

Stock Market Performance Implications for Monetary Policy Rate in Nigeria

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Abstract

The role of stock market in the development of any economy has been regarded as crucial most especially in developing nations like Nigeria where mobilization of capital and resources is a pertinent issue. The drive propelling this study was to assess the interaction of the capital market performance with selected macroeconomic variables in Nigeria. The study adopted ex-post facto research design. Data were sourced from secondary sources such as the World Bank, Food and Agricultural Organization, the Central Bank of Nigeria Statistical Bulletin, and the National Bureau of Statistics (NBS). Non-Linear Autoregressive distributed lagged (NARDL) model was used for estimation of data. The study found that capital market performance has no significant effect on cash reserve ratio in Nigeria. In the same way, capital market performance had no significant effect on monetary policy rate in Nigeria. There was however, a significant effect of capital market performance on cash reserve ratio in Nigeria. However, no significant effect existed between capital market performance has and real gross domestic product in Nigeria. the study revealed that capital market performance has significant effect on human development index in Nigeria, even as capital market performance has no significant effect on gross fixed capital formation in Nigeria. The study recommended that government should stir up productivity in the economy to boost gross domestic product while keeping the cash reserve ratio high in order to tackle the spate of inflation within the economy. The apex bank should likewise, lower the monetary policy rate which is normally associated with the performance of all-share index. Also, the government should invest more in the capital market so as to improve the value of government stock (VGS) and use it to improve the human development index of Nigerians.

Introduction

The role of stock market in the development of any economy has been regarded as crucial most especially in developing nations like Nigeria where mobilization of capital and resources is a pertinent issue. For instance, neither the money market nor the capital market is fully developed to speed up the growth process in most developing economies most especially sub-Saharan Africans (SSAs). It is for this reason Isibo, Ikpefan, Okafor and Ojeka(2016) submitted that the money market in Nigeria is inefficient occasioned by absence of sub-segments where appropriate credit facilities are non-available thereby hampering the process of smooth operations of the markets. Supporting this view, Akinyede (2018) averred that the financial sector in Nigeria does not impact on the Nigerian economy. This is against what is obtainable in advanced economy where the money market makes a significant contribution to the economy by way of helping to generate liquidity from where governments, individuals and businesses can benefit (Isibo, et al.,2016; Yuanyuan, Kumari, Ilyas, Bhayo & Marwat, 2023).

In the last three decades, the capital market in Nigeria has gone through some challenges that necessitated some reforms. But by far among the major challenges are that most of the funds raised in Nigeria for the purpose of trading at the capital market are short term funds sourced through the money market which are not growth enhancing funds (Iheanacho, et al., 2023). Also, there is the issue of the maximum payout directives usually given by government to companies in the payments of dividends to shareholders with a view to curbing inflation. This makes shareholders to show preference for bonds thereby affecting the price of securities. This affects the ability of the capital market to spur the needed development. For instance, the market capitalization stood at ₦6.6 billion in 1986 or 3.0% increased to ₦285.8 billion or 58.4% in 1996 over the preceding year. In 2006, the market capitalization witnessed a further increase as it rose to ₦5121.0 billion or 76.6% but declined to -4.8% in 2016 occasioned by economic recession which the Nigerian economic entered into as a result of decline in crude oil price at the global market. Likewise, the covid-19 pandemic also affected the Nigerian capital market forcing the market capitalization to record only 12.7% growth in 2022. Besides the market capitalization, other indicators in the market such as All-Share Index, volume of transactions as well as equity prices also did not perform very well with attendant implications on a number of macroeconomic fundamentals such as growth of money supply and economic development.

Consequently, a number of macroeconomic variables reacted to the development in the capital market among which inflation rate and exchange rate were relatively more pronounced. For instance, the value of the naira to a United States dollar stood at ₦2.02/\$ but rose to ₦21.9/\$ in 1996 and further to ₦128.7/\$ in 2006. In 2016, the exchange further rose to ₦253.5/\$ before anchoring at ₦500/\$ in 2022. Similarly, the rate of inflation has continue to rise recording double digit for most of the period under consideration. According to available data from the National Bureau of Statistics, the annual inflation rate grew for the 10th consecutive month to 21.5% in November, 2022, from 21.1% obtained in the preceding month making it the highest in 17 years. This surge in inflation has been attributed to the increase in demand for goods and services, cash crunch occasioned by CBN policy of currency redesign, fuel scarcity, and persistent depreciation of the naira as well as rising production costs (Adama, Ohwofasa,&Onabote, 2022).

The fluctuations in the performance of the Nigerian capital market also affected monetary policy in Nigeria. As argued by Okoro (2017), a well-developed capital market is vital as it does not only provide more opportunities for greater mobilization of funds but also ensures better efficiency in resource allocation. This is not to be as investment returns in the stock market of most developing economies including Nigeria continue to be more reactive to changes in economic fundamentals due to their fragile and volatile nature (Adama, et al., 2022). The result is that the capital market in Nigeria becomes even more unpredictable and unstable unlike the stock markets in developed economies. As expected, a progressing capital market should improve the fiscal policy space with concomitant impact on economic development. However, the inability of the stock market to function to the optimum in mobilizing resources for capital formation, pressure has continued to mount on the fiscal projections. For instance, since the economic and financial crisis of 2008 where the prices of mortgage resulted in a bubble and eventual crash of major stocks across the world's capital market including Nigeria, government spending has continued to act as bailout. In the economic recession in 2014-2016 and the emergence of the recent corona virus pandemic,

government spending was used as cushion for the capital market. In the same, money supply has continued to experience increase resulting in a rise in prices of goods and services.

