

MODERATING EFFECT OF MONETARY POLICY RATE ON FINANCIAL DEEPENING-CAPITAL MARKET DEVELOPMENT NEXUS IN NIGERIA

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Abstract

Financial deepening as an aspect of financial development is expected to stimulate the growth of financial assets relative to the size of the economy and in turn facilitate capital market development. However, opportunity cost of money (in the form of monetary policy rate) could affect the effectiveness of financial deepening in stimulating capital market development in Nigeria. Therefore, this study investigated whether monetary policy rate enhances or reduces the effect of financial deepening on capital market development in Nigeria from 1981 to 2023. Annual time series data obtained from Central Bank of Nigeria's Statistical Bulletin were analysed using Autoregressive Distributed Lag (ARDL) regression technique. While capital market development was measured as market capitalization ratio (ratio of capital market capitalization to gross domestic product), this study also measured financial deepening using monetization ratio (money supply/gross domestic product ratio) and credit to private sector/gross domestic product ratio. The study found that monetary policy rate reduces the

negative effect of credit to private sector/gross domestic product ratio on market capitalization ratio in both short- and long-run in Nigeria. However, when examined using the monetization ratio, monetary policy rate hampers the positive effect of financial deepening on market capitalisation ratio in Nigeria in both long-run and short-run. The study therefore concludes that monetary policy rate significantly moderates the financial deepening-capital market development nexus in Nigeria. Therefore, there is the need for the Central Bank of Nigeria to use the tool of monetary policy rate with caution by taking cognizance of its significant role in the economics of capital market development in Nigeria.

Keywords: *Moderating Effect, Monetary Policy Rate, Financial Deepening, Monetization Ratio, Credit, Private Sector, Market Capitalization, Capital Market Development*

Introduction

A capital market is an institutional arrangement that facilitates dealing in shares, stocks, bonds, debentures, loan stocks, treasury bills, shares, derivatives, and other securities. A well-functioning capital market assists in price discovery, liquidity provision, reduction in transactions costs, and risk transfer (Charles & Uford, 2023), which ultimately increase economic efficiency, investment and growth (Anyamaobi & Okey-Nwala, 2023). The capital market has been regarded as an engine room of economic growth (Babarinde & Enoruwa, 2021). The development of capital market thus refers to the efficiency of the market in mobilizing and allocating capital towards the attainment of economic growth and development (Nwokoye & Out, 2018).

To develop the capital market is to deepen the financial market generally, since the former is part of the latter. Financial deepening is the extent to which sectors and agents are able to use a range of financial markets for savings and investment decisions (Anyamaobi & Okey-Nwala, 2023). Financial deepening is important in that it leads to expansion in financial products and services, thereby resulting in financial development, in terms of depth and size of the financial sector (Babarinde, & Enoruwa, 2021). It also plays an essential role in economic saving mobilization; broadens resource base; raises the capital needed to stimulate investment through savings and credit (Uford & Joseph, 2019); and boosts its overall productivity, ultimately promoting economic growth (Attah-Botchwey et al., 2022). Thus, adequate financial deepening is a necessity for both financial and real sector growth and development (Okeya & Dare, 2020).

In the financial market generally, and in capital market specifically, market participants do engage in cost-benefit analysis while entering or exiting the market (Uford, 2017). This implies that, the decision of market participants to hold or dispose assets relies heavily on monetary policy pronouncements and the outcome

of the committee meetings (Mba et al., 2019). Furthermore, it has been posited that financial deepening may be determined by monetary and fiscal policies, interest rates and financial intermediation (Anyamaobi & Okey-Nwala, 2023). It is against this backdrop, that the study sought to examine the moderating effect of monetary policy rate on the relationship between financial deepening and capital market development in Nigeria. Specifically, the study aimed to:

- (i). assess the moderating effect monetary policy rate on the relationship between credit to private sector ratio and capital market development in Nigeria; and
- (ii). examined the moderating effect of monetary policy rate on the relationship between monetisation ratio and capital market development in Nigeria.

2. Literature Review

2.1 Conceptual Review

Capital market is a financial market where medium to long-term funds in the form of financial securities such as bonds, shares and derivatives, are traded (Babarinde, & Enoruwa, 2021). The market could be sub-divided into two: primary and secondary market where new securities are issued; and where existing securities are traded respectively. Capital market development has been popularly gauged using market capitalization ratio- the ratio of capital market capitalization to gross domestic product. This is an indication of the expansion of the capital market vis-à-vis the overall economy. Thus, the higher the capital market capitalization ratio, the more the development of the capital market.

