mainly measures research and development expenses, new product listing ratio, product cost reduction or profit creation. Kang and Liao (2009)^[22] pointed out the indicators for measuring the performance of an enterprise being return on investment, growth rate, turnover rate, liquidity ratio and risk diversification capacity where the higher return on investment, growth rate, turnover rate, and liquidity ratio presented the better performance of an enterprise while the risks should be the smaller the better evaluated the performance of an industry with revenue, stability and operating capacity where the major evaluation indicators focused on earning power, productivity, and management performance, covering profit rate, net profit margin, gearing ratio, total asset turnover rate, and employee productivity. Chen and Lee (2012)^[9] measured performance with earnings per share, sales growth rate and yield rate. Chiu (2010)^[10] evaluated the investment strategies and performance of enterprises in Taiwan with sales growth rate, profit rate and employee turnover rate. Performance is considered as an effectiveness indicator especially as it relates to competitiveness of an enterprise (Hu & Shieh, 2013)^[19]. This study used gross premium growth rate as indicator for performance of insurance companies.

2.1.3. Concept of monetary policy

The phrase monetary policy from the CBN discharge on monetary policy concept (2006) is seen as any guiding principle premeditated by the Federal Government through the CBN to manage availability of cost and credit supply. It can also be known as the parameter of monetary supply as well as interest rate by the CBN in a way to regulate inflation and to steady the flow of currency in any given economy. Conversely, in the CBN Series No. 97/03 June 1997, Monetary policy was further described as the blend of actions premeditated to control the worth, supply rate of money within a financial system in line with the projected point of activities within the economy. It means that the surplus supply of money would lead to more requests for goods and services that may result to increase in prices and determination of balance of payment position. Monetary policy is one of the existing instruments of macroeconomic objectives. The principal goals of macroeconomic policy are price stability, external stability and a suitable growth rate.

2.1.4. Overview of Nigerian stock market

Recent studies are of the view that the liquidity of stock market is a channel for long-term growth obtainable in advancing economies (Afolabi, 2015)^[3]. A stock market, devoid of liquidity will hinder a lot of lucrative investments that requires long-term funding from being carried out because most investors would be reluctant and indisposed to commit their funds for longer time periods. Contrary, liquid equity markets enable investors to get rid of their shares when the need arises in so doing allowing organizations to increase capital on suitable terms that is equity in nature. By enhancing longer term, additional, cost-effective investment projects, liquid markets improve the distribution of capital and augments projection to grow the economy for long-term period. Capital market is a well-structured market that offers services to increase long-term loans in order to fund, expand

and modernize industries. It is also set up to offer a stage where capital suppliers can speedily and simply refurbish their liquidities. Capital market aids the drive of mobilizing capital as well as allocating the financial resources of the country within numerous battling customers for different uses. The important roles executed by the capital markets are catalysts for rapid economic development and growth. This was the purpose and reason for setting up the NSE in March in the year 1960 as Stock Exchange of Lagos.

Stock exchange in Nigeria controls the market responsible for the purchases and sales of stocks, Government bonds and debentures and they are all referred to as securities. Akin to otherworld stock exchanges, are two major markets within the NSE. This includes the primary as well as the secondary markets. The primary market is also referred to as the new issue market, where initial capitals are raised. The Government and entrepreneurs were capable enough to get loans long enough to fund developmental plans and growth of industries amongst others via the primary markets. This segment of the market under the NSE has huge effect on the Nation's economy. This tells that Nigeria's nascent industrialists and entrepreneurs may perhaps have no well-structured market where they might get loans for long term investment plans.

Consequently, the mobilization of funds for long term productive uses in the economy might have been very hard excluding NSE market. Secondary markets under NSE are saddled with the responsibilities of the purchases as well as the sales of existing instruments. NSE via the market segment makes available the opportunity of refurbishing liquidity to the investors as well as permitting the spreading of risks in an effective and efficient manner. Where, those who access such funds like the Government and entrepreneurs keep hold of the financial resources in their investment projects. Exchange actions via these means make available the task of gathering together savings from the those who are willing and are able to save and allocating them to those who are in need of such funds. For this reason, larger percentage of the financial resources goes to those investment projects that have the highest returns given a certain level of risks. This distribution role of the Nigerian Stock Exchange is important in shaping growth generally as well as good organization of the economy of Nigeria. If funds available are not readily made to the economic units with high demand, proficient in productivity at the suitable point in time period, the growth pace of the economy and development would certainly slow (Alile, 1996)^[5]. The NSE accordingly turn out to be the trademark of the capital market of Nigeria, thus NSE are often used in place of capital market.

