Impact of financial deepening on domestic investment in Nigeria

Abstract
This study investigated the impact of financial deepening on domestic investment in Nigeria. The time scope of the study covered the period 2005-2022. The response variable was domestic investment (DI) while the treatment variables were financial deepening indicators (broad money supply, private sector credits, and stock market capitalization. The specific objectives were to investigate the impact of credits to private sector on domestic investment in Nigeria; determine the impact of broad money supply on domestic investment in Nigeria; examine the impact of stock market capitalization on domestic investment in Nigeria; and ascertain the impact of monetary policy interest rate on domestic investment in Nigeria. The study adopted ex post facto research and employed the ARDL technique to analyze the data.Diagnostics and stability tests were applied (unit root, CUSUM and CUSUM of squares). the findings of the study indicated the series to be stationary but of mixed order 1(0) and 1(1); while the cointegration test showed evidence of long-run relationship. The long-run coefficients (of the ARDL) estimation indicated broad money supply has significant positive impact on domestic investment; private sector credit has significant positive impact on domestic investment; and the stock market capitalization has significant positive impact on domestic investment. However, the interest rate indicated to be negative on domestic investment. The policy implication of these findings impinges on government and authorities in the financial sector to develop a roadmap to further deepen the financial space to drive growth in domestic investment. Based on the findings, the study recommended that the financial authorities should strategize to satisfy the demand for business investment funds by expanding the broad money supply and the private sector credits. Also, the monetary policy interest rate should be reviewed down in order to reverse its negative effect on investments.

Keywords: Financial deepening, domestic investment, autoregressive distributed lag.

1. *Introduction*

The achievement of macroeconomic goals drives government into strategic actions and mechanisms involving the adoption of financial intermediation tools. Hence, financial deepening policies are employed by government in the process of influencing economic performance including domestic investment. Factsin finance and economic literature holdthat financial intermediation strategies such asfinancial deepening operations by government through the monetary authorities is required to correct, guide and supplement the market forces in creating conducive economic environment for domestic investments to thrive (Sebastian &Kingsley, 2020). Hence, it is hard, if not impossible for significant growth to erupt in an economy wheredomestic investments are evidently grossly inadequate. This view is supported by Falade and Olagbaju (2021).

The sustained increase in supply and flow of, and greater access to financial intermediary services is the simplest understanding of the concept of financial deepening.For Sackey and Nkurumah(2020), their view of financial deepening forecloses a process signified by improvements in three key areas of financial intermediary services such as quantity, quality, and efficiency which are imperative for economic performance indicated by the size of domestic investments and aggregate economic growth. Hence, Ndebbio (2021) has observed that economic growth factoredthrough domestic investment will consequently dependhow much the financial system is deepened. As a result, financial deepening poses as one of the triggers that could be pulledto quicken the pace of the financial market; and enhance its contributions in the economy since it encompasses financial intermediary services which co-function with domestic investment.Financial deepening is multi-faceted and x-rays thecausal and working interaction of a number of marketindicators and stakeholders like banks, savings institutions and firms; and in addition, it explains how the monetary policy and the financial institutions facilitate production, distribution, exchange, payment services, mobilize and pool savings for large number of investors, acquire and process information about firms and the potential for investment projects.

For strands of literature on the systemic working relationship between financial deepening indicators such as money supply and domestic investment performance, we can look to Levine (2005), Colombo and Paccagnini(2020), and Calatno (2023). The view holds that an increase in the volume of money supply interacts and lowers the interest rates; the lower rates prompts increased demand for credit for spending and consumption demand; the expansions in consumption demand triggers additional investments, this is the typical business cycle through which financial deepening and domestic investment interact. To further understand this interaction; businesses are observed to respond to the lower rates and increased credit demands by ordering additional productive resources (raw materials) and labour.The reverse occursassuming the rates were tilted up; the credit demand will fall as well as investment demand. Since the banks willconsequently offer less in lending, businesses will respond by putting off new projects, hence a decline in domestic investments.