Financial deepening refers to the expansion of the financial services in terms of depth-greater penetration of all strata of the society with varieties of financial services (Babarinde, & Enoruwa, 2021). In a foundational definition, financial deepening was explained to mean increase in the pool of financial services which are directed to all societal strata (Shaw & McKinnon, 1973). In other words, financial deepening refers to the capability of financial institutions to effectively mobilize savings for investment purposes (Anyamaobi & Okey-Nwala, 2023). Financial deepening also refers to both a wider choice of services and better access for different socioeconomic groups (Attah-Botchwey et al., 2022). Financial deepening has also been described as an aspect of financial development which involves the increase in financial assets relative to the size of the economy (Daneji & Babarinde, 2023).

Monetary policy has been defined as a deliberate action of the monetary authority to regulate the amount, cost and availability of credit and money in the economy (Babarinde & Gidigbi, 2021). In other words, monetary policy refers to the

combination of measures designed to regulate the value, supply and cost of money in an economy (Alugbuo & Chika, 2020). One of the key tools of monetary policy is the monetary policy rate. It is the rate at which the Central Bank of Nigeria extend credit facility to other financial institutions operating in the country (Echekoba et al., 2018). The monetary policy rate is used to influence the cost of credit in an economy.

Theoretical Review

Relating financial deepening to capital market without any form of government intervention could be purely a market dynamics issue, but when government, for instance, through monetary policy comes in to regulate the cost and available of credit, a form of financial repression is birthed. Therefore, financial repression theory emphasizes the role of government intervention in the financial system of a country through different policies and programmes in order to divert large amount of funds to the priority sectors and in line with the Keynesian school of thought, by controlling interest rates at reasonably low levels and by expanding the scope of government direct intervention, investment would greatly increase (Anyamaobi & Okey-Nwala, 2023).

Contra wise, when market forces of demand and supply are the main determinants of performance and operations of the financial market, then what has come to play is financial liberalization. Financial liberalisation is liberalising the financial sector to create a favourable environment to increase the money demand in the economy (Attah-Botchwey et al., 2022). The theory of financial liberalisation as pioneered by McKinnon (1973) and Shaw (1973) argues liberalizing the financial sector allows financial deepening and is an effective way to accelerate growth (Attah-Botchwey et al., 2022).

In another postulate, the theory of financial intermediation lays emphasis on the role of the financial sector, particularly, financial institutions in assisting net-borrowers to access funds from the net-savers by serving as an intermediary between the deficit economic units and surplus economic units through channelization of funds for productive purposes. Thus, by pooling and allocating funds, financial intermediation fosters entrepreneurship and innovation, necessary components for economic development (Attah-Botchwey et al., 2022).

Empirical Review

Nwakoby and Alajekwu (2016) examined the effect of monetary policies on stock market performance in Nigeria from 1986 – 2013 using Ordinary Least Squares (OLS) and Granger causality tests. The study found that monetary policy rate has

insignificant positive effect on All-Share Index (ASI) but ASI has no causality with monetary policy rate in Nigeria in the study period.

In another study, Wanja (2017) investigated the effect of financial deepening on capital market development in Kenya using Autoregressive Distributed Lag- Error Correction Model (ARDL-ECM). The study indicates that financial depth and market liquidity has positive significant effect on capital market development. However, financial deepening measured by financial access and openness was found to have negative but significant impact on development of capital market in Kenya.

Echekoba et al. (2018) assessed the linkage of monetary policy tools with the performance of the Nigerian capital market using ARDL technique. The study found that Nigerian capital market performance was not significantly affected by monetary policy rate announcement; rather, it is monetary policy rate that was significantly influenced by performance of the capital market.

Damina et al. (2019) examined the effect of monetary policy on the performance of the Nigerian stock exchange from 1991 to 2017 using multiple regression technique. The study concludes that monetary policy rate has negative and significant effect on stock market index in Nigeria.

Mba (2019) investigated the relationship between monetary policy statements and the stock prices in Nigeria before and after the monetary policy committee (MPC) meetings held in 2017 using paired samples statistical t-tests. The analysis showed that only the stock prices of banks, insurance and other financial institutions respond to the MPC communications. Furthermore, stock prices of most quoted firms increased immediately after the MPC meetings.

Apply vector auto-regression (VAR) and vector error correction model (VECM), Okeya and Dare (2020) assessed the link between stock market development and financial deepening indicators in Nigeria. The study concludes that financial deepening have significant positive effect on stock market development in the long run but negative insignificant effect in the short run.

