

Market Risk and Firm Financial Performance of Agricultural and Oil and Gas Firms in Nigeria

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Abstract

The study examined the effect of market risk on financial performance of agricultural and oil and gas firms in Nigeria. The independent variables of this study are foreign exchange risk, equity price change, interest rate risk and commodity price change and dependent variable is return on investment. The study adopted Ex-post facto research design. The population of this study consists of 23 listed agriculture and oil and gas firms in Nigeria Exchange group as at 31st December, 2022. The study used 14 companies as sample size out of the total population. The study used secondary data, secondary data used were collected from annual financial reports of the sampled companies for eleven years period spanning from 2012-2022. Robust Random Effect Model was developed to test the effect between dependent and independent variables. It was operated using EVIEWS 9. The results of the Robust Random Effect Model revealed that, Foreign exchange rate change has a positive significant effect on the financial performance (ROI) of sampled firms in the Nigerian exchange group ($P < .5$), Equity price change has a positive significant effect on the financial performance (ROI) of sampled firms in the Nigerian exchange group ($P < .5$), Interest rate change has a negative insignificant effect on firm performance (ROI) of sampled firms in the Nigerian exchange group. ($P > .5$) and Commodity price change has a negative significant effect on the performance (ROI) of sampled firms in the Nigerian exchange group. ($P < .5$). The study concluded that the financial performance (ROI) of the targeted firms is largely determined by rise in Foreign exchange rate change and Equity price and fall in commodity price change. The study

recommended that, the relevant authorities should adequately put measures to safeguard the value of the domestic currency, the targeted firms should as a matter of urgency trade with caution when considering investment in fixed income securities due to high interest charges, The apex bank (CBN) should among others seek for a favourable and more stable interest rate to a point that it could be attractive to foreign and local investors as it is an indicator of a stable economy and The authorities should also pay attention to the effect of commodity prices. This can be achieved by ensuring that, the constant rise in the prices of commodities are hedged.

Keywords: *Market risk, Foreign Exchange Risk, Interest Rate Risk, Equity Change Risk and Commodity Risk*

1.0 Introduction

Risk is defined as anything that can create hindrances in the way of achievement of certain objectives. It can be because of either internal factors or external factors, depending upon the type of risk that exists within a particular situation. Risk is a doubt or indecision of an outcome that has an adverse impact on the achievement of organizations objectives. It includes an opportunity as well as a threat. Paulinus and Jones (2017) stressed that risk is a probability, threat and negative occurrence caused by outsider or insider weaknesses that can be circumvented through proactive action. Managing risk is one of the basic tasks to be done, once it has been identified and known. Risk in business is inevitable. Businesses around the world are exposed to different categories of risk ranging from market risk such as interest rate risk, foreign exchange risk, price risk, and other forms of risk as credit risk, liquidity risk, operational risk, and legal risk among others. For any business to perform, it must have to survive all known and unknown risks that surrounds it. Risk in this case means uncertainties. Several risks surround all businesses which include liquidity risk, credit risk, market risk and other types of non-financial risks (Kassi, et'al 2019). Kanchu and Kumar (2013) see risk as anything limiting the achievement of a certain predefined objectives. Some of those risks include financial risks, operating risks and market risks. Market risks being the subject of this study is however, the risk of an entity resulting from movements in market prices which consists changes in interest rates, foreign exchange rates, equity and commodity prices (Muriithi, et'al 2016; Ekinci, 2016). The degree of deepness of market risk as it affects performance of business organizations threw up a rhetorical question on how the risk operates. Market risk particularly is one of the critical components of risk that is non-diversifiable and presents big challenge to all businesses including agricultural sector. Indeed, Market risk is the risk of losses in liquid portfolio arising from the movements in market prices and consisting of interest rate risk, currency risk, equity and commodity risks (Ekinci, 2016). Market risk can create severe losses within a short period of time among volatile market conditions thereby could contribute to collapse among institutions in harsh situations (Odubuasi, et'al 2020). Market risk is the risk that a firm will incur losses because of a change in the price of assets held resulting from changes in interest rate, securities, commodity prices, foreign exchange rate and other market risk factors. Ekinci (2016) upholds that market risk is the risk of losses in liquid portfolio arising from the movements in market prices and consisting of interest rate, foreign currency, equity and commodity price risks. Ekinci (2016) and Namasake (2016) noted that market risk exposure is more volatile than credit risk exposure because of rapid changes in market condition that can cause

severe financial losses and possible collapse. Market risk is regarded as the “risk of loss of shareholder’s fund due to the bank’s financial operation as a result of volatility in prices of equity, interest rates, commodity prices, exchange rates, and other variables.

The need to increase returns has increasingly become one of the primary reasons organizations are constantly under serious pressure to accept a substantial number of risks. These risk exposures are interest, market, operational, reputational, liquidity risks, and so on. The high rate of failures, financial Scandals, as well as the mounting toxic assets, are some of the major issues that have thrown up the debate on the best possible approach to curb losses from the uncertainties in the market in relation to agricultural products. Performance comprises the actual output or results of an organization as measures against its intended output (or goals and objectives). It is one of the most important variables in the field of management research today. Financial performance is a post business operation activity to determine how economically well or profitable the business has done within a particular period. In other words, financial performance is the extent to which financial goals or obligation of a firm is being accomplished. Financial performance is seen as the degree at which the financial objectives of an organization have been achieved. It is a process of measuring the outcomes achieved from how well the firm’s policies and operations have been undertaken expressed in monetary terms (Verma, 2018). Financial performance is an indicator of the business achievements and shows its overall financial health over a specified period of time. It indicates how an entity has carried out maximum utilization of its resources to maximize the shareholder's wealth (Naz et al., 2016). However, since it is obvious that agriculture is the bedrock of economic growth, development and poverty eradication in the developing countries such like Nigeria it becomes imperative therefore to conduct studies on the effect of market risk on financial performance of agricultural sector in Nigeria.

Market risk is among the main problems faced by many companies, especially agricultural firms and those listed on the exchange limited where the valuation of companies depends on market conditions. Several risks common to all businesses including agricultural firms such as liquidity risk, credit risk, capital risk and other types of non-financial risks. In particular, market risk is one of the critical components of financial risk because it is a systematic risk that investors cannot eliminate through a diversified portfolio; Nevertheless, market risk can be reduced by using appropriate hedging strategies. Indeed, market risk is the likelihood that a company (or an investor) suffers losses due to factors that influence the global performance of the financial markets in which it is included. High volatility of market risks have posed a threat to growth and sustainability of businesses around the world and it has called for proper evaluation to be able to proffer solution to secure acceptable market risk appetite that can guarantee increased financial performance. This implies that the financial performance of companies has economic growth consequence.

In recent decade, it was alleged that one of the reasons for low financial performance of agricultural sector is attributed to market risk, hence, the need for further study. Prior literature provides evidence of a positive relationship between market risk and financial performance as follows.

In view of the above, the extant literature reviewed show that authors had done great work on the market risk. In Zambia et’al. (2017) studied the effect of exchange rate, interest rate and commodity price on stock exchange performance In Indonesia, Risman, et’al (2017) studied effect of commodity prices, exchange rate and investment on firms listed. Ekinici (2016) worked on the

effect of credit and market risk on the bank performance in Turkey, and Muriith, et'al (2016) worked on market risks and financial performance of commercial banks in Kenya. Norhafiza, et'al (2014) anchored their study on the impact of commodity prices, interest rate and exchange rate on the stock market performance of Malaysian economy. In Nigeria, Odubuasi, et'al (2020) investigated the effect of market risk on Oil and Gas sector of Nigeria economy; Agubata and Odubuasi (2018), Okereke (2017) and Offiong, et'al (2016) studied the influence of exchange rate changes on manufacturing firms in Nigeria, Nwandu (2016) studied the effect of interest rate, Alao and Oloni (2015) studied the commodity price changes on drink service industry in Nigeria.