The supply of credits to the to the private sector is pivotal for investment and productive activities in the domestic economy; through it, disruptive growth is achieved as small scale enterprises in almost all sectors of the economy spring up to fill the gap created by increase in

consumption and investment demand. In the same vein the value of theannual capitalization in the stock market hold a lot of implications for individual businesses. According to Catalano (2023) the stock market affects individual businesses in an economy in many different ways such as consumer spending and business operations. Typically, the stock market and economic performance are aligned. Thus, when the stock market is performing well, it is usually a function of a growing economy. Hence, there is an inherent relationship between the financial deepening variables (money supply, private sector credit and stock market capitalization) and domestic investment

Concerns about domestic investment are hinged on the need to provide jobs and employment opportunities for the teeming labor force besides ensuring the availability of a wide variety of economic and consumer goods. This has led to expansions in policies that seek to drive up domestic investment. The government stimulates and helps domestic investment by providing growth and performance incentives for local manufacturers and other businesses classified as real sector activities. On one hand the domestic economic activities focus on efforts in the direction of investments (establishment of more firms, development of raw materials base, market expansions, as well as human resource development); in supporting the domestic investors, the government uses monetary policies couched as financial deepening indicators which are drivers of growth in domestic investment.

Systemic overhaul has been effect in the financial space of Nigeria during which financial deepening indicators received policy boost from the monetary policy authorities within the last three decades with special mention of the 2004 banking sector recapitalization exercise and the 2009 financial sector reforms. Within that period, the economy was characterized by what Otieno (2022) described as lack of liberalization (extensive regulation), insufficient credit extension programmes, weak banking structure accompanied by defective risk management systems among other factors. The major thrust of these reform policies was primarily financial liberalization intended to open up the financial space and improve financial deepening for domestic investment. Thus more emphasis directed at ensuring a deepened financial sector is imperative in order to support domestic investment.

1.2 Statement of the problem

Generating sufficient volumes of domestic investments needed to support sustainable economic growthhas proved to be problematic for Nigeria, as many investors have had to move their investment activities to other countries with better investment environment (Sebastian & Kingsley, 2019). This is an indication that the various economic reforms undertaken to deepen the financial space have not yielded the desired result.

Insufficient credit mobilization for private sector investment has persisted; and complicated more by poor private credit/domestic investment ratio. The ratio of domestic credit/private sector gross domestic product was 12.1 percent in 2020, a far cry from the 50 percent global benchmark (Ozili, Oladikpo & Iorhember, 2023). This is attributed to the excruciatingly high cost of doing business that translates to high market interest rate at 25 per cent in 2021 coupled with the unwillingness of formal lenders to lend to high-risk businesses. In addition, the central bankadopted on-lending to various sectors of the economy through financial institutions;this crowd out private sector lending and further worsens the share of domestic credit to the private sector relative to GDP and down the channel domestic investment is negatively impacted.

The financial deepening – investment nexus has formed hot debate topics and erupted empirical interests over the past few decades.This debate has characteristically been two-foldcomprising the supply-leading hypothesis (Neusser& Kugler, 1998) on one side and the demand- leading hypothesis (Patrick, 1966) on the other side. The major thrust of the supply leading hypothesis projected investment as the resultant effect of pulling the triggers on financial deepening, and further contended that the deepening of financial system can create and expand liquidity, mobilize savings and promote rapid expansions in private sector investments. However, empirical evidence seems to be divergent on the impact of financial deepening on investment.

In terms of the methods adopted, previous studies reviewed employed single equation framework which is inadequate in the analysis of long-term inter-relationships, thus making it difficult to capture the composite effect of financial intermediation on the economic units (investment sector). Following this gap, the present study examined the impact of financial deepening on the domestic investment in the Nigeria economy. The broad objective of this study is to empirically investigate the impact of financial deepening on domestic investment in Nigeria, specifically the study sought to:

1. To investigate the impact of credits to private sector on domestic investment in Nigeria.
2. To determine the impact of broad money supply on domestic investment in Nigeria
3. To examine the impact of stock market capitalization on domestic investment in Nigeria
4. To ascertain the impact of monetary policy interest rate on domestic investment in Nigeria.