For instance, government overall deficit as a ratio of GDP, according to the CBN statistics, stood at -4.2% in 1986 but this declined to 0.8% in 1996. In 2006, the deficit grew to -0.3%, -2.6% in 2016 and a further increase to -4.5% in 2022. Likewise, money supply which recorded 21.9% in 1987 increased to 48.1% in 2000 but however declined to 6.7% in 2010. The growth of money supply fluctuated henceforth reaching the trough of 2.9% in 2020, rose 13.3% in 2021 and again declined to 10.5% in 2022. This implies that over the last three decades, the performance of the capital market affected the activities of government through fiscal and money policies. Consequently, it is for this reason the country's growth and development has been hampered. For instance, the CBN statistics also indicated that the growth rate of the economy recorded 0.1% in 1986, increased to 4.2% in 1996 and a further marginal increase to 6.1% in 2006. However, in 2016 growth strangulated as it entered negative territory of -1.6%, an evidence that the economy went into recession in 2016 which it was yet to fully exit before the advent of the deadly covid-19 pandemic that shook the Nigerian economy to its very foundation. Accordingly, the growth rate of the economy was -1.9% in 2020 before oscillating to 3.4% and 3.3% in 2021 and 2022 respectively.

Similarly, the country's rate of economy development proxied by human development index was not better either. According to the UNDP statistics, HDI in Nigeria from 1986 to 1994 stood at 0.44%, 0.45% between 1995 and 1997, 0.46% between 1996 and 2004 and hovered between 0.43% and 0.49% from 2005 to 2011. The HDI grew from 0.51% in 2012 to 0.53% in 2022. This places Nigerian economic development in the like of Niger, Chad, Togo and Benin Republic. When compared to Western Economies such as Norway, Netherlands, US, UK and Germany with over 0.96% HDI, the rate of economic development in Nigeria is less than satisfactory. In order to reverse the trend, successive governments had initiated various policies aimed at addressing the issue but have not yielded the desire results.

Prior studies in the field tried to assess the effect of stock market development on economic growth using the growth rate of the GDP (Maku & Atanda, 2010; Usman, 2014; Okoro, 2017; Akwe & Garba, 2019). The current study departs from the aforementioned as it assessed effect of stock market performance on the monetary policy rate, a relationship rarely investigated in the literature.

Conceptual Review

Stock Market Performance

The term stock return refers to the gain or loss of a security in a particular period. According to Abina (2019), the return consists of the income and the capital gains relative to the investment made, and it is usually quoted as a percentage.

The stock market is the market where equity securities such as stocks, representing ownership shares in particular corporations issuing the securities, are traded (Alajekwu, Ezeabasili&Nzotta, 2013). It is a complex institution imbued with inherent mechanism through which long-term funds of the major sectors of the economy comprising households, firms, and government are mobilized, harnessed and made available to various sectors of the economy (Nyong, 1997).The stock market avail long-term capital to the listed firms by pooling funds from different investors and allow them to expand their businesses (Okoro, 2017). Also,

investors have the alternative avenues to invest their surplus funds as they carefully watch the performance of stock markets (Naik&Padhi, 2012).

Stock market performance is evaluated through stock returns which is the return that the investors generate out of the stock market. This return could be in the form of profit through trading or in the form of dividends given by the company to its shareholders from time-to-time. It is the changes in stock prices relative to the initial prices at the point of investor's decision to purchase the stock (Rutto, 2014 and Abina (2019). Jordan and Fischer (2002) cited Abina (2019) define return as the motivating force and the principal reward in the investment process and it is the key method available to investors in comparing alternative investments. They documented that the return has two components in which the basic component is the periodic cash receipts (or income) on investments, either in the form of interest or dividends. The second component is the change in the price of the asset which is commonly called capital gain or loss.

Indicators of the Stock Market

All-Share Index: In finance, a stock market index refers to index that measures a stock market, or a subset of the stock market that enables investors compare current stock price levels with past prices so as to ascertain the market performance. To this end, All-Share Index is a total market (broad-base) index, reflecting a total picture of the behaviour of the common shares quoted on the Exchange. It is calculated on a daily basis to show the movement of stock prices. All share index therefore refers to a series of numbers which shows the changing average value of the share prices of all companies on a stock exchange, and which is used as a measure of how well a market is performing (Adebiyi & Abeng, 2019).

Value of Total Transaction: This refers to the fair market value of all securities or assets indirectly transferred and which shall be determined in accordance with the Valuation Mechanism. Therefore, value of total transaction as the name implies means the aggregate value of all cash, securities and other property (i) paid to a company, its affiliates or their shareholders in connection with any transaction involving any investment in or acquisition of the company or any affiliates (ii) paid by a company or any affiliate in any such transaction involving an investment in or acquisition of another party or its equity holdings by the Company or any affiliate, or (iii) paid or contributed by the company or any affiliate and by the other party or parties in the event of any such transaction involving a merger, consolidation, joint venture or similar joint enterprise or undertaking. The value of any such securities (whether debt or equity) or other property shall be the fair market value thereof as determined by mutual agreement of the Company and the Underwriters or by an independent appraiser jointly selected by the Company and the Underwriters (Afful & Asiedu, 2013). Capital Markets Transaction means any transaction whereby a Company or any of its subsidiaries issues any debt securities whether in a public offering or a private placement. The average value of transaction is calculated by dividing the total value of all transactions by the number of transactions or sales. This can be calculated on a daily, monthly or annual basis (Abina, 2019).

Total Listed Equities: This is primarily an equity capital market (ECM) which refers to the arena where financial institutions help companies raise equity capital and where stocks are

traded. Equity share is a primary source of finance for any company giving investors rights to vote, share profits as well as claim on assets. Various types of equity share capital are authorized which include issued, subscribed, paid-up, rights, bonus as well as sweat equity and so on. Therefore, equities include common stock, preferred stock, additional paid-in capital, treasury stock, accumulated other comprehensive income / loss and retained earnings. Equity capital is raised by issuing shares in the company, publicly or privately, and is used to fund the expansion of the business. An equity share, normally known as ordinary share is a part ownership where each member is a fractional owner and initiates the maximum entrepreneurial liability related to a trading concern. These types of shareholders in any organization possess the right to vote (Abina, 2019). Two common types of equity exist namely stockholders' equity and owner's equity.