2.2. Theoretical Framework

This study is grounded on the theory of information asymmetry as discussed below:

2.2.1. Theory of Information Asymmetry

The economic theory of asymmetric information was developed in 1970 by George A. Akerlof as a plausible explanation for market failures. The theory proposes that an imbalance of information between buyers and sellers can lead to market failure. Market failure, to economists, means an inefficient distribution of goods and services in a free market, in which prices are determined by the law of supply and demand. Asymmetric information theory suggests that sellers may possess more information than buyers, skewing the price

of goods sold. The theory argues that low-quality and high-quality products can command the same price, given a lack of information on the buyer's side. Others argue that ignorance of the facts is not a given, as wary buyers have access to information on demand. It was Stiglitz (2002)^[38], however, who brought information asymmetry to mainstream acceptance. Using a theory of market screening, he authored or co-authored several papers, including significant work on asymmetry in the insurance markets. Through Stiglitz's work, asymmetric information was placed into contained general equilibrium models to describe negative externalities that price out the bottom of markets. For instance, the health insurance premium needed to cover high-risk individuals causes all premiums to rise, forcing low-risk individuals away from their preferred insurance policies. Other economists, such as Bryan Caplan (2004)^[8] pointed out that not everyone is truly in the dark in real markets. Insurance companies, for example aggressively seek underwriting services. Caplan also suggests that models based on the ignorance of one party are flawed, given the availability of information from third parties such as Consumer Reports, Underwriters Laboratory, the credit bureaus among others. Economist Robert Murphy (2010)^[30] suggests that government intervention can prevent prices from accurately reflecting known information, which can cause market failure. For example, a car insurance company might be forced to raise all premiums equally if it cannot base its price decisions on an applicant's gender, age, or driving history. To establish the link between information asymmetry theory and market efficiency, there is need to understand that information asymmetry is a condition wherein one party in a relationship has more or better information than another (Akerlof, 1970)^[4]. A stock market is said to be efficient if it fully and correctly reflects all relevant information in determining insurance stock prices. On the contrary, if the insurance stock prices would be unaffected by revealing that information to all participants, then information asymmetry becomes insignificant in the market but if the insurance stock prices would be affected by not revealing all relevant information to all participants, then information asymmetry becomes significant in the market for efficiency. This is the extent of the relevance of this theory to the study. Moreover, efficiency with respect to information set, implies that it is impossible to make economic profits by trading on the basis of that information set.

2.3. Empirical Literature

Ogieva & Omorogbe (2017)^[32] conducted a study on measuring the efficiency and performance of quoted insurance companies in Nigeria. The study employs the input oriented data envelopment analysis (DEA) model with four input and output variables. These variables were used for the analysis with the aid of input oriented DEAP version 2.1 with variable return to scale assumption using multi stage DEA approach. The result revealed that quoted insurance companies in Nigeria are relatively inefficient. Only seven companies are technically efficient as the result indicates a mean variable returns to scale technical efficiency score of 59%. On the other hand, we observed that twenty-six companies were scale efficient with a mean scale efficiency score of 87% showing that quoted insurance companies are relatively efficient in their choice of scale or size of operations and that Standard Trust Assurance Company (STACO) has the highest peer count. We also discovered the

presence of high slacks for management expenses, net profit, shareholders fund and total asset and this shows the degree of inefficient allocation of resources in the Nigerian quoted insurance companies. On the other hand, the output fall (slack) mean of investment income, net claims, profit after tax and market share indicate what the companies would have achieved if the input variables were properly allocated. Finally, we observed that there is no total factor productivity increase in Nigerian quoted insurance companies as only 7 (seven) firms out of thirty-four recorded varying degrees of productivity progress.

Otal (2018)^[34] investigated the trend of the performance of insurance sector and the implication of liquidity management on their performance between 2000 and 2008. Seven non-life insurance companies were used for the analysis, descriptive statistics and panel data analysis were used to analyze the data. The results show that while all the performance indicators such as profit after tax return on asset, return on equity among others have been following rising trends over the years; liquid asset volume has been following a falling trend. The panel data results show that liquidity does not have significant impact on the performance of insurance companies.