2. Related Literature

The figure below is the conceptual framework that will guide this study

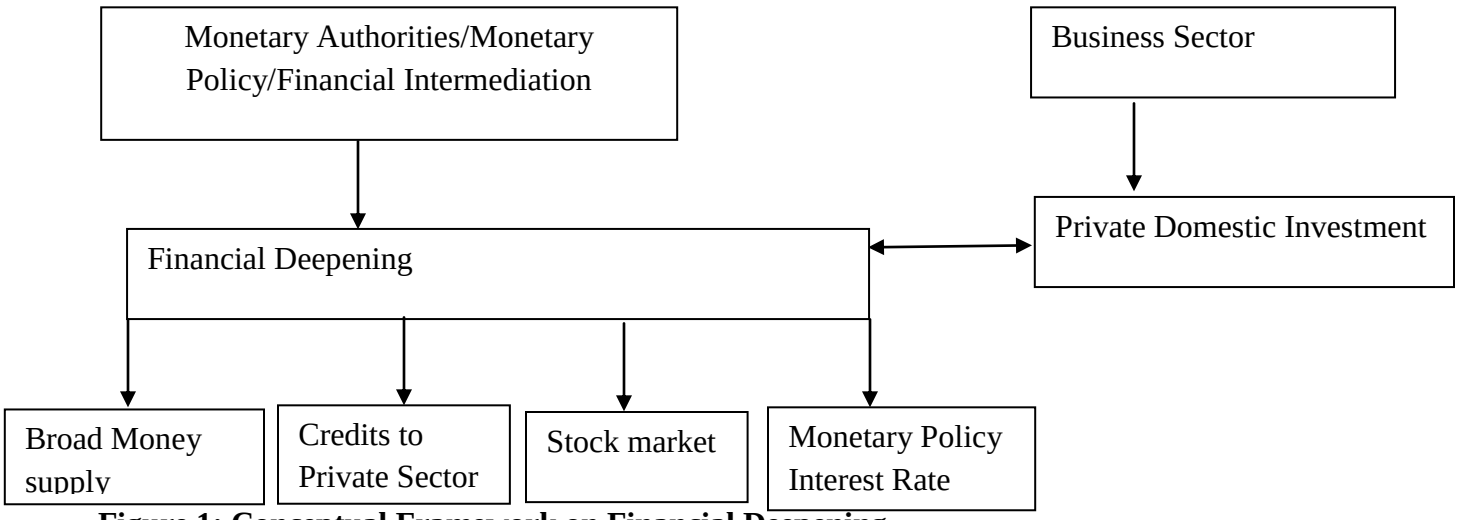

Figure 1: Conceptual Framework on Financial Deepening

The figure 1 above describes the relationship between the monetary authorities/financial institutions and the business sector. It further shows the channel through which financial deepening impacts domestic investment. The monetary authorities create policies (using money supply and the interest rate) that enable the financial institutions to create credits for business investments within the economy. The monetary policy also works to enhance the functioning and performance of the stock market to connect the savings sector with the investment sector. It is from this working relationship that financial deepening is derived.

Financial Deepening

The World Bank (2018) defined financial deepening in terms of increases in the stock of assets. For Shaw (1973), it is the specialization in financial functions and institutions through which organized domestic institutions and markets relate to foreign markets. Hence, it can be stated that

financial deepening is the depth to which financial sector has penetrated the economy such that it leads to increase in aggregate economic output of a country. The variables which explain a deepened financial system include broad money supply, private sector credits, stock market development (in terms of size of capitalization) and monetary policy (through the interest rate).

