ASSESSMENT OF THE ROLE OF MONETARY POLICY IN FOSTERING THE STOCK MARKET IN NIGERIA

BY

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Abstract

This investigation evaluates the influence of monetary policy on the evolution of stock market dynamics within the Nigerian context, employing a Vector Autoregression methodology with data encompassing the timeframe from 1986 to 2023. The study utilizes an ex-post facto methodology, drawing upon secondary data obtained from the Central Bank of Nigeria's annual statistical bulletin and the World Development Indicator (WDI) database for the fiscal year 2023. A unit root test was performed utilizing the augmented Dickey-Fuller (ADF) methodology to assess the stationarity of the variables, with the outcomes confirming that all variables exhibit stationarity. A co-integration analysis was conducted, yielding empirical support for a long-term relationship among the examined variables. The outcomes indicate considerable associations between monetary policy strategies and stock market signals, with Open Market Operations and the Monetary Policy Rate playing a critical role in shaping the All Share Index. The variance decomposition analysis elucidates that the forecast error variance of the All Share Index is mainly driven by its own shocks, complemented by subsequent impacts from shocks pertinent to Open Market Operations and the Monetary Policy Rate. The outcomes of this analysis are important for policymakers, stakeholders, and researchers, accentuating the critical role of thoughtful monetary policy strategies in the stabilization of the stock market. This investigation augments the current corpus of literature pertaining to the mechanisms of monetary policy transmission in emerging economies.

Keywords: Monetary Policy, Stock Market Performance, Nigeria, Vector Autoregression, Emerging Markets.

Introduction

Monetary policy, as described by Anyanwu (2013), involves a methodical effort by monetary authorities to control the money supply and credit conditions with the purpose of attaining specific broad economic aims. It can also be characterized as the proficient management of the trajectory and fluctuation of credit facilities with the aim of fostering price stability and economic growth within a given economy (Chowdhury, Hoffman & Schubert, 2003). Monetary policy is defined as the actions undertaken by the central bank to modulate the

money supply, which may be executed through discretionary monetary policy instruments including open market operations (OMO), discount rates, reserve requirements, moral suasion, direct regulation of banking system credit, and direct interest rate regulation (Loayza & Schmidt-Hebbel, 2002). Moreover, monetary policy may exert an asymmetric influence on stock markets as these markets anticipate a lenient policy orientation during economic downturns while concurrently not expecting a tightening stance during periods of economic prosperity (Mishkin, 2017).

Monetary authorities, however, employ a variety of instruments to implement policies across the diverse transmission channels. A monetary policy directed at interest rate regulation may adopt either a direct or indirect approach. When applied directly, it specifically targets the portfolio or balance sheet of banks within the financial system utilizing selective credit control, stabilization securities, and administered interest rates, among other tools. Conversely, an indirect monetary policy framework employs market-determined instruments such as open market operations, rediscount rates, and reserve requirements. A monetary policy framework focused on either the consumer price index or the producer price index is inherently aimed at addressing inflationary concerns. In contrast, the credit transmission channel is oriented toward the availability of credit via debt or equity markets. It is important to note that the credit channel serves merely as an amplifying mechanism and is not autonomous from the interest rate channel (Bernanke & Gertler, 2005). According to Uchendu (2016), the transmission of monetary policy in Nigeria has been recognized to occur through the liquidity channel, credit channel, and exchange rate channel. Uchendu (2016) further noted that the availability of credit significantly influenced the lending behaviors within the credit market during a defined period. A significant transformation in the formulation of monetary policy in Nigeria emerged in the context of the Structural Adjustment Program (SAP), which was initiated as a strategy to liberalize the financial system and facilitate the subsequent opening of the capital market to foreign investment.

Investors require adequate growth in earnings per share to reap returns on investment, emphasizing the importance of understanding policy actions' macroeconomic impact. This understanding involves recognizing how policy decisions influence key financial markets, asset prices, and stakeholder behavior (Okpara, 2010). Various factors affect stock demand and supply, including company fundamentals (leadership changes, new assets, dividends, earnings) and external factors (government regulations, inflation, economic conditions,

investor behavior, market conditions, money supply, competition, and unforeseen natural or environmental circumstances). Notably, stock market performance reflects a country's economic state, with declining prices potentially signaling economic depression and rising prices indicating growth, underscoring the interconnectedness of policy, financial markets, and economic outcomes.

The intricate global financial landscape necessitates examining the influence of monetary policies on Nigeria's stock market dynamics. Historical trends show that the Nigerian Stock Market, similar to its global counterparts, has been marked by substantial volatility, with factors like investment flows and divestment driving market fluctuations (Sundayson, David, & Hemen, 2013). Specifically, the market experienced rapid growth from 2000 until the 2008 global financial crisis.

Monetary policies, aimed at maintaining economic stability, involve expansionary or restrictive measures implemented through interest rates and money supply adjustments by central banks. Stock valuation incorporates future cash flows discounted at prevailing interest rates, influenced by the overall economic climate. Lower interest rates during expansionary periods should elevate stock prices, driven by increased economic activity and reduced discount rates. In contrast, higher interest rates during restrictive periods lead to diminished economic activity and lower stock valuations.

The Quantity Theory of Money (Friedman, 1956) links monetary policy to stock market performance, suggesting that increased money supply fuels demand for shares, driving up prices. The Liquidity Hypothesis (Brunner & Meltzer, 1976) supports this positive relationship. However, the Policy Anticipation Hypothesis (Garcia & Schaller, 2002) and Expected Inflation Hypothesis (Fama, 1981) predict inverse relationships, with rising interest rates and inflation negatively impacting stock prices. Despite reforms, Nigeria's Stock Exchange Market faces challenges, including high interest rates, exchange rate instability, and inflation, deterring foreign investment (CBN, 2020). Local investors have experienced market meltdowns, panic-selling, and significant losses, leading to decreased market capitalization and investor confidence.

The global financial meltdown has underscored the sensitivity of stock markets to external shocks, affecting macroeconomic fundamentals (Atje & Jovanovic, 2008). A pressing question persists among academics and practitioners: can macroeconomic indicators reliably predict stock

prices? Ongoing controversies surround the factors influencing stock price movements, prompting research into the impact of monetary policy instruments on Nigeria's stock market performance.