Frank (2018)^[15] empirically appraised the Nigerian insurance sector and the performance of Nigerian stock exchange. Using an ex-post facto research design and a historical data, the study covered the period 1981 to 2014 and covered all the quoted insurance firms on the Nigerian Stock Exchange operating in Nigeria. The findings reveal that there is a significant relationship between insurance companies' investments and the all share index of the Nigerian Stock Exchange, also there is no positive effect of stock/securities prices of insurance companies on market capitalization of the stock market and that Insurance sector growth has significant influence on the performance of Nigerian Stock Exchange. Among authors that posit positive relation between stock market capitalization and economic growth were Ujunwa & Salami (2010)^[39], Nurudeen (2009) among others. These studies posited that the size of the stock market determines the ability of the market to mobilize savings, improve the quality and quantity of investment and accelerate economic growth. Nurudeen (2009)^[31], for instance, investigated whether stock market development raises economic growth in Nigeria, by employing the error correction approach. The econometric results indicate that stock market development (market capitalization-GDP ratio) increases economic growth. The study then recommended the removal of impediments to stock market development which include tax, legal, and regulatory barriers; development of the nation's infrastructure to create an enabling environment for where business can thrive; employment of policies that will increase the productivity and efficiency of firms as well encourage them to access capital on the stock market; enhancement of the capacity of the Nigeria Security and Exchange Commission to facilitate the growth of the stock market, restore the confidence of stock market participants and safeguard the interest of shareholders by checking sharp practices of market operators (particularly speculators).

Adjasi & Biekpe (2006)^[2] used the same Ordinary Least Square method to examine the link between market capitalization and economic growth and development respectively. The findings from both studies were consistent. They found that market capitalization catalyses economic development in Nigeria. Their results show that there is a

positive link between market capitalization (normalized for the level of GDP) and future economic growth. They posited that the link between capitalization and growth could be as a result of the ability of efficient markets to incorporate anticipated future growth into current period prices and thereby exert an increase in market capitalization. They further claimed that this link existed even more strongly within higher income countries. Therefore countries with more developed financial markets are expected to be more efficient and, better able to incorporate anticipated future growth into current prices.

Adenuga (2010)^[1] used quarterly data (1990:q1 to 2009:q4) to examine in Nigeria on the vector error correction approach. The indicator of market size (MCR) used to capture stock market development in Nigeria was found to be positively related to economic growth and significant. They posited therefore that stock market development (through the influence of market capitalization ratio) promotes/supports economic growth in Nigeria. The test is consistent with the findings of Levine and Zervos (1998)^[26].

In the words of Levine (1991, 1997)^[24, 25], without a liquid stock market, many profitable long-term investments would not be undertaken because savers may be reluctant to tie up their investments for long periods of time. The stock market mainly provides liquidity by enabling firms to raise funds through the sale of securities with relative ease and speed. Through this catalyst role, the stock market is also able to influence investment and economic growth in general. Large stock markets lower the cost of mobilizing savings, facilitating investments in the most productive technologies. The empirical evidence by Levine (1997)^[25] supports the belief that greater stock market liquidity boosts (or at least precedes) economic growth. As asserted, without liquid capital market there would be no industrial revolution. This is because savers would be less willing to invest in large, long-term projects that characterized the early phase of industrial revolution.

In Nigeria, Liquidity-Growth empirical literatures are correctly used with divergent views measured stock market liquidity by the total value of shares traded at the stock exchange as a share of the GDP claimed a link between stock market liquidity and economic growth; but succinctly asserted that liquidity varies with the relative ease of trading. A study with the help of Ordinary least squares regression (OLS) on data from 1989 to 2008 revealed a positive relationship such that an increase in value traded ratio led to 1.85 percent increases in growth rate of the GDP was found. Recent empirical studies on liquidity-growth which support the positive impact argument include Josiah, Adedinran & Akipet (2012)^[21] which carried out a time series analysis with data collected from the Central bank Statistical bulletin from the period of 1992 to 2007 on the Ordinary Least Square and Cochrane-Orcutt iterative methods. Using value of transaction and number of deals to measure stock market liquidity, the study found that both variables were positively correlated to GDP both in the least square and the Cochrane-orcutt methods. The implication s of the findings was that the volume of transactions in the capital market has contributed positively to the development of the Nigerian economy and that the deals in the capital market have not made positive impact on the GDP.

Ujunwa & Salami (2010)^[39] rejected that argument that stock market liquidity has positive impact on economic growth. The employed the Ordinary Least Square regression on time

serial data for 21-year period: 1986 – 2006 and found that market liquidity (Value traded ratio) was negatively related to economic growth. This result was explained as caused by the higher degree of price volatility on stock markets which reduced the efficiency of price signals in allocating investment resource in Nigeria. The findings were that the regressions coefficient for turnover ratio is positive in explaining economic growth. They posited it to conform to the preposition that developing stock markets allows savers to sell their shares easily if they so desire, thereby making shares a relatively more attractive investments.

Yeh and Lee (2000)^[41] examined the volatility in the China stock market using TGARCH model with data from May 22, 1992 to August 27, 1996 and found that volatility responds more to positive shocks than negative shock in the China market, which led investors in China's stock market to be more interested in good news than bad news.