The uniqueness of this research over other prior studies is the combination of independent variables such as, foreign exchange risk, book to market value ratio, interest rate risk and degree of financial leverage to investigate the effect of market risk on financial performance of quoted agricultural firms in Nigeria. This therefore, addresses the problem of market risk measurement and presents a holistic measure of firm's financial performance using return on investment which no study has considered to use to measure financial performance as regards to the study of market risk. The study will cover eleven (11) years period spanning from 2012 to 2022. This study seeks to fill the existing research gap by ascertaining the current data and results on the effect of market risk on financial performance of agricultural firms in Nigeria. The main objective of this study is to examine the effect of market risk on financial performance of agricultural firms in Nigeria. The specific objective includes to:

1. Determine the effect of foreign exchange risk on financial performance of listed agricultural and oil and gas firms in Nigeria.
2. Evaluate the effect of equity price change on financial performance of listed agricultural and oil and gas firms in Nigeria.
3. Examine the effect of interest rate risk on financial performance of listed agricultural and oil and gas firms in Nigeria.
4. Investigate the effect of commodity price change on financial performance of listed agricultural and oil and gas firms in Nigeria.

2.0 Literature Review

Market Risk

Market risk is the risk that a firm will incur losses because of a change in the price of assets held resulting from changes in interest rate, securities, commodity prices, foreign exchange rate and other market risk factors. Ekinci (2016) upholds that market risk is the risk of losses in liquid portfolio arising from the movements in market prices and consisting of interest rate, foreign currency, equity and commodity price risks. In the word of Namasake (2016), market risk exposure is more volatile than credit risk exposure because of rapid changes in market condition that can cause severe financial losses and possible collapse. Market risk involves loss resulting from changes in the value of assets and liabilities (including off-balance sheet assets and liabilities) due to fluctuations in risk factors such as interest rates, foreign exchange rates and stock prices

(Sukcharoensin, 2013). In other words, market risk is the probability that the value of an investment will be affected due to changes in market factors such as interest rate, foreign exchange rate, and inflation. Market risk is the risk of loss in liquid portfolio arising from the movements in market prices and consisting of interest rate, currency, equity, and commodity risk. Market risk is the potential loss of value of assets and liabilities arising from movement in market prices (Ghosh, 2012). Market risk are of financial nature which occurs due to fluctuations in the financial market and are caused by a mismatch between the assets and liabilities of a business. The mismatch on compositions of assets and liabilities of any organization will determine the kind of exposure it has to various kinds of market volatilities (Abhay, 2019). Market risk can also be described as the risk of losses in liquid portfolio arising from the movements in market prices. Fluctuations of the market cause losses of income generated from the assets held for investment and lead to the poor financial performance of the organization (Aykut, 2016). Vladimir, Boban, and Boris (2013) noted that market risk variables comprising of equity risk, interest rate risk, foreign exchange risk and commodity risk cause losses on firms' balance and off-balance sheet items in banks in Serbia. During the time of extremes economic crisis, the effect of market risk causes investors to lose both money and assets invested in the firm. Muathe (2017) noted that organization must keep previous records about risks to enable them to forecast future risks. Financial distress affects financial performance of organization therefore keeping informed of various risks reduces the risk of poor performance. Firm must employs contingent measures to reduce financial risks and improves the organizational performance. Ahmet (2016) found that market risk affects the financial performance of conventional financial firms more than Islamic financial firms in Turkey. The lower effects in the Islamic financial firms is explained by lower Financial Leverage in the Islamic market due to Sharia screening criteria which put on a cap the upper limit of the bearing the interest-based debts.

Market risk is the risk that changes in market prices, such as foreign exchange rates, interest rates and equity prices and this will affect income or the value of the holdings of financial instruments. The objective of market risk management is to manage and control market risk exposures within acceptable parameters, while maximizing the return (Forte oil Plc, 2018). Market risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices (Japaul oil & maritime services Plc, 2018). Market risks are the risks created by any adverse change in interest rates, exchange rates, share prices and commodity prices (Muriithi, et'al 2016).

Market risk is the possibility that an investor experiences loss due to factors that affect the overall performance of the financial market in which he is involved. Market risk, also called "systematic risk," cannot be eliminated through diversification, although it can be hedged against. Sources of market risk include recession, political turmoil, change in interest rates, natural disasters, and terrorist attacks. Market risk can be defined as the risk of losses on the balance sheet and off-balance sheet positions arising from adverse movements in market prices. From a regulatory perspective, the market risk stems from all the positions included in banks' trading books, as well as from commodity and foreign exchange risk positions in the whole balance sheet (Basel, 2008).

Foreign Exchange Risk

According to Jamal et'al (2014) Exchange risk is a financial risk posed by an exposure to unanticipated changes in the exchange rate between two currencies. Investors and multinational businesses exporting or importing goods and services or making foreign investments throughout the global economy are faced with an exchange rate risk which can have severe financial consequences if not managed appropriately. If foreign exchange markets are efficient such that purchasing power parity, interest rate parity, and the international Fisher effect hold true, a firm or investor does not need to protect against foreign exchange risk due to an indifference toward international investment decisions. A deviation from one or more of the three international parity conditions generally needs to occur for an exposure to foreign exchange risk.

The exchange rate is the price of one country's currency expressed in terms of another country's currency. Exchange rate has been noted to be the product of interaction between the demand for and supply of foreign exchange (Ezejelue, 2008), and in effect, Oladipupo and Onotaniyohuwo (2011) opine that exchange rate movements have ripple effects on the economic activities of a nation. Inevitably, exchange rate serves as the lubricating oil in the international transactions and in that case companies as well as nations get affected either favourably or unfavourably by the swings or fluctuations in exchange rate (Enekwe, et'al, 2013). Agubata and Odubuasi (2018) found exchange rate to have positive effect on performance of manufacturing companies in Nigeria. Foreign exchange volatility, if left unmitigated, can erode the financial gains of a firm. This can reduce the value of money used for transactions and available for investment. There is always the need to monitor the prevailing value of foreign exchange to decide on investment decisions at every point in time in the bank. Improper valuation may result in a huge loss of investment income. This shows that foreign exchange risk arising from foreign exchange volatility can negatively affect the profitability of banks, leading to poor or dwindling performance. Foreign Exchange risk comes about as a disparity between the assets held by a bank and the loans that fund its balance sheet. An unexpected depreciation of the local currency against the USD can dramatically increase the cost of servicing debt relative to revenues.

Foreign exchange exposure is the sensitivity of firms' cash flows, real domestic currency value of assets, liabilities, or operating incomes to unexpected changes in exchange rates (Ahmed, 2015). Foreign exchange exposure is defined as the degree or extent to which a company is affected by exchange rate changes (Muriithi et al, 2016). The magnitude of the gain or loss that results from a particular exchange rate change is transaction exposure, and transaction exposure is a foreign exchange loss or gain on transaction already entered into and denominated in a foreign currency (Muriithi et al., 2016). Foreign exchange risk, also known as currency risk, is more pronounced in businesses that deal with more than one currency in their import and export transactions (Muiru, Kisaka & Kalui, 2018).

Oladipupo and Onotaniyohuwo (2011) say that exchange rate fluctuations have ripple effect on economic activities of a nation and brings to mind the definition giving to exchange rate by Ordu and Nwoha (2013), as the product of interaction between the demand for and supply of foreign exchange. They continued that the fluctuations in exchange rate can have favourable or unfavourable effect on companies' operations. Agubata and Odubuasi (2018) worked on exchange rate fluctuation and firm performance in Nigeria, and found exchange rate to have positive and insignificant effect on firm performance. In Mexico, Flota (2014) found exchange rate to have

significant effect on equity value after investigating the impact of exchange rate movement on firm value in emerging markets. Enekwe, et'al (2013) regressed exchange rate with manufacturing gross domestic product, manufacturing foreign private investment and manufacturing employment rate, they found that exchange rate has significant and positive effect on manufacturing sector. More so, Okereke (2017), Ikechukwu (2016) and Lagat and Nyandema (2016) found statistical significant relationship between foreign exchange rate and firms' performance.

Equity Price Change

Equity capital is a type of capital that a company raises from its owners and other shareholders in exchange for a portion of ownership in the company. A company's capital structure refers to the combination of its various sources of funding. Capital structure is the particular combination of debt and equity used by a company to finance its overall operations and growth. Most companies are funded by a mix of debt and equity, including short-term debt, long-term debt, some shares of common stock, and perhaps shares of preferred stock. Baker and Martin (2011), opined that it is the mixture of debt and equity that the firm employs to finance its productive assets, operations and future growth. It is a direct determinant of the overall costs of capital and contributes to the firm's total level of risk (Dao & Ta, 2020). Equity capital is one of the primary sources through which businesses obtain capital to finance their operations and overall development. Equity capital is not a debt and the company is not liable to repay the fund raised through equity financing. It is generally classified into private and public equity capital.