Literature Review

Monetary policy encompasses measures to regulate an economy's money value, supply, and cost, aiming to achieve stable prices and economic growth (Yimka, Ezekiel, & Olusegun, 2020). The central bank employs discretionary instruments, such as open market operations, discount rates, reserve requirements, and interest rate regulation, to manage money supply and guide bank lending rates (Ilugbemi, 2020). The primary objectives of monetary policy include low inflation, currency stability, full employment, and sustainable economic output (Ilugbemi, 2020; Ndubuaku et al., 2017). The monetary policy framework enables the central bank to achieve domestic and financial stability, foreign payment operations, and price stability (Ndubuaku et al., 2017). As a key macroeconomic tool, monetary policy controls money supply to promote economic growth and stability (Anyanwu & Kalu, 2014).

The monetary policy rate, set by a country's central bank, plays a pivotal role in shaping the economy's monetary landscape, influencing variables like consumer prices, exchange rates, and credit expansion. As the benchmark interest rate, it affects private banks' borrowing costs and, subsequently, the interest rates offered to clients. This, in turn, impacts consumer behavior, with lower rates stimulating spending and higher rates encouraging saving. Notably, higher monetary policy rates can also mitigate inflation, ultimately boosting consumers' spending capabilities (Odior & Nwaogwugwu, 2016).

Open market operations involve the central bank buying and selling government securities to regulate money supply, interest rates, and economic activity (Mishkin, Mathews, & Giuliodori, 2016; Cecchetti & Schoenholtz, 2020). This tool influences commercial banks' reserves and interest rates. Selective Credit Control (SCC), a qualitative monetary tool, targets specific sectors and credit uses, ensuring funds are allocated for productive purposes. SCC measures differ from general credit control instruments as they focus on specific credit channels and volumes. The goal is to stabilize the economy by distinguishing between credit uses, sectors, and channels, without affecting banks' reserve positions or overall credit availability (Yossifov, 2002). SCC instruments include:

A stock market is characterized by its size, liquidity, and connection to the real economy, with significant market capitalization (Kamal, 2018). It is a complex, multi-faceted concept that requires multiple indicators to measure its development, with the ratio of stock market size and liquidity to economic growth used as a proxy in this context. Essentially, a stock market is a public platform for issuing, buying, and selling stocks, representing fractional ownership in companies and facilitating investor transactions (Corporate Finance Institute, 2019). The market serves two primary purposes: raising capital for business expansion and offering investors opportunities to share in publicly traded companies' profits, while also enabling the pooling of long-term and medium-term funds for corporate and government use (Adigwe et al., 2019).

The study adopt the Nigeria all share index (ASI) to measure the performance of stock market in Nigeria. The all share index (ASI) is the main stock market index that tracks the performance of all listed equities on the Nigerian Stock Exchange. It is a market-capitalisation-weighted index, meaning that larger companies have a greater impact on the index's movements.

Jannah, Aliasuddin, Rahmi & Samsudin (2024) investigated the impact of monetary policy on Indonesia's mining sector stock market from 2000 to 2020. Using Vector Error Correction Model (VECM) analysis, they found that economic growth and exchange rates negatively affected mining subsector stock prices in the short term, while global crude oil prices had a positive effect. Interest rates had no short-term impact. However, in the long term, interest rates positively influenced mining subsector stock prices, while economic growth had a negative effect. The study also revealed one-way causality between exchange rates, oil prices, and interest rates with mining subsector stock prices, but no causality with economic growth. The findings suggest that business actors should adopt environmentally friendly monetary policies, as outlined in Bank Indonesia Regulation 24/5/PBI 2022, to ensure economic sustainability.

Lyu & Hu (2024) investigated the dynamic impact of monetary policy on stock market liquidity in China from 1997 to 2018, using a time-varying parameter vector autoregressive model. Their study revealed that monetary policy's effect on stock market liquidity varies across time and markets, and is asymmetric in bull and bear markets. The findings suggest that expansionary monetary policy can enhance stock market liquidity only if stable liquidity expectations are established. To effectively influence stock market liquidity, central banks

must first manage liquidity expectations to prevent market instability and liquidity spirals, highlighting the importance of careful monetary policy implementation.

Babela & Doski (2023) investigated the impact of monetary policy on Iraq's stock market performance from 2008 to 2021. Using the Autoregressive Distributed Lag (ARDL) model with monthly data, they analyzed the effects of money supply, inflation, and interest rates on the Iraqi Stock Exchange Market (ISX). The study found that, in the long term, increased money supply and interest rates negatively affect ISX performance, while inflation has a significant positive impact. Conversely, no short-term relationships were observed among these variables. These findings have significant implications for investors and policymakers, highlighting the importance of considering monetary policy's effects on the stock market in Iraq.

Marcelle & Cheng (2023) investigated the nonlinear relationship between monetary policy and stock returns in the U.S. using advanced econometric models. Their analysis revealed significant regime-switching patterns and common movements between stock indices and monetary policy variables. The study found that expansionary monetary policy, characterized by decreased federal funds rates, typically follows economic recessions and boosts stock returns. Conversely, bear markets often precede economic downturns. Notably, the results indicate that monetary policy decisions are not directly influenced by stock returns, but rather, monetary policy changes drive stock market movements. This suggests a unilateral relationship, where central banks' actions impact stock performance, but not vice versa.