Also, Jingli and Sheng (2011)^[20] examines the stock market volatility of Shanghai Composite Index and Shenzhen Stock Index from 30th July, 2003 to 30th July, 2010 using ARIMAEARCH- M (1, 1) and ARIMA-TARCH-M (1, 1) models. The result shows that the indices in both markets have the character of clustering, asymmetry, fat tail and leverage effect returns.

Hou (2013)^[18] estimated the volatility of daily closing prices of two Chinese primary indices; Shanghai stock exchange composite index (SHCI) and Shenzhen stock exchange component index (SZCI) from 2nd Jan. 1997 to 31st Aug. 2007 using the generalized additive non-parametric smoothing technique. The researcher ascertained that an asymmetric effect of negative news exist in the Chinese stock market which have impact on return volatility. Also, the effect is higher in Shanghai composite index than the Shenzhen composite index.

In the American market, Pan and Hsueh (1998)^[35] analysed the movements in return and volatility between future prices of US S&P 500 and Japan Nikkei 225 stock indices, using 2-step GARCH model. The result revealed that there is a unidirectional spillover and a major lagged volatility from US to Japan.

Furthermore, the US market is four times influential on Japans' returns compares the US stock market volatility returns with stock market returns in UK, Germany, Japan, Australia and Canada after the 1987 stock market crash using the monthly, daily and intra-day intervals of the indices. This analysis shows that stock volatility has been low and stable in these markets, but Japan had high return volatility and decrease in stock value in 1990.

Using the GARCH and TGARCH models, Onyeaso and Roger (2004)^[33] determined the stock volatility movements and predictions in the small cap (SC) 600 index from 3rd January, 1995 to 19th August, 2002. The results show that the volatility of the index was predictable and the index does not have the same behaviour observed in other stocks.

In some of the studies carried out in Europe, Guidi (2008)^[16] used GARCH family models to determine the volatility, long term relationship and variance in German, Swiss and UK stock market indices. The result of the GARCH family shows evidence of asymmetric effects on the returns volatility.

Kiymaz and Berument (2003)^[23] ascertained the daily effect of stock market volatility and volume of Germany, Canada, Japan, U.K and U.S.A, using the conditional variance method with data from 1st January, 1988 to 28th June, 2002. The result shows that there is an effect of the day of week on both

returns and volatility.

3. Methodology

An ex post facto research design was employed in the study. The research covers the activities of 19 insurance companies that are listed on the Nigerian Stock Exchange. The population of the study consisted of all insurance companies quoted on the Nigerian stock exchange as at December 31, 2022. An analysis of the website of the Nigerian Stock Exchange (NSE) showed that 21 insurance companies were listed on the main board of the NSE. Hence the population of this study consists of 21 insurance companies listed on the main board of the NSE as at December 31, 2022. The 19 selected insurance companies that were purposively sampled for the study were AIICO Insurance PLC, AXA Mansard Insurance PLC, Consolidated Hallmark Insurance PLC, Cornerstone Insurance PLC, Coronation Insurance PLC, Custodian Investment PLC, Guinea Insurance PLC, International Energy Insurance Co. PLC, Lasaco Assurance PLC, Linkage Assurance PLC, Mutual Benefits Assurance PLC, N.E.M. Insurance PLC, Prestige Assurance PLC, Regency Assurance PLC, Sovereign Trust Insurance PLC, Sunu Assurances Nigeria PLC, Royal Exchange PLC, Universal Insurance Co. PLC and Veritas Kapital Assurance PLC. The data sample of the study comprises of daily stock prices data of 19 listed insurance companies for the period January 4, 2022 December 30, 2022. The dependent variable is gross premium income growth rate. The independent variable is the stock price movements of the insurance companies while the control variable in the monetary policy rate.

Fama-French three factor coefficient estimates obtained from quantile regression was used to test the hypothesis. Empirically, Fama-French three factor model quantile regression estimates give a more comprehensive and clearer picture of the varying effect of predictors on response variables to analysts or investors in making investment decisions introduced quantile regression, which is based on the conditional quantile functions. Quantile regression estimates the conditional median or the conditional quartile of the dependent variables for the given independent variables. The quantile regression coefficients of the independent variables denote the changes in the specified quantile from one unit changes of the associated predictor variables. Quantile regression is more robust in nature and is able to capture outliers effectively. In quantile regression, the conditional median function is estimated by the median estimator that reduces the sum of absolute errors. The study adopts the quantile regression technique used by previous authors such as to specify the relationship between the variables in the hypothesis of the study.