Equity capital is raised by issuing shares to shareholders. Shareholders are the owners of a business, and bring in capital, take risks and directly or indirectly run the business. Equity capital is an essential component for managing business operations and growth. Equity is different from debt, which is borrowed money that must be repaid with interest. Firms need to effectively manage debt and equity components, where appropriate management of each element affects the profitability of companies (Ehrhardt & Brigham, 2011). There are two sources available to firms to obtain funds. Funds can be assessed by businesses either through internal or external sources. The internal sources of funds consist of reserved incomes, whereas external sources consist of loans from financial institutions, issuing loan stock, and issuing equity shares. Weak capital structure management can result in the creation of poor leverage, and such sub-optimal decisions can eventually lead to business failure (Zada, et'al 2021).

Equity price is the amount of money which one may buy or sell a share of common stock in the stock market. Hence change in equity price is the variations that occur on the price of share throughout the day especially when demand and supply varies. Mustafa and Nishat (2006) posit that market equity price is volatile and sensitive in the sense that changes occur rapidly due to political upheavals. Musyoki (2011) pointed out that besides profitability indices, other variables that affect share price includes interest rates, inflation rate, government regulation and investors behaviour.

According to Orjinta and Ighosewe (2022), equity risk, at its most basic and fundamental level, is the risk associated with holding common or preferred equity. Although investors can build equity

in various ways, including paying into real estate deals and building equity in properties, equity risks are risk associated with the purchase of either common or preferred equity.

Interest Rate Risk

Interest rate is the price charges placed for the use of money, which is usually expressed as an annual percentage of the principal. The Central Bank of Nigeria (CBN) regulates the Monetary Policy Rate (MPR), formerly minimum Rediscount Rate (MRR) which is official interest rate that anchors all other interest rate in the money market and economy (Ogunbiyi & Ihejirika, 2014). Similarly Corb (2012) insists that interest rate is an economic tool used by CBN to control inflation and boost economic development. Interest rate is seen as the cost of capital or an investment. In other words, it is a fixed value of fund received as return from an investment in stock which is expressed in percentage. Changes in interest rate on long term or short term basis is believed to have effect on stock return which is influenced by a change in monetary policy rate or discount rate of a central or reserve bank. Interest rate risk is the potential loss to the income and/or economic value of equity as a result of adverse movement in interest rates. Interest rate risks are factors that have adverse effects on a firm's earning and its economic position (Opoku-Adarkwa, 2011). Interest rate risk exposures involve managing the net interest margin i.e. interest income minus interest expense and controlling the risk posed by changing interest rates while trying to take advantage of fluctuating interest rates (Muriithi et al., 2016).

Interest rate is the price charges placed for the use of money, which is usually expressed as an annual percentage of the principal. Interest rate is an economic tool used by CBN to control inflation and boost economic development (Corb, 2012). Odubuasi et al (2020); Papa (2014) opine that high interest rate leads to slow growth and development as a result of high cost of capital. Zuhaib and Nizam (2015) in their work on inflation, interest rate and firms' performance with evidence from textile industry of Pakistan, they found that interest rate has significant positive effect on return on assets. Odubuasi et al (2020); Nwandu (2016) found that interest rate changes have negative effect on Oil and Gas sector and manufacturing sector of Nigerian economy respectively. Kisseih (2017) found interdependence between profitability and interest rate when they investigated the impacts of interest rate fluctuations on the growth of small and medium enterprises in Accra. Odalo, et'al (2016) differently applied descriptive design as they investigated the influence of interest rate on the financial performance of agricultural firms in Kenya. They administered 220 questionnaires and the result of their analysis indicate a positive and significant relationship between interest rate and firm performance.

Commodity Price Change

Ildirar and Iscan (2015) opine that commodity prices consist of the prices of basic materials and natural resources used in virtually all products and manufacturing process, notably among commodities are oil, wheat, iron and robber that are the main components of many common goods in our lives. More conveniently, commodities are classified into industrial crops (Timber), Fisheries, Cereals, Beverages, Livestock, Precious metals, Coal and Petroleum products (Farooki & Kaplinsky, 2012). Most of the commodities as mentioned above are agricultural output and products, in which case there must be an effect which the changes in the prices can cause to the performance of firms in agricultural sector. But then some authors had conducted research on these

variables; Ildirar and Iscan (2015) examined the interaction between stock prices and commodity prices on Eastern Europe and central Asia. They proxy commodity price with price of cereal, vegetable oils, meat, seafood, sugar, bananas and oranges. The result shows a strong evidence of correlation between commodity prices and stock prices. Gyasi (2016) looked at commodity price shock and African stock market with evidence from Ghana. He used cocoa, crude oil and gold price for measuring commodity prices and found that strong bi directional linkage exists between Ghana equity market and gold, and crude oil prices. Mongale and Eita (2014) investigated commodity prices and stock market performance in South Africa, they used prices of Platinum and gold as a measure of commodity price found that increase in commodity prices is positively associated with increase in stock market performance. Risman, et'al (2017) examined commodity prices, exchange rates and investment on firm's value mediated by business risk from Indonesian stock exchange. Commodity price was proxy with crude oil, coal, crude palm oil, gold, nickel and tin for a period 2010 to 2014. They found that oil price affects firm's value.

Financial Performance

Financial performance is a post business operation activity to determine how economically well or profitable the business has done within a particular period. In other words, financial performance is the extent to which financial goals or obligation of a firm is being accomplished. To determine the financial position of a firm, Irungu (2013) posits that financial performance analysis is conducted to identify the financial strengths and weaknesses of the firms by using and establishing relationship between items of the financial position and income statement. The financial performance is commonly measured by the ratios such as return on equity, return on assets, return on capital, return on sale and operating margin (Gilchris, 2013; and Ismail 2011). Financial performance is viewed by Rajkumar and Hanitha (2015) as a firm's ability to generate new resources from day-to-day operations over a given period of time. Financial performance is a post business operation activity used to determine how economically well or profitable the business has done within a particular period; it is the extent to which financial goals or obligation of a firm is being accomplished (Odubuasi 2020).

Performance comprises the actual output or results of an organization as measures against its intended output (or goals and objectives). It is one of the most important variables in the field of management research today. Although the concept of organizational performance is very common in academic literature, its definition is not yet a universally accepted concept (Gavrea, et'al 2011). Richard and Shelor (2009) view organizational performance as encompassing three specific areas of from outcomes: financial performance (profits, return on assets, return on investment.), product market performance (sales, market share); and (shareholder return (total shareholder return, economic value added). Specialists in many fields are connected with organizational performance including strategic planners, operations, finance, legal, and organizational development. In recent years, many organizations have attempted to manage organizational performance using the balanced scorecard methodology where performance is tracked and measured in multiple dimensions such as financial performance (shareholder return), customer service, social responsibility, internal business processes and employee stewardship.

Richard and Shelor (2009) defines organizational performance as the organization's ability to attain its goals by using resources in an efficient and effective, manner; effectiveness being the degree

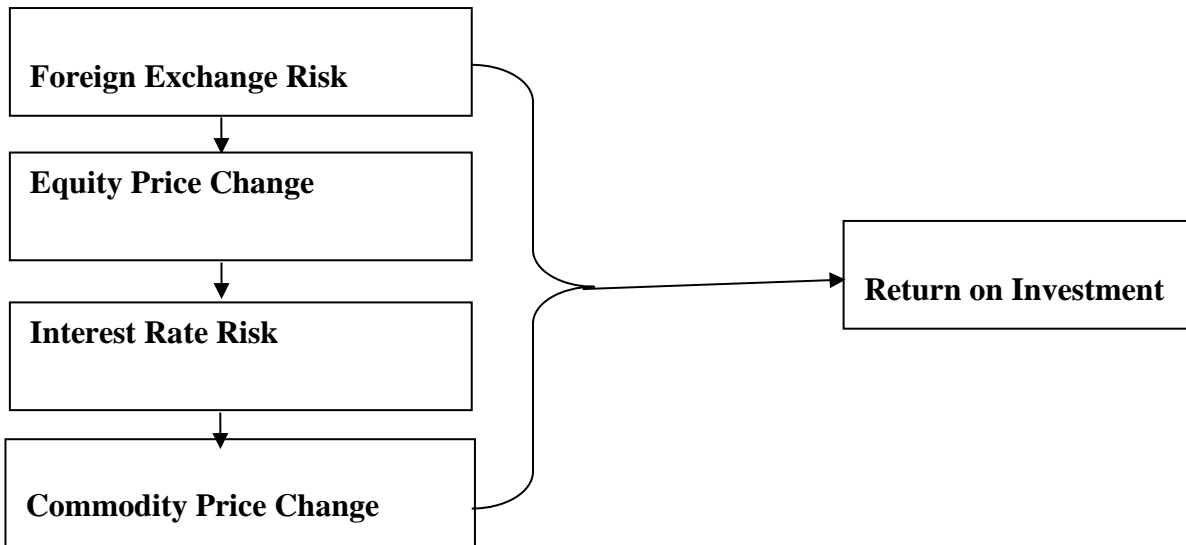
to which the organization achieves a stated goal, an efficiency being the amount of resources used to achieve an organizational goal. (Alien, et'al, 2007) noted that, when defining firm performance, it is important to consider a wide range or variety of organizational performance measures which include quality, productivity, market share, profitability, return on equity, customer base and overall firm performance. The term performance was sometimes confused with productivity. Ricardo, (2001) explains that there is a difference between performance and productivity. Productivity being a ratio depicting the volume of work completed on a given amount of time.