Babarinde and Enoruwa (2021) examined the interdependence between financial deepening indicators and stock market returns and liquidity in Nigeria from 1985-2018 using two-stage least squares regression and pairwise Granger causality test. The study reveals that financial deepening indicators (money supply ratio and capital market capitalization ratio) have positive significant effects on stock market

liquidity while ratio of credit to private sector ratio had positive but non-significant effect on stock market liquidity in Nigeria. Furthermore, financial deepening (capital market capitalization ratio) exerts positive and significant effect on stock market returns in Nigeria.

Tiamiyu et al. (2022) investigated the link between financial deepening and the development of the stock market in Nigeria over the period of 1981 and 2019 using ARDL approach. In the long run, the drivers of stock market development in Nigeria were established to be financial development, domestic saving as a ratio of GDP, broad money diversification and GDP. Similarly, Attah-Botchwey et al. (2022) investigated the effect of financial deepening on stock market performance in selected Sub-Saharan Africa (SSA) from 2001 to 2019 using Seemingly Unrelated Regression (SUR) technique. The study found that financial deepening measured as broad money supply had positive and significant impact on stock market performance in the selected SSA.

Lenyie et al. (2023) evaluated the effect of financial deepening on capital market liquidity in Nigeria using OLS regression, granger causality test, and vector error correction model. The study found that financial deepening indicators (narrow money supply, broad money supply, credit to private sector, money outside the bank, and money market instrument) have significant effects on Nigeria's capital market liquidity. In a related study, Anyamaobi and Okey-Nwala (2023) examined the effect of financial deepening and capital market efficiency in Nigeria. The study concludes that there is no significant relationship between financial deepening and capital market efficiency in Nigeria in the study period.

Using ARDL technique, Daneji and Babarinde (2023) analyzed monetary policy rate and its effect on capital market deepening in Nigeria over the period, 1981-2021. The study found that monetary policy rate has negative and significant effect on capital market deepening in Nigeria both in the short and long-runs.

From the review of literature, it can be seen that financial deepening, depending on the indicators had different effects and the divergence in findings requires the introduction of a moderator, which in this study, is the opportunity cost of money, as it relates to monetary policy rate.

Methodology

The study in a bid to examine the moderating role of monetary policy rate on the relationship between financial deepening and capital market development in Nigeria, adopted ex-post facto research design. The design allows the establishment of causal and co-relational links between variables of interest.

The data used in the study are time series data obtained from secondary sources, that is Central Bank of Nigeria Statistical Bulletin. The variables and their measurements are presented in Table 1.

Table 1: Measurement of Variables

Variables	Abbreviation	Measurement
Capital market development t	MCAPR	Market capitalization ratio, as an indicator of capital market development, measured as the ratio of stock market capitalization to gross domestic product at time t (MCAPR) % Market capitalization of listed domestic companies (% of gross domestic product)
Financial deepening:	FDMNR	Monetisation ratio, as an indicator of financial deepening, defined as ratio of broad money supply(M2) to gross domestic product at time t (as a percent).
Financial deepening:	FDCPS	Credit to private sector ratio, as an indicator of financial deepening, defined as ratio of credit to private sector to gross domestic product (as a percent).
Monetary policy rate	MPR	Monetary policy rate. Monetary policy rate was called minimum rediscounting rate prior to 2006.
Interaction variable 1	CPSMNR	Interaction between monetary policy rate and credit to private sector ratio, as an indicator of financial deepening
Interaction variable 2	MNRMPR	Interaction between monetary policy rate and monetisation ratio, as an indicator of financial deepening.

In the study, the dependent variable is capital market development while the independent variables are the two financial deepening indicators-monetization ratio, and credit to private sector ratio. The two interaction variables are representations of the interaction of monetary policy rate with monetization ratio and credit to private sector ratio as measures of financial deepening.

The functional relationship among these variables are specified econometrically in equation (1).

$$MCAPR_t = \beta_0 + \beta_1 FDMNR_t + \beta_2 FDCPS_t + \beta_3 MPR_t + \beta_4 CPSMPR_t + \beta_5 MNRMPR_t + e_t \dots \dots \dots (1)$$

The model of the study was estimated using the Autoregressive Distributive Lag (ARDL) technique. The estimator was found suitable, in that it can estimate series of mixed orders of integration I(0) and I(1) as well as pure I(1) or I(0) series. The technique also produces both short-run and long-run estimates of the relationship between variables of interest.