3.1. Efficient Market Model Specification

In traditional theory of finance there is efficient market assumed by Fama (1970) ^[14]. On such market, there is no space for active investment strategy, because there are no overpriced or under-priced stocks. This theory state that models are based on rational behaviour of investors, which make a good estimation of market prices. In this case, all price volatilities are caused by past events (Minović, 2013) ^[29]. Fama (1970) ^[14] formulated Efficient Market Hypothesis (EMH) as follows: only prices and data from the past determine in total current market prices; current prices are memory-free and they are independent and equally

distributed among securities (weak form); all information available in public determine in total current market prices (semi-strong form); all information, including insider information, determines current market prices (strong form) (Hoguet, 2005) ^[17].

According to Fama's (1970) ^[14] theory, market is considered efficient according to given set of information if there is no ability to make abnormal profit with trading based on this information. Thus, it's impossible to make abnormal profit with trading based on publicly available information. Fama (1970) ^[14] provides mathematical model as:

$$E(P_j, t + 1 | \zeta_t) = 0 \quad (3.1)$$

Where; $P_j, t + 1$ represents difference between real price of security j in moment $t+1$ and their expected price based on given information set ζ_t . If expectation, given by formula (3.1), is equal to zero means that there is no chance for investor to beat up market, and that there is no under or overestimated securities in moment t . In this case, we can consider stochastic process $P_j, t + 1$ as a fair game (Andrikopoulos, 2007) ^[7]. Real abnormal profit is given as difference between real price of security j in moment $t+1$ and expected price for same security based on available information set, or

$$pj, t + 1 = Pj, t + 1 - E(Pj, t + 1 | \zeta_t)$$

where $Pj, t + 1$ is price of security j in moment $t+1$, and E is expectation operator. Fama's (1970) ^[14] efficiency theory describe that information flows only influence on current prices and that market prices reflect best fundamental values of their basic assets. This theory implied existence of stochastic process with independent, equally distributed binomial randomised variables, known as random walk (Andrikopoulos, 2007) ^[7].

In the world of classic finance, there is no prize for investors for holding anything but market portfolio. This is based on assumption that investors have rational expectations and that market efficiently aggregate information, where an equilibrium price involves all available information. Price is equal to value of security in the moment of trading, because all available information are discounted and involved in price (Hoguet, 2005) ^[17]. Some of these assumptions are very unrealistic, for example assumptions about total rationality of investors, symmetry of information, homogenous expectation, etc. There is phenomenon in reality which can easily invalidate assumptions given in models of classical finance. Beside, some empirical studies provide totally opposite projections according to analytical models, based on before mentioned assumptions (Martinez-Jaramillo, 2007) ^[28]. Amihud, *et al.* (2005) ^[6] state that classic theory of asset pricing without arbitrage stand on assumption of liquid markets. Literature dealing with liquidity implies that there is not such a thing as totally liquid market, but neither that nor all investors have same information nor they are all active on market all the time (Amihud, *et al.*, 2005) ^[6].

Empirical testing of EMH theory is problematic. But, empirical evidences against market efficiency and theoretical linear relation between risk and expected return can be enough to eliminate assumptions needed for classical theories. Literature related to basic anomalies of market is one of major challenges in modern finance research and provide an opportunity of escalation of new research area,

such as behavioural finance (Andrikopoulos, 2007)^[7]. Based on the above Fama's efficient market model, our study uses Fama-French three factor quantile regression model as: $R_{Pt} - R_{Ft} = a + b (R_{Mt} - R_{Ft}) + s SMB_t + l LMH_t + e_t$

Where,

SMB mimics the risk factor in insurance stock prices; LMH mimics the risk factor in returns considering value s and l are the portfolio's responsiveness to (sensitivity coefficients) SMB and LMH factors, respectively. We used Small Minus Big (SMB) and Low Minus High (LMH) in Fama French three factor (FFTF) regression (Sehgal *et al.*, 2012; and others) are mimicking portfolios for stock prices and value factors, respectively. Mimicking portfolios are constructed using the Fama-French (1993)^[12] methodology. The equation is linearized in a quantile regression model as:

$$GPGR_t = \beta_0 + \beta_1 ISPM_t + \beta_2 MPRA_t + \epsilon_t$$

Where; GPGR= gross premium income growth rate (dependent variable); ISPM = stock price movements (independent variable) and MPR = monetary policy rate (control variable).

4. Empirical Results

4.1.1. Descriptive Statistics

Table 4.1 shows that GPGR has a mean score of 21.6 with a

standard deviation of 12.3, showing that the deviation from the mean is below the mean hence; the data are clustered below the mean. Thus, indicating lower disparity in performance of insurance companies in Nigeria in 2022. It further shows that ISPM has a standard deviation of 1.05 lower than the mean score of 1.21, indicating low level of disparity in insurance stock prices from January to December, 2022.