As argued by Otieno (2022), a deepened financial space broadens access to funds, whereas for most developing countries (Nigeria for example), access to credit is limited and investment decisionsare constrained. This results in retardation of domestic investment and economic performance. The components of financial deepening according to CBN (2022) are the ratio of private sector credit to the gross domestic product, the ratio of money supply to the gross domestic product, and the annual value of stock market capitalization. Hence, in determining the financial deepening statistics these ratios are computed using the broad money supply and the credit to private sector as critical deepening variables.

Broad Money Supply, Private Sector Credits and Stock Market Capitalization

Money Supply (broad) could be described as the depth of the financial market compared to the overall economy. Money supply is portrayed from two perspectives(narrow money and broad money). Broad money (M2) measures the total volume of money supply in the economy comprisingnarrow money (M1) and savings and time deposits with the banks. When CBN changes the level of money supply, it does so through the control of the base money. In essence, the CBN regulates money supply based on the knowledge that there is a stable relationship between the quantity of money supply and economic activity.

Private sector credit (the extent to which financial services are provided to the private sector) is an important component of the financial deepening measurement. It is credit issued by financial institutions to the non-financial private sector as a share of GDP (Rahman & Mustafa 2015). Stock market capitalization refers tothe value of listed shares divided by GDP. The assumption behind this measure is that overall market size is positively correlated with the ability to mobilize capital and diversify risk on an economy-wide basis.The Nigerian economy has on-going growth of development vis-a-vis the Nigerian Stock Market, which came to its peak at the period of recapitalization of the banking industry in 2004 (Soludo's Central Bank of Nigerian (CBN) led administration).

2.2 Theoretical Framework

The Feedback Theory propagated by Schumpeter in 1912 formed the theoretical framework for this study**.** The theory suggested a two-way causal relationship between financial development and economic performance. It is further asserted that that an economy where the financial system is developed could reap high economic expansion frominvestments, technological changes, product and services innovation (Schumpeter, 1912). The outcome of such a deepened financial system is high demand on the financial arrangements (financial credits) and services which are channeled towards the investment sector for additional value creation in products and services (Levine, 1997). The basic assumptions are that:

1. Banks effectively respond to demands by providing necessary financial services and products which stimulate growth in demand
2. The financial intermediation (through credit creation) is channeled towards the productive sectors of the economic (Business investments)
3. The presence of a functioning capital market
4. The growth in demandwill stimulate a higher economic performance.

Therefore, both financial development and domestic investments are positively interdependent and their relationship could lead to feedback causality. This view is supported strongly by the work of Luintel and Khan (1999), among others.

This theory is relevant to the present study as its application will aid the empirical evidence of the relationship between financial system development (financial deepening) and domestic investment. The theory will particularly provide a guide to the model for determining the impact of financial deepening on domestic investment and help in testing the hypothesis. With this theory also, the researcher will be able to determine the magnitude and sign direction of the impact of the model variables.

2.3 Empirical Review

Empirical evidences on the financial deepening – domestic investment nexus has been quite scanty, although component analysis empirical observations have been attempted. For example

Ezeoha, Ogamba and Onyiuke (2022) studied the relationship between stock market development and investment flows.They intended to answer the question of whether the stock market plays distinct role in attracting both domestic and foreign investments. They adopted extrapolated macroeconomic quarterly data (over a period from 1980 to 2021). The summary of their major findings using the vector error correction model (VERCM) showed that the stock market spur growth in domestic private investment flows, but unable to do so in the case of foreign private investment. However, the study also observed thatthe banking system rather had some destabilizing effect on the flow of private investments. The researchers attributed this to persistent cases of distress and failure in the banking system. Other empirical studies on the financial deepening - investment nexus include Akpan (2022), Madubuike, Metu and Kalu (2021). Also Sani (2021) examined the financial deepeningin relation to investment. Adopting the *ex post facto*research and employing the ordinary least squares (OLS), the summary of their findings indicatedmoney supply and private sector credit asinsignificant determinants of investment growth while interest rate was positive on investment. This result may be assessed to differ from theoretical expectation of inverse relationship between interest rate and investment. The findings may have emerged due to the analytical method applied (OLS), to enhance the reliability of findings it is imperative to apply advanced econometric methods such as the vector error correction to studies with macroeconomic outlook such as financial deepening and investment.