Return on Investment

According to Mariana, et'al (2016), the investment decision is a strategic decision and it is an integral part of the general policy of the company. Investments are means to secure the company's development in the medium and long term. The term investments have been defined by many authors over time. Note that investments are considered "resources deployed in the hope of achieving benefits during a long period of time" or money or other resources expended in the hope that in the future they will bring higher amounts of money or other benefits will occur (Mieilă, 2019). ROI (Return on Investment) is a concept of performance in any form of investment. For shareholders, the ultimate goal of the company is expressed in ROI. ROI is an indicator that shows to which extent a specific business produces gain from the use of capital. It shows the extent to which the amount invested in a particular action returns as profit or loss. Thus, it enables efficient assessment of an amount invested or, in other words, ROI allows measuring the result in relation to the means used to obtain it.

ROI is calculated as the ratio between operating profit obtained after the action of investment and the total amount invested (or the total investment costs). The result is a percentage of the relation obtained multiplied by 100. ROI is used by investors to select an investment project of several possible. As well it can be used after the completion of the investment, to measure its profitability. ROI is an indicator frequently used in performance analysis and decision-making. (Mariana, et'al 2016).

Fig. 2.1: Conceptual Diagram
Market Risk



Source; Researcher's Concept (2023)

2.2 Theoretical Framework

Modern Portfolio Theory

This research work is anchored on modern portfolio theory by Markowitz (1952). The Modern Portfolio Theory (MPT) refers to an investment theory that allows investors to assemble an asset portfolio that maximizes expected return for a given level of risk. The theory assumes that investors are risk-averse; for a given level of expected return, investors will always prefer the less risky portfolio. Hence, according to the Modern Portfolio Theory, an investor must be compensated for a higher level of risk through higher expected returns. MPT employs the core idea of **diversification** – owning a portfolio of assets from different classes is less risky than holding a portfolio of similar assets. According to Markowitz (1952), investors focused on assessing the risks and rewards of individual securities in constructing their portfolios. Since the 1980s, companies have successfully applied modern portfolio theory to market risk. Many companies are now using value at risk models to manage their interest rate and market risk exposures. While each company's method varies, this approach involves periodically evaluating the quality of credit exposures, applying a credit risk rating, and aggregating the results of this analysis to identify a portfolio's expected losses. The foundation of the asset-by-asset approach is a sound credit review and internal credit risk rating system. This system enables management to identify changes in individual credits, or portfolio trends in a timely manner.

Relevance of Modern Portfolio Theory to Market Risk

In Modern Portfolio Theory (MPT), market risk is a type of systematic risk. Modern Portfolio Theory assumes that every investor wants to achieve the highest possible long-term returns without taking extreme levels of short-term market risk. Risk and reward are positively correlated in investing; if you opt for low-risk investments, such as bonds or cash, you can expect lower returns. Proper diversification of a portfolio can't prevent systematic risk, but it can dampen, if not eliminate, unsystematic risk.

2.3 Empirical Review

Bassey (2022) examine market risks and profitability of deposit money banks in Nigeria: a cointegration and panel multiple regression analysis. This work, therefore, examined, within the cohort and semi-experimental research design framework, the effects of market risks on a bank's profitability using a sample of four banks selected through a purposive sampling technique. The co-integration and panel multiple regression analyses conducted showed that management of market risks had long-run effects on the profitability of DMBs in Nigeria. The interest rate had positive effects on bank profitability, while exchange rate and commodity prices reduced performance. The study recommended that banks manage their operations in a way that optimizes their earnings and profits in order to mitigate the risks of loss occasioned by exchange rate dynamics in Nigeria. Also, DMBs should revitalize their interest rate risk management strategies to further boost their earnings through interest income.

Orjinta and Ighosewe (2022) studied market risks management and performance of deposit money banks in Nigeria: the challenges of 4th industrial revolution. This study examined the effect of market risks on performance of 15 banks in Nigeria spanning from 2011 to 2020. The study relied on secondary data derived from the selected banks' financial statements to determine and measure the effect of fluctuations in market risks on Nigerian banks performance in this era of 4th industrial revolution by applying an all-inclusive panel least square estimate. The study used the ex-post facto research design. The data were obtained from annual reports of the 15 sampled banks. Accordingly, four (4) specific objectives and hypotheses were stated and the data obtained were subjected to some preliminary tests such as descriptive, correlation analysis and variance inflation factor. The hypotheses were tested and analyzed using panel least square estimate. The empirical analysis covered 150 bank-year observations and the results shows that interest rate risk (IRSK), foreign exchange rate risk (FXRSK) and capital adequacy risk (CARSK) have negative yet noticeable effect on the Nigerian banks' performance while equity risk (EQRSK) have positive yet minimal effects on Nigerian banks' performance on the short run. Meanwhile, on the Kao Cointegration test evidenced that, market risk has a long run effect on banks' performance in Nigeria. Consequently, market risk measured by IRSK, FXRSK, and CASK decreases the likelihood for Nigerian banks to make huge profit to a very large extent in the periods under review. As such, if Nigerian banks desire higher income especially in this era of 4th industrial revolution, they need to optimally manage their market risks.

Eyanuku (2022) studied an analysis of foreign exchange risk management and profitability of deposit money bank in Lagos, Nigeria. The use of foreign exchange management strategies results in reduced foreign exchange exposure hence minimal losses. The broad objective of the study is to determine the foreign exchange, risk management and profitability of deposit bank money in Nigeria, while the specific objectives are to analyze the risk associated with foreign exchange

management and access the effect of foreign exchange risk management on financial performance. This paper discusses the methods by which the various objectives earlier discussed in chapter one were accomplished. Specifically, this chapter deals with the various methods used for the study. In conclusion, the relevant authorities for instance The Central Bank of Nigeria should adequately put measures to safeguard the value of the domestic currency, this would ensure that the value on the same does not fluctuate much day in day out and finally, the study investigated the relationship between foreign exchange trading and financial performance of commercial banks in Nigeria and aim to shed some additional light on the topics of foreign exchange trading and risk. Finally, it was recommended that relevant authorities for instance the Central Bank of Nigeria should adequately put measures to safeguard the value of the domestic currency. This would ensure that the value on the same does not fluctuate much day in day out.

Kiptoo, et'al (2021) examines risk management and financial performance of insurance firms in Kenya over the period 2013–2020. The data was collected from 51 Insurance firms licensed to operate in Kenya as of 31 December 2020. Regression analysis was used and the results showed that risk management significantly affects the financial performance of insurance firms. In particular, the results indicate that credit risk negatively and significantly affects financial performance. The results suggest that firms with a higher proportion of non-performing receivables than total receivables perform poorly. Insurance firms should therefore put in place credit management strategies to ensure receivables are collected within the stipulated time to avoid cases of non-performing receivables and thus improve performance. The results also showed that market risk management positively and significantly affects financial performance. The findings imply that sound investment decisions result in an increase in investment income, which in turn increases financial performance. Insurance firms should therefore ensure proper management of their investments to boost performance. The findings also indicate that operational risk management positively and significantly affects.

Agubata and Odubuasi (2021) studied market risk and earnings capacity of agricultural firms in Nigeria for the period 2014 to 2018. Three objectives were formulated and the study employed Cause-effect research design using secondary data collected from CBN statistical bulletin and financial statement of the firms. Descriptive statistics and panel data analysis were adopted in analyzing the data gathered. Hausman test was used to choose the best estimates between fixed effect and random effect. The results show that interest rate change and exchange rate change have positive and significant effect on firm performance, while commodity price change effect was negative and also significant.. The study therefore recommends among others that government should ensure a favourable and more stable interest rate to a point that it could be attractive to foreign and local investors as it is an indicator of a stable economy.