Table 1: Descriptive statistics analysis result

	GPGR	ISPM	MPRA
Mean	21.61587	1.215197	14.69625
Median	19.69000	0.520000	14.00000
Maximum	58.00000	8.000000	15.50000
Minimum	6.000000	0.200000	14.00000
Std. Dev.	12.26977	1.058710	0.748169
Skewness	1.369558	2.332108	0.143711
Kurtosis	4.762018	7.418144	1.020653
Jarque-Bera	1695.868	6598.824	639.5682
Probability	0.000000	0.000000	0.000000
Sum	82940.08	4662.710	56389.50
Sum Sq. Dev.	577499.7	11864.98	2147.226
Observations	3837	3837	3837

4.1.2. Simple Correlation Matrix

Table 2 revealed that ISPM and MPRA correlated negatively with GPGR.

Table 2: Bivariate Correlation among variables

		GPGR	ISPM	MPRA
GPGR	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	3837		
ISPM	Pearson Correlation	-.252**	1	
	Sig. (2-tailed)	.000		
	N	3837	3837	
MPRA	Pearson Correlation	-.019	.008	1
	Sig. (2-tailed)	.236	.631	
	N	3837	3837	3837

**. Correlation is significant at the 0.01 level (2-tailed).

4.2. Testing of Research Hypothesis

The researchers employed Fama-French three factor quantile regression model to analyse the data and test the hypothesis developed for this study. The hypothesis was that there is no significant relationship between the insurance stock price movement and the performance of insurance companies in Nigeria. The empirical results presented in Table 4.3 revealed a negative coefficient of -1.138037 with p-value of 0.000 for ISPM, the finding is that there is a significant relationship between the insurance stock price movement and the performance of insurance companies in Nigeria, and such relationship is negative. Thus, the researchers found no sufficient evidence to support the null hypothesis. The quantile regression results indicate that insurance stock price movement has significant impact on the performance of insurance companies at 0.05 quantile. The R^2 value of 0.529 is strong; It means that the variables in the model combined together explained about 53% variations in the performance of insurance companies while 47% of the variations are explained by variables not included in the model. The implications of the above quantile regression results is that insurance stock analysts and investors get much more information about the varying effect of predictor variables

such as the insurance stock price movement and the performance indicator. Hence, investors can mitigate their investment associated risks significantly.

On the suitability of the model and reliability of the parameters returned by the model, the model diagnostic analysis was performed for multi-collinearity, autocorrelation, heteroskedasticity, and stability checks. As presented in Appendix, the results showed no presence of any of these problems. For Multi-collinearity, the VIF indicate values less than 2 which is within the acceptable threshold of 5. The Breusch-Godfrey Serial Correlation LM Test was further conducted; it showed F-statistic value of 1.871041 with p-value of 0.1076 which is greater than 0.05, meaning that there is no autocorrelation problem, Also, for the heteroskedasticity Test: White revealed an F-statistic value of 1.172805 with p-value of 0.1284 which is insignificant as it is greater than 0.05, meaning there is no heteroskedasticity problem. Finally, on the stability of the model, figures in Appendix show the quantile process estimate and the recursive estimate test graphs which help in tracing out the stability of model during the period of estimation. The null hypothesis is that the quantile regression model fits the data well versus its alternative hypothesis of an invalid quantile

regression model. The smooth blue lines show the residual errors and the dotted lines indicated 5% Bartlett standard error bound. It can be seen clearly that the blue line did not move outside the bound, hence the null hypothesis that the

quantile regression model fits the data well is accepted and hence the parameter estimate in this model are stable over time. In all, the result can be considered valid and reliable for both policy decision and predictive analysis.

Table 3: Fama-French three factor quantile regression output

Dependent Variable: GPGR				
Method: Quantile Regression (Median)				
Date: 08/18/23 Time: 07:34				
Sample: 1 3837				
Included observations: 3837				
Huber Sandwich Standard Errors & Covariance				
Sparsity method: Kernel (Epanechnikov) using residuals				
Bandwidth method: Hall-Sheather, bw=0.062059				
Estimation successfully identifies unique optimal solution				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	24.71254	3.367331	7.338910	0.0000
ISPM	-1.138037	0.039648	-28.70349	0.0000
MPRA	-0.303476	0.226153	-1.341908	0.1797
Pseudo R-squared	0.529502	Mean dependent var		21.61587
Adjusted R-squared	0.428996	S.D. dependent var		12.26977
S.E. of regression	12.23774	Objective		16111.12
Quantile dependent var	19.69000	Restr. objective		16600.88
Sparsity	20.90578	Quasi-LR statistic		187.4161
Prob (Quasi-LR stat)	0.000000			

4.3. Discussion of Findings

The study analyzed the performance of insurance companies and the insurance stock price movement in Nigeria using Fama's model of efficient market approach. The finding revealed that there is a significant relationship between the insurance stock price movement and the performance of insurance companies in Nigeria, and that such relationship is negative. The negative coefficient of -1.138037 for insurance stock price movement implies that 1.138% declined in the performance of insurance companies is attributable to insurance stock prices volatility. Although the study variables differ, this finding of this study is close to the finding of Frank (2018) ^[15] that there is a significant relationship between insurance companies' investments and the all share index of the Nigerian Stock Exchange, also there is no positive effect of stock/securities prices of insurance companies on market capitalization of the stock market and that Insurance sector growth has significant influence on the performance of Nigerian Stock Exchange.