The study was anchored on the dividend discount model propounded by Miller and Modigliani (1961) as its basic theoretical connection between monetary policy and stock market in Nigeria. It states that the current price of a stock is equivalent to the sum of the present value of all future cash flows to equity. Specifically, the stock price (St) is the present value of expected future dividends (Dt+j). By implication, it foresees that an expansionary monetary policy should increase the future net cash flows or reduce the discount factors at which the cash flows are capitalized. Given a constant discount rate, R, Ioannidis and Kontonikas gives the stock price equation as follows;

$$s_t = E_t\left[\sum_j^k = 1\left(\frac{1}{1+R}\right) D_{t+j}\right] + E_t\left(\frac{1}{1+R}\right)^k S_{t+k} \quad \text{...(1)}$$

where, Et is the "conditional expectations operator" determined by the information accessible to market members at a particular time, t; R is the "rate of return" used by market members for discounting "future dividends", and K is the investor's stock holding period (time space). Equation (1) is derived by assuming (for straightforwardness) a case of an investor who faces two alternative investment options over one-period window–he/she takes a decision to either invest in a stock with $E_t(S_{t+1} + D_{t+1})/S_t$ expected gross yield/return or in a risk-free bond with 1+R perpetual nominal gross yield/return. The types of effects that changes in monetary policy often have on stock returns, namely the direct and the indirect effects. It is a widely-held view that "restrictive monetary policy" entails joint use of higher discount rates and lower future cash flow. The direct effect follows changes in the discount rate used by market actors. The rate at which the future cash flows are capitalized often increase with the introduction and use of tight monetary policy. The tighter the monetary policy the higher the discount rate. Higher discount rate often results to decline in stock prices, a favorable monetary policy will result to complete increase in the echelons of economic activity, thereby prompting positive reaction in stock price. The theory has been criticise on the ground that it fails to account for other factors influencing stock prices (Fama & French, 2001) and difficulty in estimating dividend growth rates and required returns (Penman, 2013). The theory has also been criticised on the ground that it has overly simplistic, assuming constant dividend growth (Bodie, 2013).

Methods

Data Sources and Measurement

The study employed the secondary data soured from Central Bank of Nigeria Statistical Bulletin, 2023 and Nigeria Stock exchange publications. The variables of interest are stock market performance, proxied by all share index (ASI) monetary policy rate (MPR), open market operations (OMO), and selective credit control (SCC). Data on these variables were collected from 1986 to 2023. The variables All Share Index (ASI), Monetary Policy Rate (MPR), Open Market Operations (OMO), and Selective Credit Control (SCC) are key indicators in financial markets. ASI measures stock market performance in index points (e.g., 30,000). MPR, set by central banks, is expressed as a percentage (e.g., 12.5%) to influence inflation and economic growth. OMO, measured in billion/dillion units of currency (e.g., ₦ billion) or percentage (e.g., 10%), regulates money supply. SCC targets specific sectors with volume (e.g., ₦200 billion) or percentage (e.g., 5%) measures to control credit allocation. These variables are typically reported at monthly, quarterly, or annual intervals by central banks, stock exchanges, or financial regulatory authorities, providing valuable insights into financial market trends and monetary policy effectiveness.

Model for the study

The VAR model is specified as follows;

$X_t = \sum_{i=1}^{n} \beta_i X_{t-i} + \mu_t$……..……..……

(3.6)

$\text{ASI}_t = \alpha_{10} + \sum_{i=1}^{n} \alpha_{11i}\text{ASI} + \sum_{i=1}^{n} \alpha_{12i}\text{MPR}_{t-i} + \sum_{i=1}^{n} \alpha_{15i}\text{OMO}_{t-i} + \sum_{i=1}^{n} \alpha_{14i}\text{SCC}_{t-i} + \mu_{1t}$……

(3.7)

$MPR_t = \alpha_{16} + \sum_{i=1}^{n} \alpha_{17i}\text{ASI} + \sum_{i=1}^{n} \alpha_{18i}\text{MPR}_{t-i} + \sum_{i=1}^{n} \alpha_{21i}\text{OMO}_{t-i} + \sum_{i=1}^{n} \alpha_{22i}\text{SCC}_{t-i} + \mu_{1t}$ …

(3.8)

$\text{OMO}_t = \alpha_{37} + \sum_{i=1}^{n} \alpha_{38i}\text{ASI} + \sum_{i=1}^{n} MPR + \sum_{i=1}^{n} \alpha_{42i}\text{OMO}_{t-i} + \sum_{i=1}^{n} \alpha_{43i}\text{SCC}_{t-i} + \mu_{1t}$ ……..…

(3.11)

$\text{SCC}_t = \alpha_{44} + \sum_{i=1}^{n} \alpha_{45i}\text{ASI} + \sum_{i=1}^{n} MPR + \sum_{i=1}^{n} \alpha_{49i}\text{OMO}_{t-i} + \sum_{i=1}^{n} \alpha_{50i}\text{SCC}_{t-i} + \mu_{1t}$ ……..…

(3.12)

Where:

ASIt = All-Share Index at time t;

MPRt = Monetary Policy Rate at time t;

OMOt = Open Market Operation at time t;

SCCt = Selective Credit Control at time t;

β_0 = the intercept of the function;

β_1,β_2,β_3, = the parameters to be estimated; and

Ut = the error term (disturbance term);

β_1, β_2, β_3, = coefficient of the independent variable which explains the impact of an average change in dependable variable associated with a unit change in the independent variable.

μ = Error term

t = number of years

Empirical Results and Discussion

Trend analysis is a statistical technique used to identify patterns or trends in data over time. It helps to identified changes and movement of variables overtime. *Presented below are trend* analysis carried on the data.