Abubakar, et'al (2021) studied market risk and financial performance of listed oil and gas firms in Nigeria. The study used panel data from the annual reports and financial statements of seven listed oil and gas firms in Nigeria from 2008 to 2018. Descriptive statistics is used in data presentation, while fixed effect model (FEM) is utilised in analysing the impact of the independent variables as degree of financial leverage (DFL), interest rate risk (IRR) and foreign exchange exposure (FEE) on the dependent variable represented by return on assets (ROA). Results indicate that DFL has positive and significant impact on the financial performance, while IRR and FEE have no

significant impact on the financial performance proxy by ROA. The findings also reveal that age as a control variable has negative and significant impact on the ROA. The authors conclude that listed oil and gas firms in Nigeria were able to slightly improve financial performance by taking advantage of tax shields benefit attached to interest on debt. The study also concludes that in the long run, high volatility in interest rates, exchange rate and high cost of debt will injure financial performance. The study recommends that firms in the oil and gas sector should trade with caution when considering investment in fixed income securities due to high interest charges.

Dauda, et'al (2021) studied market risk and stock return of listed financial service firms in Nigeria. The population of this study consists of fifty-six (56) financial service firms listed in the Nigerian Stock Exchange Market. In arriving at the sample size of twenty-nine (29) firms the purposive sampling technique and filtering criteria were employed. Data were sourced secondarily from the audited annual report of financial service firms, Nigeria Stock Exchange fact book, and other relevant financial service firms' websites for period of twelve (12) years (2007-2018). Panel multiple regression technique of data analysis was applied using the ordinary least square estimator. The findings of the study revealed that book to market ratio as a proxy of market risk was insignificantly negative on stock return during the period under review. Net interest margin as a proxy of market risk revealed a significant positive effect on stock return during the period of review. Also, the study revealed that control variables of firm size, leverage had significant positive effects on stock return, though; the effect of monetary policy rate was positive but insignificant on stock return. The study concluded that a higher book to market ratio would reduce stock return and to a larger extent the reduction in stock return may not be affected significantly. It also concluded that a higher net interest margin would result to a higher stock return and vice versa. The study recommended that decision makers and portfolio managers of financial service firms should employ appropriate risk strategies through derivatives, forwards, futures, swaps, options that can mitigate market risk in order to optimize return.

Akinleye and Olanipekun (2021) investigated risk management and financial performance of manufacturing firms. More so, the study analyzed liquidity risk and market risk effect on after tax profit of manufacturing establishment in Nigeria. The study employed panel data over the period spanning from 2010-2019 across 10 firms. Secondary data were gathered through the annual reports of the selected firms. Correlation analysis and panel-based estimation techniques were used. The outcome showed that liquidity risk positively and significantly affects profit after tax while market risk (measured by interest rate risk) negatively and insignificantly affect profit after tax of sampled firms quoted in Nigeria. The study was anchored on Agency theory. This study concluded that efficient and effective risk management will positively affect performance of quoted firms in Nigeria, most specially management of internal risk such as the liquidity risk. Hence, firms should build an internal control system flexible in nature to harness the benefit of internal risk management and also normalize the negative effect of external risk such as the interest rate on performance.

Ugah, (2020) examined the financial risk management and bank profitability in Nigeria. Well-structured questionnaire data were drawn from a convenient sampling technique; a sample size of 56 management staff of Access Bank of Nigeria Plc. Simple linear regression was used for the test of hypotheses using statistical package for social science software version 20. The study was

anchored on financial distress theory. The study revealed that; there exist a significant positive effect of liquidity risk, credit risk, interest risk and inflation risk on return on assets of Access Bank Nigeria Plc. Based on the findings; it was recommended among others that banks should take proactive measures aimed at curbing financial risks as this will have a positive effect on their profit.

Atiso, et'al (2020) examined the effects of financial risk management practices on financial performance of banks in Ghana for the period of 2019-2020. Descriptive and Inferential statistics in the form of multiple linear regressions is employed to analyze this relationship. The independent variables were liquidity, market, credit, and operational risks while dependent variable were financial performance proxy by ROA. The was anchored on Financial intermediation Theory. The study finds risk management practices to be positively related to financial performance. Endogeneity among risk variables was also established. Banks are encouraged to view and consider banking regulations, policies, procedures and guidelines from regulators as a comprehensive risk management practice instead of just seeking to meet the regulatory requirements or creating risk awareness and risk management culture among all employees of the bank. They should review their risk appetite level and try other risk mitigation strategies that aim to optimize risk-return trade-off to improve on its profitability.

Olaoye, et'al (2020) examined the effect of financial risks on performance of Deposit Money Banks (DMBs) covering a period of 12 years (2007- 2018). Independent variables were on Credit risks, Insolvency risks, Liquidity risks and Market risks, while the dependent were on performance proxy by ROA. The study was anchored on prospect theory. The methodology of the study makes use of ex-post facto research design. While the populations of the study were nineteen deposit money banks, the study sample comprised ten (10) DMBs. The panel regression models estimated using Unobserved Effects Model (UEM), while the result of the Hausman test indicated between fixed effect model and random effect model at 5% inference. The study findings showed that Credit Risk was negative and statistically significant to deposit money banks' performance. The result also shows that Liquidity Risk is inversely and insignificantly related to banks' profitability and Insolvency Risk (INSRK) have negative signs that are statistically insignificant to banks profitability Market Risk has insignificant and positive effect on Profitability at 0.05 level. Also, Credit Risk (CR) was found to be negative and statistically significant at Economic Value Added On the contrary, the result also shows that Liquidity Risk (LIQR) and Market Risk have positive signs that are statistically insignificant to Economic Value Added. On its part, Credit Risk (CR) established a negative and significant effect on Return on Assets. Liquidity Risk and Insolvency Risk have negative and positive signs that are statistically insignificant to Return on Assets. In relation to the findings of the study, the study recommended amongst others that it is fundamental for DMBs in Nigeria to practice scientific credit risk management, improve their efficacy in credit analysis and loan management to secure as much as possible their assets, and minimize the high incidence of non-performing loans and their negative effects on financial performance.

Odubuasi et'al (2020) studied effect of market risks on the financial performance of firms in Nigeria. The study employed causal research design and used secondary data. The research covers the twelve (12) firms listed under Oil and Gas sector on the Nigerian Stock Exchange. Secondary data were collected from Central Bank of Nigeria Statistical Bulletin and the financial statements

of the firms which spanned from 2014 to 2018. The data were analysed with descriptive statistics, correlation and multiple regression analysis. The results therefrom indicate that exchange rate has significant effect on both ROA and ROE of Oil and Gas firms. Additionally interest rate has significant effect on ROE and insignificant effect on ROA. More results show that commodity price change has no significant effect on both ROA and ROE, also equity price change has no significant effect on ROA and ROE of firms in Oil and Gas sector in Nigeria. The study recommends among other things that the firms should adopt the use of hedging to control exchange rate changes and government should maintain a low interest rate that will aid firms increase their profitability.

Karugu, et'al (2020) studied market risks, firms' size and financial performance: reality or illusion in microfinance institutions in Kenya. The study employed positivism philosophy and used explanatory non-experimental research designs. The targeted population was all the thirteen registered Deposit Taking microfinance institutions in Kenya and census approach was used. The study used secondary data which was collected from MFIs annual audited financial reports for the period between 2014 and 2018 using data collection instruments. The study was anchored on two theories namely Dynamic Capabilities theory and Modern Portfolio Theory. Diagnostic tests were applied to test on multicollinearity, autocorrelation, heteroscedasticity, normality test, and stationarity. Panel data multiple regression analysis was used to analyze the collected data and the results presented using figures and tables. The results indicated that firm's size has a significant moderating effect on the relationship between market risk and financial performance of microfinance institutions. The study recommended that the CEOs of microfinance Institution should employ mechanism of identifying the optimal firm size that organization needs to operate in to achieve better financial performance.