5.1. Conclusion and Recommendations

The study sought to analyze the performance of insurance companies and the insurance stock price movement in Nigeria using Fama's model of efficient market approach. This involved examining the model's predictions and statistical significance of the explanatory variable; the insurance stock price movement. Furthermore, mimicking portfolios model was constructed using the Fama-French (1993) ^[12] methodology. Lastly, the study employed Fama-

French three factor quantile regression model. The study found that that there is a significant relationship between the insurance stock price movement and the performance of insurance companies in Nigeria, and that such relationship is negative. The results also suggested the presence of other factors other than the ones proposed by Fama and French and the variables used in the study. This is observable in the 0.529 value of R-squared (R2), which explained that about 47% of the variations in the performance of insurance companies in Nigeria are explained by variables not included in the model. The study arrived at various policy recommendations. First, there should be perfect information about stock market forces of demand and supply because if there is information asymmetry through which borrowers (securities issuers) know more about the risks than the lenders to (securities purchasers), the market participants may be reluctant to trade with insurance stocks, whose characteristics and behaviour under varying economic conditions are not well known. Also, it is important for the regulator in formulating policies that encourage diversification of investments. Insurance companies use the stock market to gauge the perception of the public towards them. When the concentration of trade is rewarded with high returns, it may deter companies from listing. This may occur when the insurance company is not certain of how its stock will perform on the market. Trade concentration may therefore prove to be a disincentive for firms considering to list on NSE. Insurance companies stocks should be valued using the method that yields the highest explanatory power.

6. Appendices

Variance Inflation Factors			
Date: 08/18/23 Time: 07:57			
Sample: 1 3837			
Included observations: 3837			
Variable	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
C	14.23351	387.2366	NA
ISPM	0.011887	1.477638	1.000060
MPRA	0.065686	1.869696	1.000060
Heteroskedasticity Test: White			
F-statistic	1.172805	Prob. F(4,3832)	0.1284
Obs*R-squared	4.185003	Prob. Chi-Square(4)	0.2856
Scaled explained SS	7.399216	Prob. Chi-Square(4)	0.3848
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.871041	Prob. F(2,3832)	0.1076
Obs*R-squared	3.798106	Prob. Chi-Square(2)	0.1395