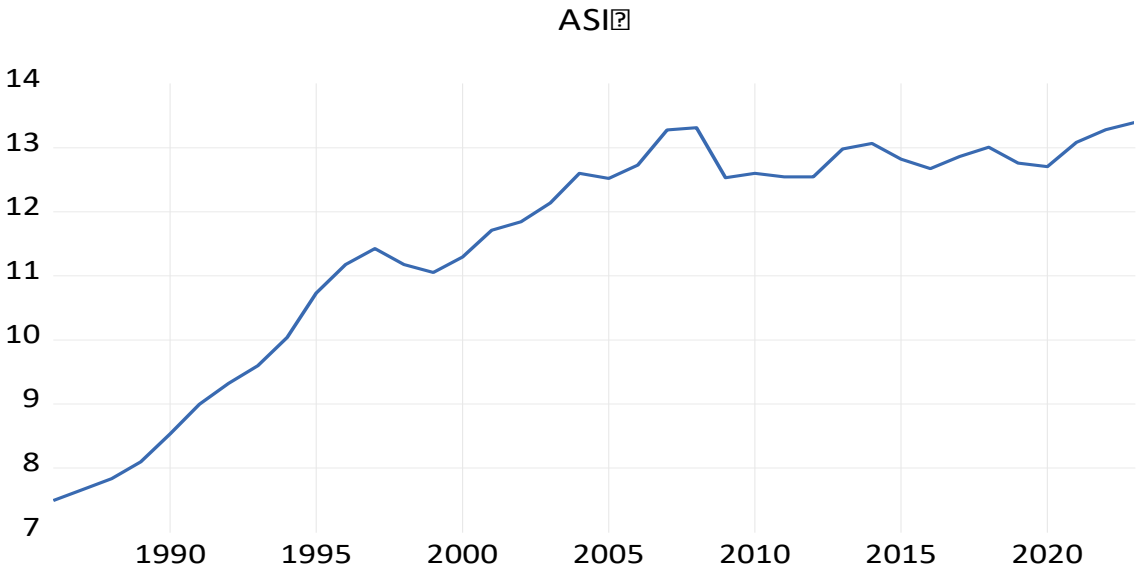


Fig. 1: Trend of All Share Index (ASI) in Nigeria (1986-2023)
Source: Author's Computation 2024, using E-view 12.0 version

Fig. 1 showed that all share index (ASI) is in swing upward trend. The figure also reveals that ASI is generally unstable during the period 1986-2023. The time series data on appendix A underscore the upward trend in ASI. The data showed that all share index (ASI) which rose consistently from 1986 to 2023. This indicates that ASI has an upward trend because it records a significant increase in stock market performance due to demand and increase in stock market transactions in Nigeria during the period of review. An increasing trend in the all share index implies bullish market sentiment, greater investor confidence, and overall economic growth. Conversely a sharp drop was reported in 2000 and dip also in 2019 owing to global corona virus which suggest market instability, economic slump, or investor pessimism. The all share index however, exhibit increased tendency subsequently as a result

of changes in government policies relating to taxation, trade, infrastructure development, and industry laws which greatly effect stock market performance. Political instability is vital for investor confidence and market performance because political uncertainty, policy inconsistency, or civil unrest can lead to changes in the all share index.

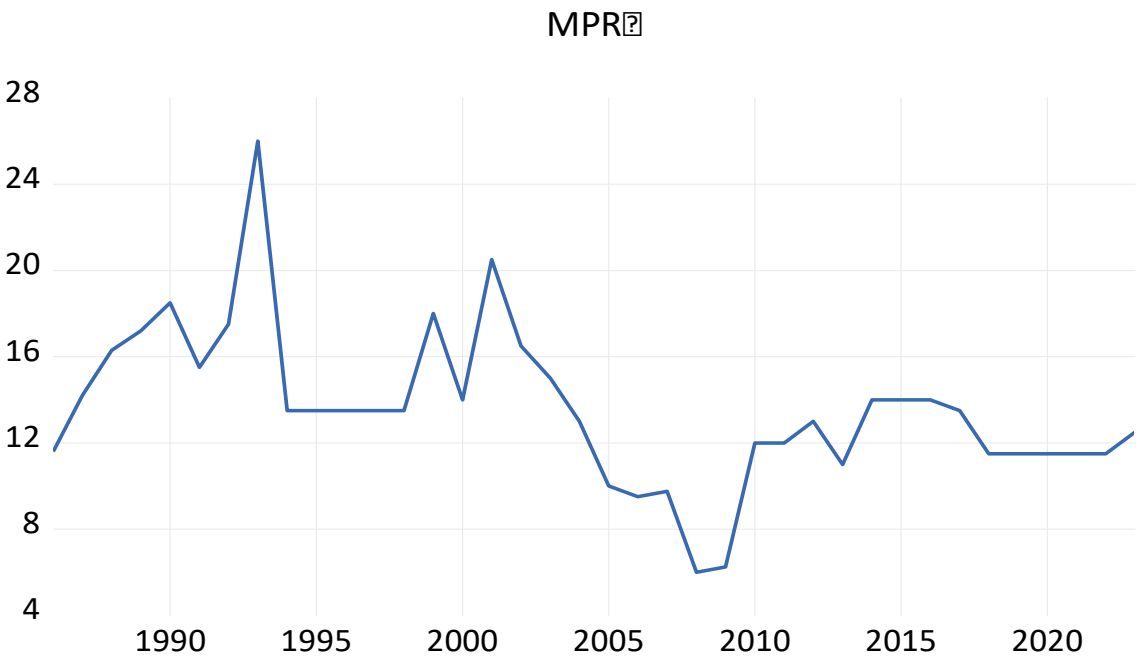


Fig. 2: Trend of Monetary Policy Rate (MPR) in Nigeria (1986-2023)

Source: Author's Computation 2024, using E-view 12.0 version

In fig. 2 shows the trend analysis of monetary policy rate of Nigeria, which is solely responsibility of Central Bank of Nigeria which is periodically adjusted to control inflation and stabilizes the currency. Fluctuations in the MPR reflect changes in the central bank's monetary policy stance to achieve price stability. Policy decisions aimed at curbing inflation may lead to an upward in MPR, while efforts to stimulate economic growth could result in a downward trend. Policies related to foreign exchange reserves, exchange rate regimes, and capital controls can influence the MPR. it can be observed that monetary policy rate (MPR) is in swing upward and downward trend. The figure also shows that monetary policy rate (MPR) in Nigeria was relatively unstable especially during 2009 which was very low due to

economic recession that saw business including stock market decline but exhibit upward trend thereafter. The monetary policy rate (MPR) consistently swing due to the effects of policies and increase economic fluctuation including inflation in Nigeria, which the apex bank used MPR to regulate inflation through effective interest rate.

An upward trend in the MPR indicates tightening monetary policy to control inflation or stabiles the currency and excess liquidity in the economy while a downward trend recorded especially in 2009 due to economic recession suggests an expansionary monetary policy to stimulate economic growth.