Results and Discussion

4.1 Descriptive Statistics

Table 2 reports the descriptive statistics of the variables of the study.

Table 2: Descriptive Statistics

	MCAPR	CPS	MNR	MPR
Mean	12.07037	11.91185	15.89097	13.21512
Maximum	38.01393	22.75484	27.09274	26.00000
Minimum	3.085372	5.806165	8.464230	6.000000
Std. Dev.	9.096102	5.770229	5.661930	3.995005
Jarque-Bera	5.143199	5.982901	5.162316	4.940120
Probability	0.076413	0.050215	0.075686	0.084580

According to the descriptive statistics in Table 2, the average capital market capitalization ratio (MCAPR) in Nigeria between 1981 and 2023 stood as 12.07 percent and the ratio reported a minimum and maximum values of 3.08 per cent and 38.01 per cent respectively. The ratio (MCAPR) was relatively stable around its value (given that its mean exceeds its standard deviation) and also attained normality at the 0.05 level. The mean values for credit to private sector ratio to gross domestic product (CPS) and money supply as a ratio to gross domestic product (MNR) was 11.91% and 15.89% respectively. Both indicators of financial deepening (MNR and CPS) were not volatile around their averages and they were also normally distributed. The monetary policy rate reported an average value of 13.21 and the series ranges between a minimum and a maximum of 6.00 per cent and 26.00 per cent respectively. Like other variables of the study, monetary policy rate was normally distributed and relatively stable around its mean in the study period.

Unit Root Tests

Table 3 contains the result of the Augmented Dickey-Fuller (ADF) unit root test.

Table 3: Augmented Dickey-Fuller Unit Root Test

	ADF Test in Level		ADF Test at First Difference	
Variables	Coefficient	Probability	Coefficient	Probability
MCAPR	-1.098659	0.7076	-7.100037	0.0000
CPS	-0.703057	0.8350	-5.866151	0.0000
MNR	-0.304090	0.9156	-5.706805	0.0000
MPR	-3.260569	0.0233		

According to the ADF statistics in Table 2, the unit root hypothesis cannot be rejected in the level form of capital market capitalisation ratio (MCAPR), credit to private sector ratio to gross domestic product (CPS) and money supply as a ratio to gross domestic product (MNR) but until after first difference. This implies that the trio (MCAPR, CPS and MNR) became stationary at first difference. However, monetary policy rate (MPR) attained stationarity in level due to the fact that the null hypothesis of unit root could be rejected at the level of the variable.

Cointegration Test

Table 4 reports the result of the F-Bounds test of cointegration.

Table 4: F-Bounds Test of Cointegration

		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	5.298467	10%	2.08	3
K	5	5%	2.39	3.38
		1%	3.06	4.15

F-Bounds test reported in Table 4 indicates the rejection of the null hypothesis of no levels relationship among the variables of the study and it can be concluded therefrom that there was a long-run relationship between financial deepening and capital market development in Nigeria.

Model Estimation

Table 5 contains the result of the Autoregressive Distributed Lag (ARDL) model of the moderating effect of monetary policy rate on the financial deepening-capital market development nexus in Nigeria.

Table 5: Autoregressive Distributed Lag Model of the Moderating Effect of Monetary Policy Rate on the Financial Deepening-Capital Market Development Nexus in Nigeria

[I]. Model Estimation Results					
Long-Run Estimates			Short-Run and Error Correction Estimates		
Dependent Variable: MCAPR			Dependent Variable: MCAPR		
Variable	Coefficient	Prob.	Variable	Coefficient	Prob.
MCAPR(-1)	0.4914	0.0122	MCAPR(-1)	-1.7975	0.0000
MCAPR(-2)	0.5885	0.0546	MCAPR(-2)	-1.2090	0.0000
MCAPR(-3)	1.2090	0.0050	CPS	-3.7573	0.0055
CPS	-3.7573	0.0073	MNR	3.8526	0.0021
CPS(-1)	-5.9429	0.0318	CPSMPR	0.1659	0.0692
MNR	3.8526	0.0273	MNRMPR	-0.2070	0.0085
MNR(-1)	3.7205	0.0533	ECT	1.2890	0.0000