Value of Government Stock: Government stock deals with tradeable debt instruments issued by the government for meeting its financing requirements. It refers to investment products issued by government in the form of bonds, treasury bills, or notes. By buying or selling government securities (usually bonds), the federal government through the apex bank affects the money supply and interest rates. If, for example, the federal government buys government securities, it pays with a check drawn on itself. This action creates money in the form of additional deposits from the sale of government bonds. Government debt securities offer minimal credit risk, high levels of liquidity, a broad range of maturities and well-developed market infrastructure, including active derivative markets. Therefore, government debt securities may play important roles in financial markets that private sector securities may not fulfill.

Monetary Policy Rate

Monetary policy refers to actions and inactions taken by government in its attempt to fine tune the economy using monetary variables such money supply, interest rate and inflation rate. Monetary policy is the policy adopted by the monetary authority of a nation to affect monetary and other financial conditions in order to accomplish broader objectives like high employment and price stability which is normally interpreted as a low and stable rate of inflation (Lindsey & Wallich, 2018). According to these authors, monetary policy may be to contribute to economic stability or to maintain predictable exchange rates with other currencies. Today, most central banks in developed countries conduct their monetary policy within an inflation targeting framework, whereas the monetary policies of most developing countries' central banks' target some kind of a fixed exchange rate system (Jahan, 2014). A third monetary policy strategy, targeting the money supply was widely followed during the 1980s, but though has diminished in popularity since that, it is still the official strategy in a number of emerging economies including Nigeria.

Monetary Policy Rate (MPR) is the price tag the central bank puts on borrowing money. It is a special rate that influences how expensive or cheap it is to get a loan. This rate is used by the central bank to give everyone a hint about how they feel the economy is doing (Jahan, 2014). The policy interest rate is an interest rate that a country's monetary authority (i.e. the central bank) sets in order to influence the evolution of the main monetary variables in the economy (such as consumer prices, exchange rates or credit expansion, among others). The policy interest rate determines the levels of the rest of the interest rates in the economy,

since it is the price at which private agents - mostly private banks - obtain money from the central bank. These banks will then offer financial products to their clients at an interest rate that is normally based on the policy rate.

Theoretical Review

There are a number of theoretical underpinnings in the extant literature that explain the nexus through which capital market affects the economy. Accordingly, some of the theories are presented as follows:

Efficient Market Hypothesis (EMH)

The EMH was developed by Fama (1965). The theory postulated that financial markets are efficient or prices on traded assets that have already reflected all known information and therefore are unbiased because they represent the collective beliefs of all investors about future prospects. The hypothesis states that at any one point in time, prices reflect all available information. This implies that no amount of data mining can predict future prices. Furthermore, an analysis of past or current data cannot identify undervalued stocks. Applying this to the securities markets, the EMH implies that no trading mechanism can consistently beat the market. Hence, for a given level of risk, speculators cannot earn supernormal returns. Similarly, no betting system can consistently earn super normal returns. There are varying degrees of market efficiency by which Fama (1965) provided the traditional framework through which the EMH is examined.

The weak form simply states that all past information is reflected in current prices. The semi-strong form states that all publicly available information is incorporated in prices, while the strong form, an extension of the first two, states that all information, including insider information, is included in share prices. In practice, market efficiency is categorized by the strength of the efficiency that can be established with respect to a particular information set. Information sets can be categorized into: i. past price and volume information ii. Public information iii. Public and private information. Empirical tests of the EMH have relied on long-range dependence of equity returns. It shows that past information has been found to be useful in improving predictive accuracy. This assertion tends to invalidate the EMH in most developing countries. Equity prices would tend to exhibit long memory or long range dependence, because of the narrowness of their market arising from immature regulatory and institutional arrangement (Nagayasu, 2003, Nyong, 2003). Note that, where the market is highly and unreasonably speculative, investors will be discouraged from parting with their funds for fear of incurring financial losses. This situation has a detrimental effect on economic growth of any country such that investors will refuse to invest in financial assets. The implication is that companies cannot raise additional capital for expansion. Thus, it suffices to say that efficiency of the capital market is a necessary condition for growth and development in Nigeria.

Arbitrage Pricing Theory (APT)

The emergence of this hypothesis has been credited to work of Stephen Ross in 1976 as a theory where multiple risk factors can explain asset returns (Ross, 1976). It is a multi-factor model in which every investor believes that the stochastic properties of returns of capital assets are consistent with factors structure. Ross argues that if equilibrium prices offer no

arbitrage opportunities over static portfolio of assets, then the expected returns on the assets are approximately linearly related to the factor loadings or beta. In other words, the expected returns of a financial asset can be modelled as a linear function of various macroeconomic variables or theoretical market indices, where the sensitivity to change in each factor is represented by a factor-specific beta coefficient. The model-derived rate of return will then be used to price the asset correctly and the asset price should equal the expected end of period price discounted at the rate (Okoro, 2017). Ostensibly, the basic assumption of APT is that many macroeconomic factors such as the GDP, inflation rate, interest rate, exchange rate, and money supply among other macroeconomic variables are involved in the determination of risk and return relationship.

Generally, the theory of asset pricing demonstrates how assets are priced given the associated risks. The APT proposed by Ross has shown that there is an approximate relationship between the expected returns and the estimated explanatory variable as demonstrated in the equation below.

$$R_i = \lambda_0 + \lambda_1\beta_{1i} + \lambda_2\beta_{2i} + \lambda_n\beta_{nk} + \mu_i$$

Where R_i is the mean excess return for asset i and the β 's represents the sensitivity of a security's return to the risk factor k . The λ 's represent the reward for bearing risk associated with the economic factor fluctuations. The equation simply says that the expected return of an asset is a function of many factors and the sensitivity of the stock to these factors. Interestingly, APT does not specify the type or the number of macroeconomic factors for researchers to include in their study. According to APT, any new information about the fundamental macroeconomic factors such as real output, inflation, exchange rate, interest rate, foreign investment and so on may influence the stock price or returns through the impact of expected dividends, the discount rate or both (Naik & Padhi, 2012). For example, although Ross (1976) examined the effect of four factors including inflation, gross national product (GNP), investor confidence, and the shifts in the yield curve, they suggested that the APT should not be limited to these factors. Therefore, there is a large body of empirical studies that have included a large number of different macroeconomic factors, depending on the stock market they studied (Abina, 2019). Therefore, this theory is relevant to the current study.