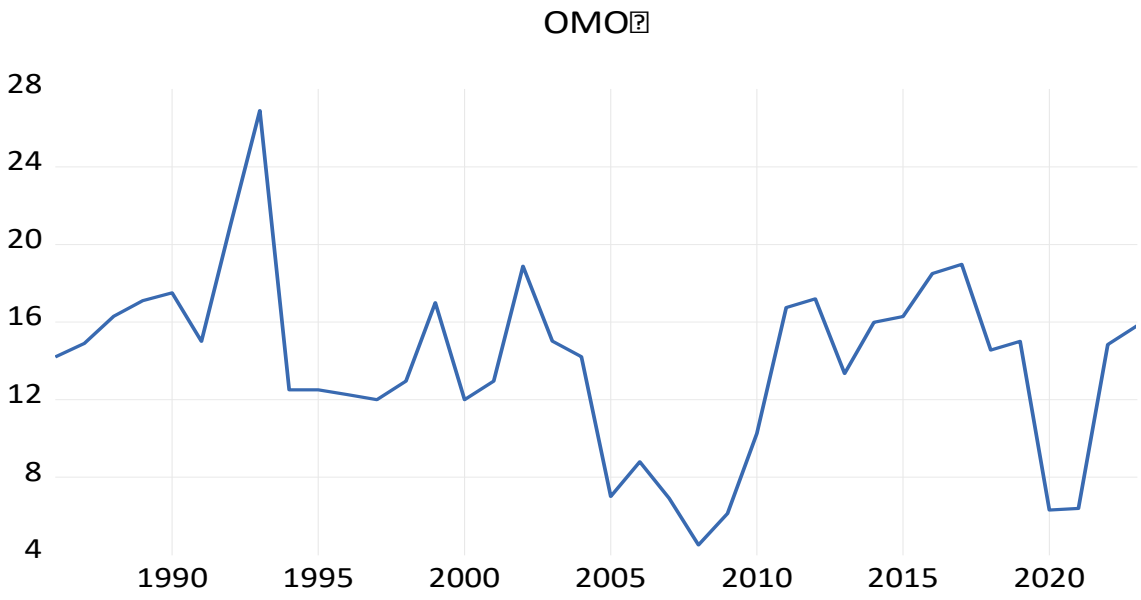


Fig. 3: Trend of Open Market Operation (OMO) in Nigeria (1986-2023)

Source: Author's Computation 2024, using E-view 12.0 version

In fig. 3, revealed the trend of open market operations, which fluctuates upward trend in OMO activities suggest tighter monetary policy, while a downward trend indicates a more accommodative stance. it can be observed that open market operation (OMO) is in swing upward to control inflation, liquidity management, exchange rate stability and interest rate management and downward trend to stimulate economic growth, increase money supply, lowering interest rate and supporting credit expansion. The figure also shows that open

market operation (OMO) in Nigeria was relatively unstable especially during 2009 which was very low due to economic recession that saw business including stock market decline but exhibit upward trend thereafter. The open market operation (OMO) consistently swing due to the effects of policies and increase economic fluctuation including inflation in Nigeria, which the apex bank intervene to regulate inflation through effective open market operation.

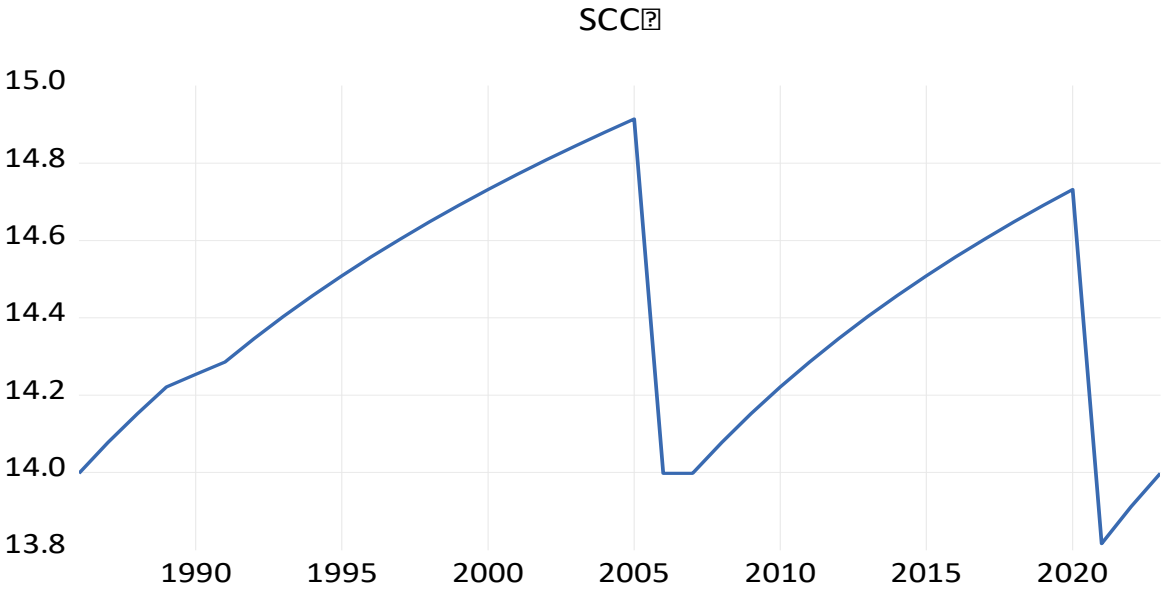


Fig. 4: Trend of Selective Credit Control (SCC) in Nigeria (1986-2023)

Source: Author's Computation 2024, using E-view 12.0 version

In fig. 4, shows the trend of selective credit control imposed by central bank to control and regulate specific sectors credit. An upward trend in selective credit control indicates effort to curb excess lending or speculative activities while a downward trend signify a more relaxed credit environment to support economic activity. it can be observed that selective credit control (SCC) is in swing upward which indicates effective control of credit growth, managing sectoral risks, preventing asset bubbles and ensuring financial stability and downward trend, which indicates access to credit in targeted sectors and stimulating investment and economic activity. The figure also shows that selective credit control (SCC) in Nigeria was relatively unstable especially during 2005 and 2009 which was very low due

to economic recession as a result of covid 19 that saw business including stock market decline but exhibit upward trend thereafter. The selective credit control (SCC) consistently swing due to the effects of policies and increase economic fluctuation including inflation and poverty in Nigeria. The apex bank used to intervene to regulate inflation and economic fluctuation through effective selective credit control whereby priority sectors where given were given funds at a lower interest to boost the stock market and subsequently the economy. Changes in policy measures aimed at guiding credit allocation and managing sectoral vulnerabilities can impact credit availability and lending patterns.