CPSMPR	0.1659	0.0120	R-squared	0.6158	
CPSMPR(-1)	0.3019	0.0567	Adj. R-squared	0.5460	
MNRMPR	-0.2070	0.0383	Durbin-Watson	2.1149	
MNRMPR(-1)	-0.2209	0.0700			
MPR	1.2467	0.1851			
Constant	-16.9688	0.1543			
R-squared	0.8925				
Adj. R-squared	0.8448				
F-statistic	18.6908	0.0000			
Durbin-Watson	2.1149				
[II]. Other Diagnostic Tests					
Tests	Type	Stat.	Prob.	Remarks	
	Ho: No Serial Correlation				
Breusch-Godfrey Serial	F-statistic	0.1340	0.8752	Accept Ho	
Correlation LM	Obs R-squared	0.4244	0.8088	Accept Ho	
ARCH Heteroscedasticity	Ho: No Heteroskedasticity				
	F-statistic	0.6159	0.4375	Accept Ho	
	Obs R-squared	0.6386	0.4242	Accept Ho	

The diagnostic tests of the ARDL regression in summary (in Panel II of Table 5), indicate no serial correlation, and heteroscedasticity problems in the ARDL models estimated. Also, the stability test (in Fig.1), reveals the stability of the coefficients of the ARDL model estimated. In the same vein, the coefficient of determination (R-squared) shows that about 89% of the variation in capital market development was explained by financial deepening and other explanatory variables in the model. The F-statistics of the ARDL model was found to be statistically significant. This suggests the joint significance of the variables in the ARDL model.

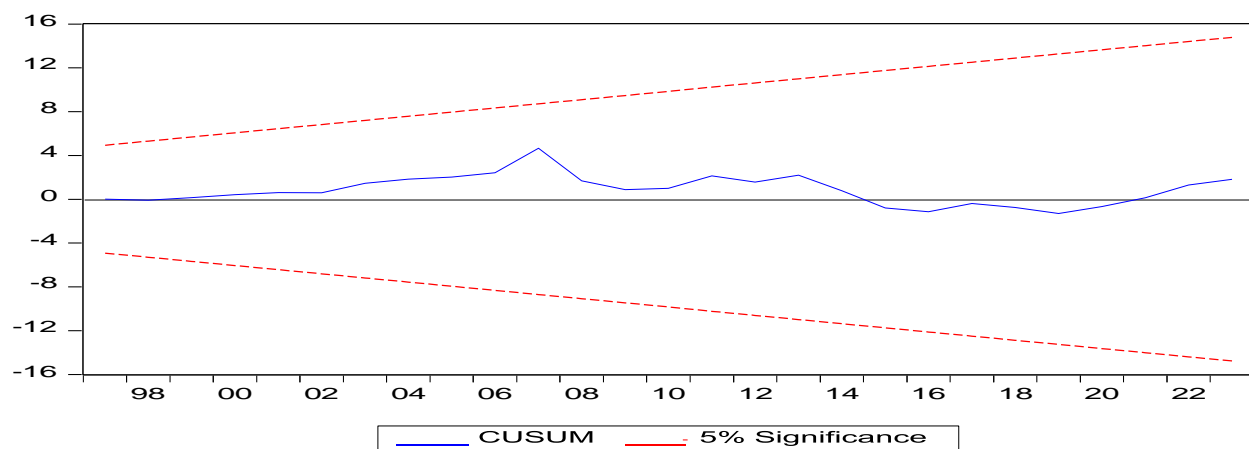


Fig. 1: CUSUM Stability Test

Having established the robustness of the ARDL model based on the results of the diagnostic tests, the results of the study could be used relied upon for policy suggestion.

Therefore, according to the estimates of the model (in Panel I of Table 5), the study found that monetary policy rate reduces the negative effect of credit to private sector/gross domestic product ratio on market capitalization ratio both in both short- and long-runs in Nigeria.

However, when examined using the monetization ratio, monetary policy rate hampers the positive effect of financial deepening on market capitalisation ratio in Nigeria in both long- and short-run.

Conclusion and Recommendations

This study investigated whether monetary policy rate enhances or reduces the effect of financial deepening on capital market development in Nigeria from 1981 to 2023 using Autoregressive Distributed Lag (ARDL) technique. The study found that monetary policy rate reduces the negative effect of credit to private sector/gross domestic product ratio on market capitalization ratio both in both short- and long-runs in Nigeria. However, when examined using the monetization ratio, monetary policy rate hampers the positive effect of financial deepening on market capitalisation ratio in Nigeria in both long- and short-run.

The study therefore concludes that monetary policy rate significantly moderates the financial deepening-capital market development nexus in Nigeria. Therefore, there is the need for the Central Bank of Nigeria to use the tool of monetary policy rate with caution by taking cognizance of its significant role in the economics of capital market development in Nigeria.

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