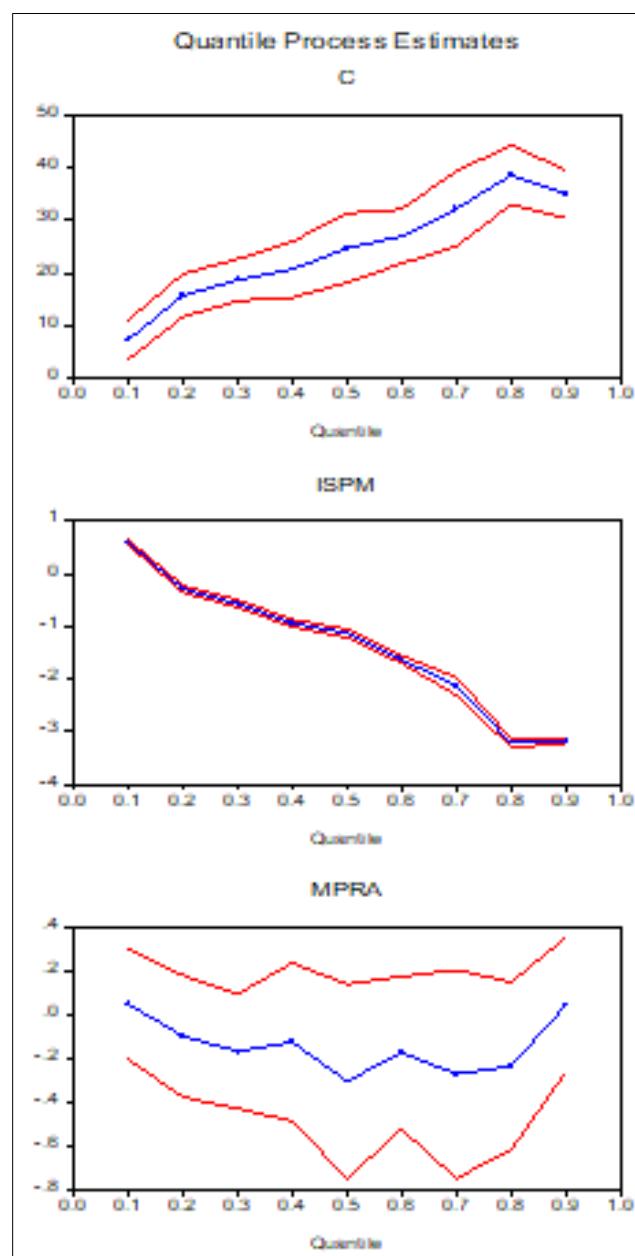


Fig 1: Variance Inflation Factors

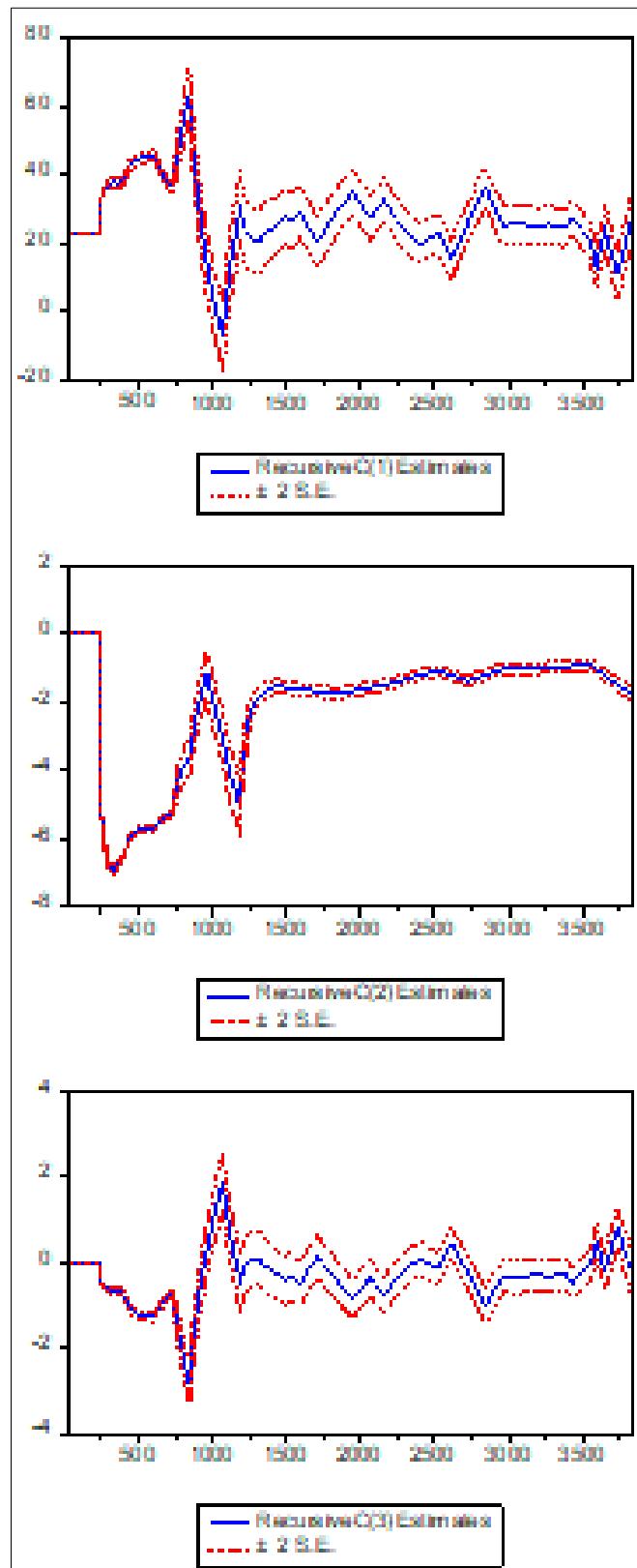


Fig 1: Breusch-Godfrey Serial Correlation LM Test

Conclusion

Study employed Fama's efficient market model to analyze the relationship between insurance companies' performance and stock price movements in Nigeria. The findings indicate a significant negative correlation, suggesting that fluctuations in insurance stock prices detrimentally affect company performance. This aligns closely with previous research by Frank (2018) regarding the Nigerian Stock Exchange.

Despite the study's robust methodology, the modest R-squared value of 0.529 suggests that nearly half of the variation in insurance company performance remains unexplained by the variables examined. Consequently, policy recommendations emphasize the need for transparent market information and diversified investment policies to mitigate risks associated with stock market volatility in the insurance sector.

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