The justification for this study is based on the gaps identified in the various literatures reviewed. The gaps are grouped as follows. The various literature reviewed suggest that studies on the subject of financial deepening and domestic investment is relatively scanty. Most studies on this subject focused on the relationship between money supply and economic growth, but this study is rather interested in the relationship and effect of financial deepening measures (private sector credits, stock market capitalization, and themoney supply); and domestic investment.Domestically, to the knowledge of the researcher, prior studies conceptualizing financial deepening and its relationship with domestic investment in Nigeria is evidently scanty. Studying financial deepening for Nigeria is imperative owing to the growing demand for business investment funds. Hence this study focuses on investigating whether financial deepening indicators (credits to private sector, volume of money supply, stock market

capitalization and the monetary policy interest rate) could impact significantly explain the performance of domestic investment.

In all of the empirical studies reviewed, none of the studies included comprehensively modeled financial deepening variables with domestic investment (the models were rather selective, modeling the variables separately in separate studies), hence it cannot yet be satisfactorily proved whether financial deepening influence domestic investments with the determinant variables in isolation of each other or in joint interaction. This is one of the justifications for this study. Again, the financial intermediation follows the prevalent monetary policy rate; hence any study on financial deepening must necessarily include the monetary policy interest rate as an explanatory variable. However, none of the empirical models as reviewed included the monetary policy interest rate as either key or control variables in joint interaction model. This study closes this gap by incorporating stock market capitalization, monetary policy interest rate, money supply and credits to private sector as regressors.

3. Data, Model and Analytical Technique

The data used in the analysis were sourced from the CBN statistical bulletin (2022), the NBS, Federal Inland Revenue Service (FIRS) annual reports for various years, Nigeria Extractive Industry Transparency Initiative (NEITI) annual reports. The unit measurements of the variables are as follows:

Table 1: Unit measurement of model variables

Variable	**Unit of Measurement**	**Sources of Data**
Domestic Investment (DInv)	Annual value of private sector investment spending, measured in naira (₦)	CBN Statistical Bulletin National Bureau of Statistics (NBS), NGX.
Credits to Private Sector (CPS)	Total annual value of credits and advances to the private sector; measured in (₦)	CBN Statistical bulletin and annual reports for various years,
Broad Money Supply (BMS)	Total annual value of money circulating within the economy; measured in (₦)	CBN Statistical bulletin and annual reports for various years, .
Stock Market Capitalization (SMC)	Total monetary value of annual capitalization of the stock market measured in naira (₦)	CBN Statistical Bulletin National Bureau of Statistics (NBS), Stock Exchange Group

Source: Researchers' Compilation 2023

Model Specification

The empirical model for this study specified domestic investment as a function of financial deepening(using the variables broad money supply, credit advances to private sector, stock market capitalization, and monetary policy interest rate).

Functionally, the model is specified below:

DInv = (CPS, BMS, SMC, INTR) … Eq. 1

Where:DInv = domestic investment; CPS = private sector credits; BMS = volume of money supply; SMC = stock market capitalization; and INTR = interest rate

The linearized (econometric) model is specified thus

$DInv_t = \beta0 + \beta1CPS_t + \beta2BMS_t + \beta3SMC_t + \beta3INTR_t + Ut$ … Eq. 2

The analytical method adopted for this study is the vector error correction model (VECM). Hence, the error correction differenced equation transformation of the model is:

$$\mathbf{\Delta DInv_t = \alpha_0 + \alpha CPSt_{-1} + \alpha_2 BMSt_{-1} + \alpha_3 SMCt_{-1} + \alpha_3 INTRt_{-1} \sum \alpha \Delta y_t + \mu_1 + e_t} \ \ldots \text{ Eq 3}$$

Y= time series, **t**= linear trend, **Δ**= the first difference operator, $\mathbf{\alpha_0}$= constant, **n**= optimum number of lags in the dependent variable and **e**= error term. The apriori expectations of the model based on the feedback theory is that $\beta1 - \beta3 > 0$, while $\beta4 < 0$.