Okeyo and Miroga (2020) determined the effects of financial risks on performance of commercial banks in Kenya. In particular, this study aimed at determining the impact of liquidity risks on return of assets (ROAs) of commercial banks in the country. Questionnaires were also used to source for data. Internal consistency checks of data were performed using Cronbach's alpha to check for the reliability of data. Financial performance on commercial banks was assessed on terms of return on assets. The study uncovered that liquidity risks have a positive and significant effect on performance of the commercial banks. The study concluded that the banks involved in the study had well managed their liquidity and that bank earnings were positively influenced by higher interest rates. This study recommended that commercial banks should have a proper methodology for the measurement, identification, and control of financial risks.

Nugroho (2020) examines the effect of book to market ratio, profitability, and investment on stock return. This study uses data of listed non-finance sector companies in LQ45 Indonesian Stock Exchange for the period 2008- 2017. Expected profitability associated with ROA value and expected investment associated with growth of assets. This analysis method used in this study is regression model with panel data. This study found that book to market ratio has a significant positive effect on stock return, Return on Assets (ROA), as a proxy of expected profitability, also has a significant effect on stock return. Unlike the other variables, growth of assets, as a proxy of expected investment, has a not significant adverse effect on stock return.

Ayman, et'al (2020) studied the impact of risk management on financial performance of banks: the case of Jordan. The research implemented the quantitative methodology by distributing the questionnaires to over 300 participants; however, only 123 respondents replied to them. The results were analyzed using regression analysis and proved a relationship between risk management and financial performance. The results showed a direct relationship between credit, liquidity, market risk, and financial performance. The findings showed that For every one unit increase in risk control, the risk financial performance is affected by 1%, while for every one unit increase in credit risk, the risk financial performance is affected by 1.6%, while for every one unit increase in market risk, the financial performance is affected by 1.5% and for every one-unit increase in liquidity risk the financial performance is affected by 4.7%.

Basel and Mohammad (2020) explored the effect of financial risk on the performance of listed banks in Bahrain and the relative value of the most popular types of risk. The research covers 11 of the 18 banks in Bahrain from 2014 to 2018. Based on the availability of data, data was collected from the Bahrain Stock Exchange Database. Alternatively, the most common metrics, ROA, was used for bank performance and risk measures. The study is on agency theory. The independent variables were on capital risk, exchange rate risk, liquidity risk and operating risk while dependent were on performance. Regression analysis reveals that there is an insignificant relationship between bank performance, exchange rate risk, liquidity risk and operating risk. The findings also indicate an important positive relationship between bank performance and capital risk. In addition, the findings indicate that capital risk is the most significant form of risk. The research advises that attention be paid to operational risk, which is primarily related to uncertainty about the earnings of a financial company due to computer system failures, mistakes, abuse by staff, or risk of loss due to unforeseen operating expenses.

Onyefulu, et'al (2019) ascertained the relationship between Financial Risk and Performance of Deposit Money Banks (DMBs) listed on Stock Exchange of two selected West African countries using a sample of twenty (20) Deposit Money Banks (DMBs) for the period of 2009-2018. Ex-Post Facto research design was employed while secondary data were collected and subjected to multiple regression and correlation analysis in order to achieve the study objectives. The study was anchored on financial distress theory. Three (3) specific objectives and hypotheses were tested and analyzed using descriptive statistics, Pearson correlation analysis and panel regression analysis. Financial Risk, which is the independent variable, was measured by Liquidity Risk, operational risk and interest rate risk, while Performance which is the dependent variable, was measured by Return on Assets and Return on Equity. Our result revealed that Liquidity risk has negative and significant effect on performance of banks in both Ghana and Nigeria using ROA model which was statistically significant at 1% level of significance while using ROE the negative effect of credit risk on banks performance was found to be statistically insignificant. Operational risk was discovered to have positive and significant effect on performance of Banks in West Africa.

Olamide, et'al (2014) The Effect of Risk Management on Bank's Financial Performance in Nigeria. This study investigated the impact of effective risk management on bank's financial performance. The Ordinary least square Regression was employed in testing the hypothesis formulated. Data was collected from the annual reports of banks listed on the floor of the Nigerian Stock Exchange. The study observed that there exist a negative non-significant relationship

between risk management proxies and bank's performance as captured with return on equity. Thus financial performance cannot be explained away by the compliance or non-compliance to Basel's regulation by financial institutions, but could be as a result of the accumulation of minor difficulties and inconsequential malfunction of the individual actors resulting in a massive breakdown.

Norhafiza, et'al (2014) studied the impact of commodity prices (palm oil price, oil price, and gold price), interest rate, and exchange rate on the Malaysian stock market performance. Employing the bounds test approach, the results of the study showed cointegrating relationships among variables. Specifically, the results revealed a significant influence of palm oil price on the stock market index. However, no significant influence was observed for both the oil price and gold price. Interest rate and exchange rate showed significant influences, which are consistent with past empirical studies. One important policy implication from this study is that the authorities should also pay attention to the effect of commodity prices, in addition to macroeconomic variables, in implementing relevant polices, as they may have a negative impact on the Malaysian stock market.

3.0 Research Methodology

This study make use of *ex-post facto* research design. According to Ofor (2022) an *ex-post facto* research design is a quasi-experimental research design that occurs where the variable under study cannot be manipulated or controlled by the researcher but rather the data about on the variables under study already exist in records. We employ *ex-post facto* research design due to its special characteristics which are the event that has already occurred hence there is no need for manipulation or alteration and it is also less costly and less time consuming. The study is conducted in Nigeria, focusing on quoted agricultural and oil and gas sector in the Nigeria Exchange Group from 2012 to 2022. The choice of the sectors is premised on the fact that agriculture is the bedrock of economic growth, development and poverty eradication in the developing country like Nigeria and oil and gas sector is seen as one of the major sources of revenue in Nigeria. The population of the study consist of all the twenty three (23) quoted companies listed under the non-financial sectors of Agricultural sector and Oil and Gas sector that are listed on the floor of the Nigerian exchange Group limited up to December, 2022. The study adopted judgmental sample size of the study is 14 non-financial firms of Agriculture and Oil and Gas firms in Nigeria out of total population of 23. They are selected based on judgmental sampling technique. The reason for this is that, some of the firms could not make available their information we need in this study. Therefore, we discard them. The study uses secondary data that covered the period of eleven (11) years spinning from 2012-2022. Data were collected from the published financial statement of quoted agricultural and oil and gas firms in the Nigerian Exchange Group for the various years covered by the study.

Model Specification

This study adapted the model from the study of Abubakar, et'al (2021)

$$ROA = (\beta_0 + \beta_1DFL_{it} + \beta_2IRR_{it} + \beta_3FER_{it} + \beta_4AGE_{it} + \mu)$$

DFL = Degree of financial leverage for company

IRR = Interest rate risk for company

FER = Foreign exchange exposure for company

AGE = Age for company i in year t.

μ = error term

The model was modified to suit the variables used. Hence the model for the study is anchored on the specific objectives.

$$\text{ROI} = f(\text{FER}, \text{IRR}, \text{EPC}, \text{CPC}) \dots \dots \dots 1$$

This can be econometrically expressed as

$$\text{ROI}_{it} = \beta_0 + \beta_1 \text{FER}_{it} + \beta_2 \text{IRR}_{it} + \beta_3 \text{EPC}_{it} + \beta_4 \text{CPC}_{it} + \mu \dots \dots \dots 2$$

Equation 1 and 2 are the linear regression model used in testing the null hypotheses.

Where:

ROI = Return on Investment

FER = Foreign Exchange Risk

IRR = Interest Rate Risk

EPC= Equity Price Change

CPC = Commodity Price Change

β_0 = Constant

$\beta_1 - \beta_4$, = are the coefficient of the regression equation

μ = Error term

i = is the cross section of firms used

t = is the year (time series)

Operationalization of Variables

Variables	Measurements	Source
Dependent Variable Return on Investment(ROI)	Net Income Divided by Total Shares	Zamfir, Manea, & Ionescu, (2016)
Independent Variables		
Foreign exchange risk (FER)	log of Foreign Exchange Gains or Losses	Abubakar, Dantsoho and Sadiq (2021)
Equity Price Change	The Rate of Change in the Price of Equity from one year to another.	Odubuasi Wilson-Oshilim and Ifurueze (2020)
Interest rate risk (IRR)	Log of Net Interest (interest paid minus interest received)	Agbeja, Adhlakun, & Udi (2016).
Commodity Price Change	The Rate of Change in the Price of Commodity from one year to another.	Odubuasi Wilson-Oshilim and Ifurueze (2020)

4.0 Data Analysis

Descriptive Statistics

Table 4.1 accounts for the descriptive statistics. Various areas considered include Mean, Maximum, Minimum, Standard deviation values, and Observations:

Table 4.1: Summary of Descriptive Statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
ROI	5.03	6.42	38.37	-52.18	11.72	154
FER	276.50	305.79	423.90	157.31	96.52	154
EPC	157.10	12.38	2617.18	0.20	438.95	154
IRR	8.08	6.20	16.80	1.20	4.37	154
CPC	61.57	56.99	97.98	19.20	24.10	154

Source: Author's Compilation Using E-views 9 (2023)

A summary (snapshot) of the descriptive data as shown in appendix 3 is provided in table 4.1. Based on the descriptive data, the study found that the chosen companies had an average return on investment of 5.03%. In the meanwhile, the ROI model's greatest and lowest values are 38.37% and -52.18%, respectively. This indicates that during the course of the study, the sampled oil and gas and agricultural industries reported the highest ROI of 38.37%.