Empirical Review

The review of the literature is undertaken looking at studies on the determinants of stock market performance, the relationship between stock market and fiscal policy as well as economic development in line with the objectives of the study. Accordingly, the empirical review is based on study objectives.

Tai et al (2022) investigated the differences in the degree of pass-through from the monetary policy rate to lending and deposit rates across Asian countries. Adopting a seemingly unrelated regression (SUR), the study showed that the transmission rate is sluggish, though, the pass-through to the lending rate is slightly higher compared to the deposit rate. Investigating the effect after the 1997 dot-com crisis, the study showed that the adjustment rate was much slower for most countries.

The study of Tai et al (2022) is related to the present study by variable combination through the use of monetary policy rate. However, the gap which justified the need for the present study is in study area, study period and the model of data analysis. While Tai et al's

(2022) study was conducted in Asia and covered the period of 2016 – 2007, the present study was conducted in Nigeria, and is updated to 2023; also the former used correlation and unrelated OLS for data analysis while the present study used NARDL.

In Turkey, Yildirim (2022) investigated how monetary policies and financial market conditions can result in the asymmetric movement of lending rates. Employing threshold autoregressive models (TAR), the study found that substantial asymmetries exist and that banks adjust their lending rates faster in response to an increase in money market rate, but act slower following a decline in money market rates. It also found sectoral heterogeneities, in that the degree of banks' reluctance to follow decreases in money markets rates varies across lending rates. Adopting a similar econometric approach (the TAR model),

The study is related to the present study by variable combination. However, there are gap between them in methodology and study period which have justified the need for the present study. The former estimated data using threshold autoregressive models (TAR) while the present study used NARDL

In this regards, using a cross-country study, Lee (2019) investigated whether fiscal policy affects stock markets in Belgium, France, Germany, United Kingdom and the USA using Granger causality test, vector error correction model and vector autoregressive estimates (VAR) techniques. The study utilized quarterly data on stock prices, federal budget deficits, money supply and industrial production from 1974-1998. Empirical results of the study revealed that the stock market in Belgium did not fully capture and reflect publicly available information on fiscal policy proxied by government budget deficits unlike in the other countries where fiscal policy significantly affected aggregate stock prices.

The study of Lee (2019) adopted VAR and VEC as tools of data analysis. The present study used non-linear auto-regression distributed lag (NARDL) as a dynamic model that is suitable for estimating stock markets performance. Also, while the former was conducted in Belgium, France, Germany, United Kingdom and the USA, the present study is domesticated in Nigeria.

In a related study, Afful and Asiedu (2019) examined the influence of fiscal policy and stock market activity on the lending-deposit rates spread in Sub-Saharan Africa using data from Botswana, Ghana, Mauritius and South Africa. The empirical findings showed that when pooled data were used, a positive and significant relationship exists between fiscal policy and the spread and stock market activity. However, when examined separately, and except for South Africa, in all the others, stock market activity had no significant impact on spread.

The study is relevant to the present study since both focuses on stock market performance. However, while the former used data from Botswana, Ghana, Mauritius and South Africa, the present study is restricted to Nigeria. The OLS used in the former also contradicts the NARDL used in the present study.

In the same vein, Grigoli and Mota (2018) using the same methodology explored the data for the Dominican Republic, the asymmetries in the effect of monetary policy rate on stock market performance in 99 SEAN countries. VAR was used for the estimation of data. The study found that monetary policy rate has significant asymmetric effect on monetary policy performance in SEAN countries.

The study of Grigoli and Mota (2018) is related to the present study by variable combination through the use of MPR. However, the gap which justified the need for the present study is in study area, study period and the model of data analysis. While Grigoli and Mota's

(2018) study which was conducted in Dominican Republic covered the period of 2001 – 2017, the present study is updated to 2023; also the former used VAR for data analysis while the present study used NARDL.

On the effect of monetary policy rate on market interest rates in Nigeria: A Threshold and NARDL Approach, Awopegba et al. (2018) examined the adjustment of retail rates to changes in the monetary policy rate. The study found a complete pass-through, suggesting the effectiveness of the monetary policy transmission mechanism. However, contrasting results emerge, as deposit rates react faster to increases in the policy rate, whereas lending rates react faster to policy rate reductions.

The study is related to the present study by variable combination. However, there are gap between them in study period which has justified the need for the present study. The former estimated data covering 1980 – 2017, the present study is updated to 2023.

In Nigeria, Kelilume (2017) investigated the effect of MPR on short-and long-term interest rates using the multivariate vector autoregressive (VAR) model. Findings indicate that the monetary policy pass-through to interest rates in Nigeria was incomplete. The study found a complete pass-through for the interbank, treasury bill and prime lending rates, whereas the pass-through to savings rate and the maximum lending rate was incomplete. The findings emphasised that a weak incentive system might be responsible for the poor and incomplete tracking of the savings rate.

Looking at Kelilume's (2017) study, one can deduce that it is closely related to the present study due to its focus on MPR and economic performance. However, the use of VAR for data analysis in the former contradicts the NARDL used in the present study. The two studies are therefore, consistent on variable combination but differ in methodology.