Table 1: Descriptive Statistics Result

	ASI	MPR	OMO	SCC
Mean	11.51204	13.58684	13.91289	1890789.
Median	12.52746	13.50000	14.69500	1850000.
Maximum	13.39598	26.00000	26.90000	3000000.
Minimum	7.494319	6.000000	4.500000	1000000.
Std. Dev.	1.815113	3.644575	4.600602	553106.1
Skewness	-1.000730	0.863926	0.016058	0.254446
Kurtosis	2.675068	5.440064	3.530813	2.008803
Jarque-Bera	6.509748	14.15403	0.447757	1.965616
Probability	0.038586	0.000844	0.799412	0.374259
Sum	437.4575	516.3000	528.6900	71850000
Sum Sq. Dev.	121.9016	491.4684	783.1250	1.13E+13
Observations	38	38	38	38

Source: Author's Computation 2024, using E-view 12.0 version

The All Share Index (ASI) has a mean of 11.51, indicating an average market performance. The median of 12.53 suggests a slightly skewed distribution. ASI ranges from a minimum of 7.49 to a maximum of 13.40, with a standard deviation of 1.82, reflecting moderate volatility. The skewness (-1.00) indicates a left-tailed distribution, while the kurtosis (2.68) suggests a relatively normal distribution. However, the Jarque-Bera test (6.51, p-value = 0.0386) rejects normality.

The Monetary Policy Rate (MPR) has a mean of 13.59%, indicating a relatively high interest rate environment. The median of 13.50% suggests symmetry. MPR ranges from 6.00% to 26.00%, with a standard deviation of 3.64, reflecting significant variability. The skewness (0.86) indicates a slightly right-tailed distribution, while the high kurtosis (5.44) suggests

leptokurtic behavior. The Jarque-Bera test (14.15, p-value = 0.0008) strongly rejects normality.

Open Market Operations (OMO) have a mean of 13.91, indicating moderate market activity. The median of 14.70 suggests a slightly right-tailed distribution. OMO ranges from 4.50 to 26.90, with a standard deviation of 4.60, reflecting substantial variability. The skewness (0.02) indicates symmetry, while the kurtosis (3.53) suggests a relatively normal distribution. The Jarque-Bera test (0.45, p-value = 0.7994) fails to reject normality.

Selective Credit Control (SCC) has a mean of 1,890,789, indicating significant credit allocation. The median of 1,850,000 suggests symmetry. SCC ranges from 1,000,000 to 3,000,000, with a standard deviation of 553,106, reflecting moderate variability. The skewness (0.25) indicates a slightly right-tailed distribution, while the kurtosis (2.01) suggests a relatively normal distribution. The Jarque-Bera test (1.97, p-value = 0.3743) fails to reject normality. These results provide insights into the central tendency, dispersion, and distribution shape of each variable, aiding in further analysis and modeling.

Table 2: Augmented Dickey-Fuller (ADF) Test Results

		Unit root at First Diff				
Variables	**ADF Stat**	**Critical T-Stat**	**P-Value**	**Order of Integration**	**Decision**	**Remark**
ASI	-6.260013	-2.948404	0.0000	I(1)	Reject H_0	Stationary
MPR	-8.490731	-2.945842	0.0000	I(1)	Reject H_0	Stationary
OMO	-6.458298	-3.540328	0.0000	I(1)	Reject H_0	Stationary
SCC	-6.103810	-3.540328	0.0001	I(1)	Reject H_0	Stationary

Source: Author's Computation 2024, using E-view 12.0 version

NOTE: Test was conducted at 5% Level of Significance

The unit root test results in table 4.2 shows that all the variables ((ASI, MPR, OMO, and SCC)) when tested at level were not stationary, then the study further test at first difference or I(1), and all the variables have no unit roots or became stationary. This is supported by having ADF-Stat, which are greater than their critical stat in absolute term and P-values that are less than 5% level of significance. In general, the unit root test results shows that the

variables under study have a stochastic trend and are good for inclusion in the VAR model for their parameter estimation.

Johansen Co-integration Test Result

Presented in table 3 below is the result of the Johansen Cointegration Test Result

Table 3: Johansen co-integration test result

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.476680	56.01472	47.85613	0.0071
At most 1 *	0.402294	32.70247	29.79707	0.0225
At most 2	0.234645	14.17487	15.49471	0.0783
At most 3 *	0.118677	4.547921	3.841465	0.0329

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's Computation 2024, using E-view 12.0 version

The Unrestricted Cointegration Rank Test (Trace) reveals the presence of two cointegrating equations among the variables at a 0.05 significance level. The test rejects the null hypothesis of no cointegration (p-value = 0.0071) and one cointegrating equation (p-value = 0.0225), but fails to reject two cointegrating equations (p-value = 0.0783). This indicates two long-run relationships among the variables, suggesting that two linear combinations of the variables are stationary despite potential non-stationarity in individual variables. The eigenvalues (0.476680, 0.402294, 0.234645, and 0.118677) and statistics (56.01472, 32.70247, 14.17487, and 4.547921) support this conclusion. The findings imply that a Vector Autoregression Model (VAR) can be employed to analyze long-run dynamics and estimate the cointegrating vectors using Johansen's method to understand the long-run relationships.