Furthermore, the result for interest rate change suggests that there hasn't been much of a shift in interest rates during the period. The mean value of the equity price change result shows that the stock prices of oil and gas and agricultural companies varied significantly throughout the course of the study period. The difference between the highest and minimum numbers confirms the significant variations or volatility in the share prices of the Oil and Gas and Agricultural companies used.

Last but not least, the analysis of the rate change in crude oil prices reveals that the price of crude oil has changed very little over the course of the research, remaining relatively steady. The outcome indicates that there are no outliers since all of the explanatory variables are regularly distributed.

Correlation Analysis

The correlation matrix explains the nature of relationship between the dependent and independent variables of the study as well as the independent variables among themselves. The summary of the associations among the variables of the study is presented in table 4.2:

Table 4.2: Summary of Correlation Analysis

Variables	ROI	FER	PEC	IRR	CPC
ROI	1.000000				
FER	-0.783771	1.000000			
EPC	0.387013	-0.245604	1.000000		
IRR	-0.016084	-0.030949	0.055831	1.000000	
CPC	0.044134	-0.002808	-0.183192	-0.027480	1.000000

Source: Author's Computation Using E-views 9 (2023)

The findings of the correlation study indicate a negative association between foreign exchange risk and ROI. This indicates that, rise in foreign exchange risk will reduce ROI. Also, changes in interest rates are negatively correlated with return on assets; however, changes in exchange rates, interest rates, and the price of crude oil and commodity price risk are positively correlated. This indicates that a rise in interest rate fluctuations will result in decreased Return on Assets performance. Changes in interest rates, the price of crude oil, and equities prices all have a negative impact on return on equity. The negative association shows that Oil and gas agric. firms' performance.

Regression Analysis

Table 4.7: Robust Random Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.529885	9.619026	0.366969	0.7142
FER	0.262010	0.095893	2.732302	0.0072
EPC	0.812336	0.245312	3.311445	0.0012
IRR	-0.032213	0.137872	-0.233641	0.8156
CPC	-0.104875	0.049420	-2.122101	0.0359
Effects Specification				
			S.D.	Rho
Cross-section random			5.030111	0.2765
Idiosyncratic random			8.136192	0.7235
Weighted Statistics				
R-squared	0.569425	Mean dependent var	2.361267	
Adjusted R-squared	0.544816	S.D. dependent var	8.771662	
S.E. of regression	8.111698	Sum squared resid	8882.953	
F-statistic	6.884510	Durbin-Watson stat	1.534926	
Prob(F-statistic)	0.000045			
Unweighted Statistics				
R-squared	0.591902	Mean dependent var	5.185223	

Sum squared resid 11926.50 Durbin-Watson stat 2.043225

Source: Author's Computation Using E-views 9 (2023)

Table 4.7 reported a weighted R-squared value of 0.569425 and weighted adjusted R-squared value of 0.544816. This figure shows that the market risk factors employed in the study may account for around 56.84% of variations in the performance of the sampled companies. The value of F-statistics of 6.884510 and its probability value of 0.000045 demonstrate how accurately described the regression model is. Again, the model evident that, even at 5% levels, the model is still highly statistically significant. Meanwhile, the value of Durbin Watson estimated at 1.534926 indicates that the model is not badly affected by autocorrelation. This suggests that the model is fit for prediction. It is on these bases that, each of the research hypothesis postulated in earlier chapter of this research were tested in the next section of this chapter.

4.2. Test of Hypotheses

Hypotheses 1: Exchange rate change has no significant effect on firm performance

The regression result in table 4.7 reported a coefficient value of 0.262010, t-statistics value of -2.732302 which is higher than 1.96 benchmark and a probability value of 0.0072 which is less than 5% level of significance but greater than 95% confidence level. By implication, the probability value which is less than 5% level of significance but greater than 95% confidence level shows that the effect of exchange rate change on the performance of Oil and Gas companies in Nigeria is statistically significant. It is on this basis; the study rejects the null hypothesis one and accepts the alternate hypothesis. As such, the study reaffirmed that, exchange rate change has significant effect on firm performance.

Hypotheses 2: Equity Price Change has no significant effect on firm performance

The regression result in table 4.7 reported a coefficient value of 0.812336, t-statistics value of 3.311445 which is higher than 1.96 benchmark and a probability value of 0.0012 which is less than 5% level of significance but greater than 95% confidence level. By implication, the probability value which is less than 5% level of significance but greater than 95% confidence level shows that equity price changes has a high statistical significant effects on firm performance. It is on this basis; the study rejects the null hypothesis two and accepts the alternate hypothesis two instead. As such, the study reaffirmed that, equity price change has significant effect on firm performance.

Hypothesis 3: Interest rate change has no significant effect on firm performance

In the case of hypothesis three, the regression result in table 4.7 reported a coefficient value of -0.032213, t-statistics value of -0.233641 which is lower than 1.96 benchmark and a probability value of 0.8156 which is greater than 5% level of significance but less than 95% confidence level. By implication, interest change has a statistical significant effect on firm performance within the periods under review. It is on this basis; the study rejects the null hypothesis three Interest rate change has no significant effect on firm performance is retained.

Hypothesis 4: Commodity Price change has no significant effect on firm performance

The regression result in table 4.7 reported a coefficient value of -0.104875, t-statistics value of -2.122101 which is higher than 1.96 benchmark and a probability value of 0.0359 which is less than 5% level of significance but greater than 95% confidence level. By implication, the probability value which is less than 5% level of significance but greater than 95% confidence level shows that the effect of commodity price change on the performance of Oil and Gas companies in Nigeria is statistically significant. It is on this basis; the study rejects the null hypothesis four and accepts the alternate hypothesis. As such, the study reaffirmed that, commodity price change has significant effect on firm performance.

4.3. Discussions and Policy Implications

Foreign Exchange Rate Change and Firm Performance

The panel corrected Random Effect Model estimate as presented in table 4.7 reported a positive coefficient value of 0.262010. This reveals that exchange rate has positive effect on firm performance measured by return on investments of sampled quoted firms. To further substantiate this claim, the regression estimate reported a positive t-statistics value of 2.732302. By policy implications, the more the Exchange rates changes its values, the higher Return on Investments. Put differently, exchange rate change has inverse effect on ROI, an indication that a unit increase in exchange rate would cause 0.262010 unit changes in ROI. This deviates sharply from the negative Apriori expectation. The study further confirms that, even if the Nigerian currency continues to devalue while the foreign currency retains its value, the sampled firms would still record higher return on investments.

Furthermore, the probability value of 0.0072 which is less than 5% level of significance but greater than 95% confidence level however shows that the effect of exchange rate changes on performance (Return on Investment) of sampled firms in the Agricultural and Oil and Gas sectors are statistically significant. As such, the study therefore reaffirmed that, Exchange rate changes has significant effect on the performance of selected firms in Nigeria. By policy implication, exchange rate changes contribute immensely to higher financial performance of sampled firms within the reviewed periods.

The above result confirms with the submission of the Modern Portfolio Theory (MPT) which stresses that, no investor can achieve the highest possible long-term returns without taking extreme levels of short-term market risk which in this case foreign exchange risk. Notwithstanding, this result disagree with the finding of Bassey (2022) reported that, exchange rate and commodity prices reduced performance. Again, Orjinta and Ighosewe (2022) reported that, interest rate risk (IRSK), foreign exchange rate risk (FXRSK) and capital adequacy risk (CARSK) have negative yet noticeable effect on the Nigerian banks' performance while equity risk (EQRSK) have positive yet minimal effects on Nigerian banks' performance on the short run. Meanwhile, on the Kao Cointegration test evidenced that, market risk has a long run effect on banks' performance in Nigeria. Again, Eyanuku (2022) & Omondi (2019) whom substantively concluded that foreign exchange risk have a negative and significant effect on firm performance in Nigeria and Kenya

respectively. Lastly, Norhafiza, Sabariah and Rusmawati (2014) and Sabariah and Rusmawati (2014) who concludes that exchange rate changes have significant negative effect on stock returns.