Aliyu et al. (2017) examined the effect of MPR on the short- and long-term interest rates in Nigeria. Using a mix of models (principal component, ridge regression and OLS), the study found that the Monetary policy rate influences the Treasury bill and interbank rates the most. It, however, found a negative and statistically insignificant relationship between the MPR and lending rates. This raises questions about whether the MPR should be retained as a determinant of lending rates.

The study of Aliyu et al. (2017) is related to the present study by variable combination through the use of monetary policy rate. The model of data analysis however, differs among the two studies. The study gap also manifests in the difference in study period. While Aliyu et al.'s (2017) study used a mix of models (principal component, ridge regression and OLS), and covered the period of 1994 – 2016, the present study which used NARDL, is also updated to 2023.

Likewise, Sanusi (2017), using a structural VAR (SVAR) approach, estimated the magnitude and speed of the IRPT of the monetary policy rates and interbank interest rates to the retail and deposit interest rates in Nigeria. The study revealed that the pass-through is generally incomplete and slow in Nigeria. Nevertheless, MPR to interbank rate is considerably larger and quicker than it is to the retail lending and deposit rates. Also, the pass-through of MPR to money market rates increased during the post-consolidation period, though, the pass-through to retail and deposit market rates decreased relative to the pre-consolidation period. Thus, the study concludes that distortions in the retail and deposit market remained, despite financial sector reforms, thereby rendering monetary policy ineffective and inefficient.

The study of Sanusi (2017) is related to the present study by variable combination through the use of MPR. However, the gap which justified the need for the present study is in the model of data analysis. While Sanusi's (2017) used SVAR for data analysis while the present study used NARDL.

Methodology

The methods are specified under research design, sources of data, method of data analysis, and model specification.

Research Design

This paper adopted an *ex-post-facto* research design. Backlund and Suikki (2015) explain that with an ex post facto research design, the researcher aims to determine the aspects of the problem that are crucial for a thorough analysis. In addition, with an ex post facto research design, the researcher has the opportunity to have a clear view of the problem from other related sources and narrow the research around these important items. In this case, the researcher adopts a technique that leads to exact or almost detailed facts when carrying out the study.

Sources of Data

The nature of data needs for this study is secondary. Data on the capital market indicators, broad money supply and monetary policy were sourced from the Central Bank of Nigeria publications particularly; the statistical bulletin. Data on cash reserve ratio, statutory liquidity ratio and gross fixed capital formation were sourced from the Nigeria Bureau of Statistics (NBS) while data on human development index were sourced from World Bank data bases. Also, data on all share Index, total listed equities, value of total transactions and value of government stocks were sourced from the central bank of Nigeria ©

Method of Analysis

The required formal pre-estimation diagnostics tests used in the paper were Augmented Dickey-Fuller unit root test to ascertain the stationarity of the data and NARDL bound test for co-integration test analysis that would not permit us to obtain a robust estimate of the parameters.

The Non-Linear Autoregressive Distributed Lag Model (NARDL) advanced by Shin, Yu and Greenwood-Nimmo (2014) was used for data analysis. This is in recognition of the non-linear nature of the relationship existing between economic variables as captured by Ezie and Ezie (2021). The relationship between agricultural credit guarantee scheme fund and poverty on the one hand, and inflation and poverty on the other hand, is therefore, expected to be non-linear, hence the adoption of NARDL approach. Also, hierarchical regression analysis was used to estimate the moderating effect of agricultural credit guarantee scheme fund in the relationship between inflation and poverty.

Post-estimation tests employed in the study were Breusch-Godfrey serial correlation LM test, Breusch-Pagan-Godfrey Heteroskedasticity test and stability test.

Model Specification

The study was predicated on two functional models. Firstly, the study assumed that monetary policy rate (MPR) is a function of capital market performance (CMP).

$$\text{Mathematically, this implies that } MPR = f(\text{CMP}) \quad (1)$$

Where MPR = monetary policy rate; and
CMP = capital market performance

Transforming equation 1 into Econometrics form leads to:

$$MPR_t = \alpha_0 + \alpha_1 CMP_t + \mu_t \quad (2)$$

Where: MOS is proxied by CRR, MPR and SLR; and

CMP is proxied by ASI, TLE, VIT and VGS

Thus, equation 2 becomes:

$$MPR_t = \alpha_0 + \alpha_1 ASI_t + \alpha_2 TLE_t + \alpha_3 VIT_t + \alpha_4 VGS + \mu_t \quad (3)$$

t = Time Trend

$\alpha_0, \beta_0, \lambda_0$ = Intercept or Constant Parameter

$\alpha_0, -\alpha_4$ = Slope of the explanatory variables or parameters to be estimated.

μ_t = Error Term or white noise.

Using interest rate (INT) as control variable, model 3 become:

$$MPR_t = \alpha_0 + \alpha_1 ASI_t + \alpha_2 TLE_t + \alpha_3 VIT_t + \alpha_4 VGS + \alpha_4 INT + \mu_t \quad (4)$$

A-priori Expectation

The *a-priori* expectation based on Arbitrage Pricing Model regarding the relationship between stock market performance and monetary policy rate imply that an increase in the performance of stock market indicators, all things being all, will lead to decrease in monetary policy rate in Nigeria, controlling for the negative effect of interest rate.

The a prior expectation of the parameters to be estimated are as expressed below

$$\frac{\Delta ASI}{\Delta MPR} < 0; \frac{\Delta TLE}{\Delta MPR} < 0; \frac{\Delta VIT}{\Delta MPR} < 0; \frac{\Delta VGS}{\Delta MPR} < 0$$

Results and Discussion

In this section of the paper, the results of descriptive statistics, trend analyses, the Unit Root test and the NARDL are presented, analyzed and discussed.

Trend Analyses of the Study Variables

This section focuses on the trend analyses of the study variables.

Trend Analysis of Capital Market Indicators and Monetary Stability Indicators in Nigeria

This sub-section shows the trend analyses of capital market indicators (LOGASI, LOGVIT, LOGTLE and LOGVGS) and monetary policy indicators (CRR, MPR and SLR) in Nigeria.