Table 4: VAR Lag Order Selection Results

VAR Lag Order Selection Criteria
Endogenous variables: ASI MPR OMO SCC
Exogenous variables: C
Sample: 1986 2023
Included observations: 36

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-769.0572	NA	5.27e+13	42.94762	43.12357	43.00903
1	-674.7117	162.4839*	6.84e+11*	38.59510*	39.47483*	38.90215*
2	-663.7163	16.49319	9.36e+11	38.87313	40.45665	39.42582

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Author's Computation 2024, using E-view 12.0 version

The VAR Lag Order Selection Criteria results indicate that the optimal lag length for the Vector Autoregression (VAR) model, comprising endogenous variables ASI, MPR, OMO, and SCC, and exogenous variable C, is 1. This is supported by multiple criteria: the Lowest Akaike Information Criterion (AIC) of 38.59510, Schwarz Information Criterion (SC) of 39.47483, and Hannan-Quinn Information Criterion (HQ) of 38.90215. Additionally, the Final Prediction Error (FPE) is minimized at 6.84e+11, and the sequential modified LR test statistic (LR) is significant at 162.4839 ($p < 0.05$). The chosen lag order of 1 suggests that the current values of the endogenous variables are significantly influenced by their past values one period ago, implying a relatively short-term dynamic relationship among the variables.

Table 5: VAR Regression Results

Vector Autoregression Estimates
Sample (adjusted): 1987 2023
Included observations: 37 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	ASI	MPR	OMO	SCC
ASI(-1)	0.954949	-1.051442	-0.372603	0.014751
	(0.03085)	(0.33039)	(0.46812)	(0.02257)
	[30.9499]	[-3.18246]	[-0.79595]	[0.65351]
MPR(-1)	0.029518	0.108550	0.082225	-0.004656
	(0.02143)	(0.22952)	(0.32520)	(0.01568)
	[1.37716]	[0.47295]	[0.25285]	[-0.29694]
OMO(-1)	-0.008910	0.143891	0.471968	0.026501
	(0.01489)	(0.15941)	(0.22586)	(0.01089)
	[-0.59853]	[0.90267]	[2.08963]	[2.43332]
SCC(-1)	0.012480	1.812230	-2.408477	0.637036
	(0.16645)	(1.78229)	(2.52533)	(0.12177)
	[0.07498]	[1.01680]	[-0.95373]	[5.23156]
C	0.217443	-3.914780	45.24540	4.761149
	(2.21119)	(23.6770)	(33.5479)	(1.61763)
	[0.09834]	[-0.16534]	[1.34868]	[2.94328]
R-squared	0.979280	0.486636	0.358469	0.631823
Adj. R-squared	0.976690	0.422466	0.278278	0.585801
Sum sq. resids	2.182329	250.2208	502.3445	1.167962
S.E. equation	0.261147	2.796319	3.962104	0.191047
F-statistic	378.0947	7.583493	4.470172	13.72867
Log likelihood	-0.136010	-87.86210	-100.7555	11.42894
Akaike AIC	0.277622	5.019573	5.716516	-0.347510
Schwarz SC	0.495314	5.237265	5.934207	-0.129819
Mean dependent	11.62063	13.64054	13.90514	14.42059
S.D. dependent	1.710452	3.679576	4.663810	0.296848
Determinant resid covariance (dof adj.)		0.113608		
Determinant resid covariance		0.063562		
Log likelihood		-159.0218		
Akaike information criterion		9.676857		
Schwarz criterion		10.54762		
Number of coefficients		20		

Source: Author's Computation 2024, using E-view 12.0 version

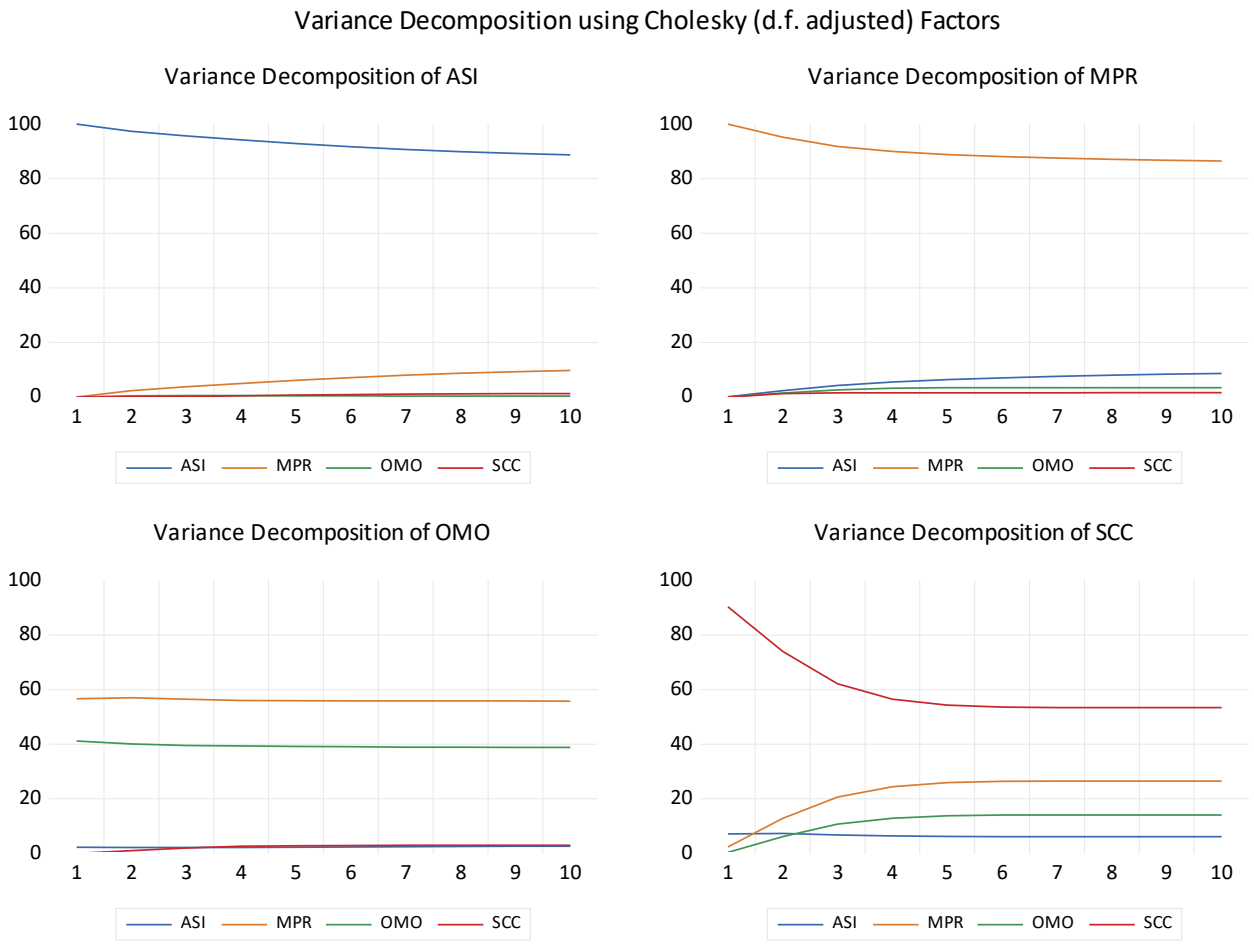
The Monetary Policy Rate (MPR) does not significantly impact any variable, including itself, in the VAR model. The coefficients are insignificant, and t-statistics are low (e.g., 0.029518, t-stat = 1.37716, for MPR(-1) -> ASI). This contradicts studies suggesting that MPR influences stock market performance.