Equity price change and firm performance

The panel corrected Random Effect Model estimate as presented in table 4.7 reported a positive coefficient value of 0.812336. This reveals that exchange rate has positive effect on firm performance measured by ROI of sampled quoted firms. To further substantiate this claim, the regression estimate reported a positive t-statistics value of 3.311445. By policy implications, the more the equity price changes its values, the higher ROI. Put differently, equity price change has a linear effect on ROI. This indicates that a unit increase in equity price change would cause 0.812336 unit changes in ROI. Put differently, a unit decrease in equity price change would cause 0.812336 unit decrease in ROI. By implication, for ROI to rise or fall, equity price would first rise or fall. This supports the Apriori expectation of the study.

Furthermore, the probability value of 0.0012 which is less than 5% level of significance but greater than 95% confidence level however shows that the effect of equity price changes on performance (Return on Investment) of sampled firms in the Agricultural and Oil and Gas sectors are statistically significant. As such, the study therefore reaffirmed that, Exchange rate changes has significant effect on the performance of selected firms in Nigeria. By policy implication, equity price changes contribute immensely to higher financial performance of sampled firms within the reviewed periods. The result is consistent with the result of Norhafiza, Sabariah and Rusmawati (2014) that crude oil price has no significant effect on stock market performance. However, it deviated sharply from the findings of Odubuasi Wilson-Oshilim and Ifurueze (2020) whom reported that equity price change has no significant effect on both ROA and ROE.

Interest Rate Change and Firm Performance (ROI)

The panel corrected Random Effect Model estimate as presented in table 4.7 reported a negative coefficient value of -0.032213. This reveals that interest rate has negative effect on firm performance measured by ROI. To further substantiate this claim, the regression estimate reported a negative low t-statistics value of -0.233641 that is less than 1.96. By policy implications, the more interest rate is dispersed, the lower Return on Investments. Put differently, the lesser the interest rate dispersed, the more profitable the targeted firms become. The reason behind this is that, higher interest rates (cost of borrowings) has the capacity to discourage private investors from investing which in turn reduces the earning capacity of the targeted firms to a great extent.

In terms of statistical significant, the probability value of 0.8156 which is greater than 5% level of significance but less than 95% confidence level however shows that, interest rate changes has an insignificant effect on firm performance (ROI). As such, the study therefore reaffirmed that, interest rate changes has insignificant effect on the performance of selected firms in Nigeria. By policy implication, interest changes contribute minimally to the financial performance of sampled firms within the reviewed periods. Justifiably, the finding conforms to that of Abubakar, Dantsoho and Sadiq (2021); Odubuasi et al (2020); & Nwandu (2016) whom reported that. interest rate risk (IRR) has no significant impact on the financial performance proxy by ROA. Also, the study is in line with the findings of Odubuasi Wilson-Oshilim and Ifurueze (2020) whom reported that interest rate has significant effect on ROE and insignificant effect on ROA. However, it deviated

sharply from the findings of Dauda, Samuel, Okpanachi and Suleiman (2021); Kisseih (2017); & Odalo, Achoki and Njuguna (2016) whom reported that, a positive and significant relationship between interest rate and firm performance. Also, Bassey (2022) reported that, interest rate had positive effects on bank profitability, while exchange rate and commodity prices reduced performance. Similarly, Omondi, (2019) substantively concluded that interest rate risk have a positive and significant effect on the banks' financial performance while, credit risk and foreign exchange risk have a negative and significant effect on financial performance of commercial banks in Kenya respectively. Lastly, Agubata and Odubuasi (2021) affirmed that, interest rate change and exchange rate change have positive and significant effect on firm performance, while commodity price change effect was negative and also significant.

Commodity Price Change and Firm Performance

The panel corrected Random Effect Model estimate as presented in table 4.7 reported a negative coefficient value of -0.104875. This reveals that commodity price changes have negative effect on firm performance measured by ROI of sampled quoted firms. To further substantiate this claim, the regression estimate reported a negative t-statistics value of -2.122101. By policy implications, the more the commodity price disperses, the more the targeted firms' ROI decreases. Put differently, commodity price change has inverse effect on ROI. This therefore indicates that, if commodity price disperses by a unit, ROI would fall by -0.104875. This supports the Apriori expectation of the study. The study further confirms that, even if the Nigerian commodity prices increases, the sampled firms' ROI will fall sharply.

In terms of statistical significant, the probability value of 0.0359 which is less than 5% level of significance but greater than 95% confidence level however shows that the effect of commodity price changes on performance (ROI) of sampled firms in the Agricultural and Oil and Gas sectors are statistically significant. As such, the study therefore reaffirmed that, commodity price changes has significant effect on the performance of selected firms in Nigeria. By policy implication, commodity price changes contribute immensely to higher financial performance of sampled firms within the reviewed periods. One important policy implication from this study is that the authorities should also pay attention to the effect of commodity prices, in addition to macroeconomic variables, in implementing relevant polices, as they may have a negative impact on the ROI of quoted firms in Nigeria. Justifiably, this result is in tandem with the findings of Agubata and Odubuasi (2021) whom affirmed that, commodity price change effect was negative and also significant. Also, Bassey (2022) reported that, exchange rate and commodity prices reduced performance. In like manner, Gyasi (2016) evidenced that, commodity price shock have high effect on the Ghanaian stock market. This findings was reaffirmed by Risman, Salim, Sumiati and Indrawati (2017) whom reported that commodity prices, exchange rates and investment on firm's value mediated by business risk from Indonesian stock exchange. Again, Norhafiza, Sabariah and Rusmawati (2014) reported that, a significant influence of palm oil price on the stock market index. However, no significant influence was observed for both the oil price and gold price. Interest rate and exchange rate showed significant influences, which are consistent with past empirical studies.

5.0 Summary of Finding Conclusion and Recommendations

5.1 Summary of Findings

This study examined the effect of market risk on financial performance of agricultural and oil and gas firms in the Nigerian exchange group for a period of eleven years spanning from 2012 to 2022. The study adopted the *ex-post facto* research design since the data under investigation are secondary in nature. In line with the four specific objectives of this study, four research questions were raised and four hypotheses were formulated in their null forms. The Robust Random Effect Model was used to test the research hypotheses formulated in null forms.

Sequel to the various results presented, the followings are therefore the major findings of this study:

1. Foreign exchange rate change has a positive significant effect on the financial performance (ROI) of sampled firms in the Nigerian exchange group.
2. Equity price change has a positive significant effect on the financial performance (ROI) of sampled firms in the Nigerian exchange group.
3. Interest rate change has a negative insignificant effect on firm performance (ROI) of sampled firms in the Nigerian exchange group.
4. Commodity price change has a negative significant effect on the performance (ROI) of sampled firms in the Nigerian exchange group.

5.2. Conclusion

One major obstacle to a company's existence in Nigeria is market risk. This study looks into how Oil and Gas has fared in the turbulence of this market risk because of the ambiguity and un-diversifiability of the risk. The variables utilized to indicate market risk were changes in interest rates, currency rates, commodity prices, and equities prices. The four main components of market risk. On the other side, ROI was used as proxies for the company performance. The goal of the study was to investigate the relationship between these market risks and performance experimentally. Consequently, the study substantively concluded that, the financial performance (ROI) of the targeted firms is largely determined by rise in Foreign exchange rate change and Equity price and fall in commodity price change.

5.3. Recommendations

In line with the major findings of this study and the conclusion reached, the following policy recommendations were made:

1. The relevant authorities should adequately put measures to safeguard the value of the domestic currency. This would ensure that the value on the same does not fluctuate much day in day out.
2. The targeted firms should as a matter of urgency trade with caution when considering investment in fixed income securities due to high interest charges. This is because; they may have a high demeaning effect on the equity prices.

3. The apex bank (CBN) should among others seek for a favourable and more stable interest rate to a point that it could be attractive to foreign and local investors as it is an indicator of a stable economy.
4. The authorities should also pay attention to the effect of commodity prices. This can be achieved by ensuring that, the constant rise in the prices of commodities are hedged.

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