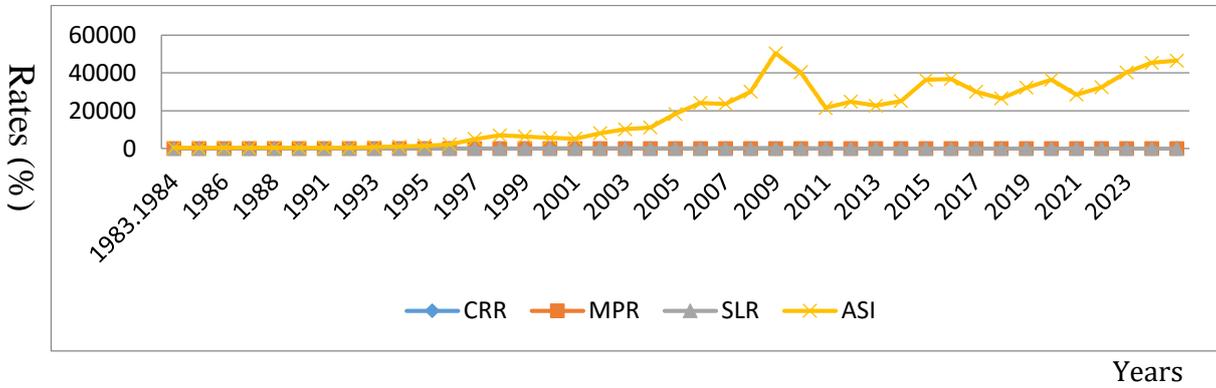


Figure 4.1 Trends of Log of All Share Index and Monetary Policy in Nigeria

Source: Extract from Results of Microsoft Excel, 2024

The trend analyses of Figure4.1 show that log of all share index (LOGASI) rallied above all monetary policy as from the year 1995. The monetary policy model indicators, including cash reserve ratio, monetary policy rate, and statutory liquidity rate maintained a stable trend throughout the study period. This suggests that all share index has not exerted any remarkable effect on monetary policy in Nigeria.

Table 1: Summary of Descriptive Statistics of the Study Variables

	MPR	ASI	TLE	VIT	VGS	EXR	INT
Mean	19.30286	18313.54	5789.914	388.2351	3556.306	129.3889	3.172540
Median	15.00000	18332.40	1325.700	98.40000	25.20000	120.9700	4.310290
Maximum	30.00000	50331.20	23168.00	2350.900	22161.20	460.7620	18.18000
Minimum	8.000000	430.9100	384.3000	0.090000	6.600000	0.760000	-15.92000
Std. Dev.	7.607175	16168.69	7375.798	575.5581	6548.857	130.1144	7.522836
Skewness	0.584075	0.381773	1.234626	1.696792	1.927521	1.137966	-0.142726
Kurtosis	1.644475	1.802678	3.272252	5.414958	5.302423	3.443977	2.828473
Jarque-Bera	4.669616	2.940849	8.999855	25.29980	29.40365	7.841433	0.161736
Probability	0.096829	0.229828	0.011110	0.000003	0.000000	0.019827	0.922315
Sum	675.6000	640974.0	202647.0	13588.23	124470.7	4528.612	111.0389
Sum Sq. Dev.	1967.550	8.89E+09	1.85E+09	11263081	1.46E+09	575611.9	1924.164
Observations	35	35	35	35	35	35	35

Source: Extract from Results of E-views 10, 2024

The statistics presented in Table 4.1 on the summary description of the variables used in the study were used to test for normality properties of residuals in the data set. To achieve this purpose, the study compared skewness values with the standard value of skewness of a symmetric distribution, such as normal distribution, which is zero. Results reveal that the skewness values for all the series were close to zero, suggesting that they were skewness normal. While the value of INT was skewed to the left since it was negative, those of LOGASI, LOGVIT, MPR, LOGTLE and LOGVGS were skewed to the right since their value were positive. This suggests that the series exhibit the characteristics of a normal distribution. The Kurtosis of a distribution which measures the peakness of the distribution that is assumed to be normal is 3.0. In Table 4.1, the series values did not depart substantially from the standard value of 3.0. Thus, the series do not exhibit characteristic of a distribution with a high peak and flat tails called leptokurtic ($k > 3$). They do not also have substantially flat-topped curves and thinner tails called platykurtic ($k < 3$), but they have generally exhibited mesokurtosis ($k = 3$) suggesting a normal distribution.

The standard rule is that the probability values of Jarque – Bera should be greater than 0.05 ($p > 0.05$). Results of Jarque – Bera show that the series failed to reject the null hypothesis of a normal distribution ($p > 0$) except INF. It is therefore, clear that the series are subject to distribution that is not different from the normal one.

From the results presented in Tale 1, there were 40 observation which represents the study period covering the time frame of 1983 – 2023. The standard deviations of all the variables were less than their mean values. This suggests that the data set were clustered and exhibit homogenous characteristics among the study variables. The implication of this is that there is no wide variation in the dataset used for each of the study variables. This is further confirmed from the median scores which lied within the central regions of the maximum and minimum of each variable, suggesting the absence of outliers in the dataset.

Unit Root Test Result

In order to ensure a stable trend of series and estimate its direction, unit root test was conducted to ascertain the stationary properties of the variables using Phillips Perron (PP) technique. The results of the unit root tests are presented in Table 2:

Table 2: Summary of Unit Root Test Result

Variable	PP Test Statistics	Critical Values	Order of Integration
MPR	-1.682627	-2.938987	I(1)
LOGASI	-1.433034	-2.936942	I(1)
LOGTLE	0.027936**	-2.926622	I(1)
LOGVIT	-1.709300	-2.936942	I(1)
LOGVGS	0.092262**	-2.936942	I(0)
INT	-3.892398**	-2.936942	I(1)

Note: The tests include intercept and trend; * significant at 1%; ** significant at 5%

Source: Authors Computation, 2024 (Eviews-10)

As shown in Table 4.8, results of PP test indicate that one of the variables (LOGVGS) was found stationary at levels and at 5% level of significance. However, the remaining five variables (MPR, LOGASI, LOGTLE, LOGVIT and INT) were stationary at first difference. Hence,

the unit roots PP test for the variables were accepted at levels for the four variables of interest. They were however, found to be stationary at level when considered at 5 percent level of significance. Thus, the study variables were found to integrate in a mixed order which satisfies the condition for using asymmetric bounds approach to co-integration test.