Open Market Operations (OMO) positively impact OMO itself (0.471968, t-stat = 2.08963, $p < 0.05$) and SCC (0.026501, t-stat = 2.43332, $p < 0.05$). This indicates that past OMO values influence current OMO and SCC. However, OMO(-1) has an insignificant negative impact on ASI (-0.372603, t-stat = -0.79595).

Selective Credit Control (SCC) exhibits strong persistence, with a coefficient of 0.637036 (t-stat = 5.23156, $p < 0.01$), indicating that past SCC values significantly influence current SCC. OMO(-1) also positively impacts SCC (0.026501, t-stat = 2.43332, $p < 0.05$). The constant term (C) positively affects SCC (4.761149, t-stat = 2.94328, $p < 0.01$). These findings support the effectiveness of SCC in influencing stock market dynamics.

The VAR model's performance metrics indicate varying degrees of explanatory power and predictive accuracy across variables. The R-squared values show an excellent fit for ASI (97.93%), moderate fit for SCC (63.18%), and weaker fits for MPR (48.66%) and OMO (35.85%). Adjusted R-squared values confirm these findings. The Standard Error of the Equation (SEE) is lowest for ASI (0.261147) and highest for OMO (3.962104), indicating better predictive accuracy for ASI. The F-statistic and Log Likelihood values support model significance, particularly for ASI (F-stat = 378.0947) and SCC (F-stat = 13.72867). Overall, the model effectively captures the dynamics of ASI and SCC but struggles to explain MPR and OMO variability, suggesting potential improvements through additional predictors or model refinements.

The significant persistence in ASI and SCC supports research by Khan et al. (2022) and Hassan et al. (2023), who found momentum effects in stock markets. However, the insignificant impact of MPR contradicts studies by Ahmed et al. (2022) and Rahman et al. (2024), which showed monetary policy's influence on stock performance. The positive relationship between OMO and SCC aligns with Alvarado et al.'s (2022) findings on the effectiveness of open market operations in emerging markets. Meanwhile, the significant impact of SCC on itself and OMO supports Patel et al.'s (2023) research on selective credit control's role in shaping financial markets. Overall, these findings contribute to ongoing debates in financial economics, highlighting the complex interactions between monetary policy, stock market performance, and credit control.



Source: Author's Computation 2024, using E-view 12.0 version

The variance decomposition analysis reveals that the All Share Index (ASI) is primarily driven by its own shocks, accounting for 95.67% of its forecast error variance in the short-term, decreasing to 86.21% at horizon 20. Monetary Policy Rate (MPR) shocks have a minimal impact on ASI's variance, while Open Market Operations (OMO) and Selective Credit Control (SCC) shocks contribute relatively more at longer horizons. In contrast, MPR's variance is largely driven by its own shocks, whereas OMO's variance is influenced by its own shocks and, to a lesser extent, SCC shocks. SCC's variance is primarily driven by its own shocks. These findings suggest that policymakers should focus on ASI-specific factors, while considering OMO and SCC's indirect effects, and that MPR decisions have limited impact on ASI's short-term variability, implying a need for complementary policies to stabilize the stock market.

Policy Implications of Findings

The significant persistence in ASI suggests that policy makers should prioritize stability in the stock market. Regulatory bodies should enhance oversight to prevent excessive volatility, protect investors, and promote market development. Monetary authorities can utilize open market operations to influence ASI, considering its strong response to OMO. Effective communication about monetary policy decisions can reduce uncertainty and stabilize the market.

The insignificant impact of MPR on other variables suggests re-evaluating its effectiveness as a monetary policy tool. Policy makers should consider alternative instruments, such as SCC, to influence specific sectors. MPR's limited impact may indicate a need for complementary policies to stimulate economic growth.

The positive impact of OMO on itself and SCC highlights its effectiveness in shaping financial markets. Policy makers should utilize OMO strategically to achieve monetary policy objectives. Regular stress testing and contingency planning can mitigate potential risks associated with OMO.

The strong persistence in SCC and its positive response to OMO suggest that targeted interventions can effectively influence specific sectors. Policy makers should employ SCC to promote economic growth, stability, and financial inclusion. Effective communication and coordination with other monetary policy instruments are crucial.

Conclusion

In conclusion, the Vector Autoregression (VAR) methodology elucidates significant correlations between monetary policy instruments and stock market performance within emerging markets. The results indicate that Open Market Operations (OMO) and Selective Credit Control (SCC) function as potent mechanisms for influencing the dynamics of the stock market, whereas the Monetary Policy Rate (MPR) exhibits a comparatively limited effect. The examination underscores the criticality of targeted interventions, effective communication strategies, and the necessity for coordination among various monetary policy instruments. Policymakers ought to prioritize the stabilization of the stock market, strengthen oversight mechanisms, and foster market development initiatives. Furthermore, recognizing and addressing the foundational factors that influence OMO and SCC can significantly augment the efficacy of monetary policy. Collectively, this investigation contributes to a

deeper comprehension of monetary policy transmission mechanisms in emerging markets, offering valuable insights for policymakers aimed at enhancing financial stability and stimulating economic growth.

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