Table 3: Lag Length Criteria for the Monetary Policy Rate (MPR) Model

Dependent Variable: MPR		Column2	Column3	Column5	Column6	
Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specification
1	-67.916301	4.427908	5.037445	4.642798	0.619495	ARDL(3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
2	-68.982448	4.431484	4.997482	4.631025	0.613718	ARDL(2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)

Source: Extracts from E-views 12.0, 2023.**Note:** * Denoted the optimal lag length @ 5 % level of significance.

In Table 3, the most appropriate lag length was lag 3 based on the Akaike information criteria (AIC). This lag 3 was chosen in row one (3) with minimum value of 7.622295*. Therefore, the optimal lag length was lag 3 which was used to estimate NARDL Bound test, Normal NARDL, long-run and short-run results of the MPR model.

Table 4: Summary of Co-integration Estimates

F-Bounds Test		Null Hypothesis: No Levels Relationship			
Test Statistic		Value	Signif.	I(0)	I(1)
F—statistic		1.258871	10%	1.76	2.77
K		10	5%	1.98	3.04
			1%	2.41	3.61

Source: Authors Computation, 2024 (Eviews-10)

The coefficients of the Bounds co-integration presented in Table 4 indicated that at K (10=1.258871), which means that the coefficient falls below the lower bound, 1(0) of 1.98 and the upper bound 1(1) of 3.04. Thus, based on the decision, there is no co-integration between series. Thus, the error correction model (ECM) and log-run model could not be estimated. This necessitated the analysis of the lagged ARDL Regression short-run estimates.

Table 5: Short-run Estimates of the NARDL Regression Result using the MPR Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGASI_POS	-4.533396	4.560276	-0.994106	0.3305
LOGASI_NEG	2.294422	6.473959	0.354408	0.7263
LOGTLE_POS	-2.269628	2.923177	-0.776425	0.4454
LOGTLE_NEG	7.907166	5.333167	1.48264	0.1517
LOGVIT_POS	3.162897	2.102038	1.504681	0.146
LOGVIT_NEG	-3.216574	1.489741	-2.15915	0.0415
LOGVGS_POS	-0.498183	1.252554	-0.397733	0.6945
LOGVGS_NEG	-0.544608	3.227583	-0.168736	0.8675
INT_POS	-0.065905	0.084797	-0.777216	0.445
INT_NEG	-0.136868	0.138603	-0.987486	0.3337
C	11.01097	2.250122	4.893499	0.0001

Source: Authors Computation, 2024 (Eviews-10)

Results presented in Table 5 show that the -4.5 percent positive short-run effect of log of all share index had a corresponding 2.3 percent short -run negative effect on monetary policy rate. This implies that an increase in log of all share index leads to more than proportionate decrease in monetary policy rate in the short-run. Thus, all share index has contributed negatively to monetary policy rate. The negative short-run effect of log of all share index on monetary policy rate was however, not significant at 5% level ($p, 0.7263 > 0.05$). From the table, the -2.3 percent positive short-run effect of log of total listed equities had a corresponding 7.9 percent short-run negative effect on monetary policy rate, implying that log of total listed equities has contributed negatively to monetary policy rate. Again, the negative short-run effect of log of total listed equities on monetary policy rate was not significant at 5% level ($p, 0.1517 > 0.05$).

It was shown that, the 3.2 percent short-run positive effect of value of total transactions on monetary policy rate had a corresponding -3.2 % short-run negative effect on monetary policy rate. Thus, a change in log of value of total transactions leads to a proportionate change in monetary policy rate. This suggests that the positive and negative contributions of log of value of total transactions to monetary policy rate are same in the short-run, though the contribution was positively higher. The positive and negative effects of log of value of total transactions on monetary policy rate was not significant at 5% level ($p, 0.1460 > 0.05$ & $0.0415 > 0.05$, respectively). With respect to the log of value of government stocks, the table shows that the -0.4 percent positive short-run effect of the log of value of government stocks on broad money supply had a corresponding -0.5 % negative effect on monetary policy rate. Thus, an increase in log of value of government stocks leads to more than proportionate increase in monetary policy rate. This means that log of value of government stocks has contributed positively to monetary policy rate. The positive effect of log of value of government stocks on monetary policy rate was not significant at 5% level ($p, 0.8675 > 0.05$).

Results revealed that, the 0.05 percent positive short-run effect of interest rate on monetary policy rate had a corresponding -0.5 % negative short-run effect on monetary policy rate. Thus, an increase in interest rate leads to more than proportionate increase in monetary policy rate. This suggests that interest contributes positively to monetary policy rate. The positive short-run effect of interest rate was not significant ($p, 0.4450 > 0.05$).

NARDL Post-Estimation Diagnostic Tests Results

Robustness tests conducted in this study were Breusch-Godfrey-Serial-Correlation Test, Heteroscedasticity-ARCH Test, Ramsey RESET Test and Cumulative Sum (CUSUM) of Recursive Residuals Stability Test.

Table 4.12: Robustness (Test) Result

Test		Outcomes	
		Coefficient	Probability
Breusch-Godfrey-Serial-Correlation Test	F-stat.	0.01681	0.0810
Breusch-Pagan-Godfrey Heteroscedasticity Test	F-stat.	1.935859	0.0804
Ramsey RESET Test	F-stat.	1.061592	0.5063

Source: Extract from E-views 10.

The results of post-estimation test of NARDL model presented in Table 4.12 showed that there was no evidence of serial correlation and heteroscedasticity in the estimated model as the p-values of both (0.7008 and 0.1951) were found to be greater than 0.05. The result of Ramsey Reset test shows that the predicted value of the normalized NARDL regression was properly specified as the coefficients on all powers of the predicted were not jointly significant ($F= 1.06159, P = 0.5067$). Thus, the study model was linear; hence the set of probability distributions considered in the study included the distribution that generated the observed data. The study also examines the stability level of the model vis-à-vis the distribution of the observed data.

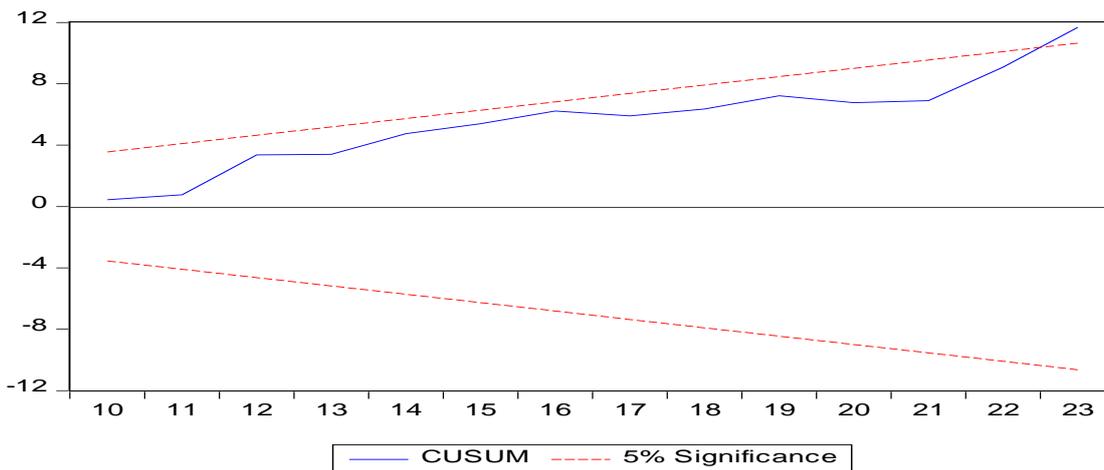


Figure 4.12: Cumulative Sum (CUSUM) of Recursive Residuals Stability Test.

The results of Recursive Residuals presented in Figure 4.12 indicated that the model is stable and the regression equation is correctly specified as the plot of the chart lies within the critical bounds at 5% significant level. Thus, the hypothesis of stability is not rejected, suggesting that the model was stable and hence suitable for estimation of data.

Tests of Hypotheses

In order to investigate the asymmetric properties of the variables under study, the asymmetry test was conducted using Wald Statistic for the CRR, MPR, SLR, RGDP, HDI and GFCF models. The null hypothesis of the test is that the decomposition of the study variables in partial sums of positive and negative changes in CRR, MPR, SLR, RGDP, HDI and GFCF is not significant (i.e. no asymmetries), and the alternative is that the decomposition of the changes is significant (i.e. there is asymmetries).

Table 4.34: Lagged Regression Results of the Asymmetry Wald Test

Variables	Wald Statistic	Evidence of Asymmetry
MPR	2.63185 (0.5913)	No

Note: The tests include intercept and trend; * *significant at 1%*; ** *significant at 5%*

Source: Authors Computation, 2024 (Eviews-10)

Ho1: Stock market performance has no significant effect on monetary policy rate in Nigeria. From the result of Wald test presented in Table 4.34, the stated null hypothesis is accepted ($t=2.63185$; $p, 0.5913 > 0.05$). This suggests that capital market performance has no significant effect on monetary policy rate in Nigeria.

Discussion of Findings

The study was prompted out of the desire to find out the implication of stock market performance for monetary policy rate in Nigeria. Specifically, the study analyzed the impacts of all share index, total listed equities, value of total transactions, and value of government stocks on monetary policy rate in Nigeria.

Results of the study showed that capital market performance has no significant effect on monetary policy rate in Nigeria. This suggests that capital market performance does not affect monetary policy rate in Nigeria. This finding disagrees with that conducted by Afful and Asiedu (2013) which showed a positive and significant relationship between fiscal policy and the spread and stock market activity.

Study findings revealed that capital market performance has significant effect on statutory liquidity ratio in Nigeria. This was expected because the Nigerian economy has witnessed rising inflation over the last three decades which apart from raising the prices of goods and services also reduces the level of disposal income available for investment. Hence, the liquidity ratio for the economy is expected to be influenced when capital market indicator change amidst rising prices. For most of the periods under review, inflation rate has been double digit thereby affecting consumption and investment including volume of trading activities at the Nigerian Exchange Group. The study finding agrees with that of In a related study, Ezirim, Muohgalu, Elike and Amuzie (2010) which reported that price increases significantly affect the reserve ratio, the stock market and public expenditure growth in Kenya and the United States of America.

Conclusion and Policy Recommendations

The study focuses on the performance of capital market and how it affects monetary policy rate. However, the study concluded that capital market performance has no significant effect on monetary policy rate in Nigeria.

On the basis of this conclusion, the study recommended as follows:

1. The continuous fall in the value of the local currency occasioned by rising exchange rate does not augur well for the capital market. Accordingly, government, through the apex bank should consider a stable currency value by developing policies to improve foreign exchange market stability. This may take the form of swinging currencies and lowering the monetary policy rate which is normally associated with the performance of all-share index and money market instruments such as Certificate of Deposit Issued, Notes and Deposit Certificates. These are the indices often targeted by foreign investors.
2. The government (Federal and State) should invest more in the capital market so as to improve the value of government stock (VGS) and use to profit to finance public welfare to improve the human development index (HDI) of Nigerians.

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