4.0 Results

4.1 Unit Root Diagnostic Test

The researchers first took the natural log of the variables with large values (domestic investment, stock market capitalization, broad money supply and private sector credits). Stability of model series is imperative for reliable application to forecasting, decision making and policy. The study performed the unit root diagnostic test to check for stationarity and stability of the model variables. This was done using the Augmented Dickey Fuller approach to unit root. The test was

applied on the series at levels under deterministic and trend specification. The table 1 below is a summary of the series tests.

Table 2: Summary result of unit root test

ADF Test @ level				ADF Test @ 1st difference		
Series	ADF-statistic	p-value	order	ADF-statistic	p-value	order
LOGBMS	-4.572949	0.0004	1(0)	-	-	-
LOGPSC	-5.61123283	0.0000	1(0)	-	-	-
LOGSMC	-4.809504	0.0079	-	-	-	-
INTR	-2.264861	0.3819	-	-4.348973	0.0174	1(1)
DI	-2.179263	0.4700	-	-4.926964	0.0064	1(1)

Source: Authors' computation 2023 (Using E-views)

As indicated, the results show that the broad money supply (LOGBMS), the stock market capitalization (LOGSMC) and the private sector credit (LOGPSC) variables were stationary at level, hence, the order of integration was 1(0) and differencing was not applied. However, the interest rate (INTR) and the domestic investment (LOGDI) variables were not stationary at level. Differencing was applied at first order and the series became stationary 1(1) order of integration. The stationarity was concluded using the p-value of the ADF test statistics. Summarily, there model varaiables showed mixed integration of order 1(0) and 1(1).

4.2 Descriptive Statistics

Model series possess basic statistical features which help in preliminary and foundational understanding of their effects in policy application. The study therefore found it necessary to preview the descriptive properties of the series in order to improve reliability of the findings of the study. The researcher conducted the descriptive test (table 2) showing some selected measures of central tendency and dispersion in the model variables. Measures of central tendency help to view the points of convergence of the variables and their points of divergence. The major statistics of importance are the mean, the standard deviation, skewness, and kurtosis.

Table 2: Descriptive Test Result

	LOGDI	**LOGBMS**	**LOGPSC**	**LOGSMC**	**INTR**
Mean	15.92937	2.954716	2.753041	9.448133	11.44444
Std. Dev.	0.725629	0.265750	0.359125	0.801000	1.401831
Skewness	0.419147	-0.999911	-1.261721	-0.715891	-1.065767
Kurtosis	1.983060	2.372647	2.973239	3.016013	3.377549
Observations	18	18	18	18	18

Source: Authors' computation 2023 (Using E-views)

From the result of the descriptive test above, the domestic investment series (LOGDI) averaged 15.9237 trillion naira annually. The broad money supply (LOGBMS) averaged 2.96 trillion naira while the annual average values were 2.75 trillion naira for private sector credits (LOGPSC), 9.44 trillion naira for stock market capitalization (LOGSMC) and 11.44% for the monetary policy interest rate (IMTR). To standard deviation checked the spread or deviations of the series from the average value.A higher standard deviation value indicates greater spread in the data and negates joint influence. The safe value tends towards zero so that the closer the deviation is to zero, the better the result. As indicated in the result, the values tended towards zero, the closer the values are to zero, the better it is to accept that the series are from a normal distribution. Also, skewness defines the extent to which a distribution differs from a normal distribution, when data are skewed, the majority of the data are located on the high or low side of the graph. The descriptive result above shows that all the data have a normal distribution.The statistical result equally indicated that all the variables have a positive kurtosis.

4.3 Correlation Test

Correlation indication between financial deepening and domestic investment could offer some business decision insight for the macroeconomic management. To further enhance the reliability of the results of this studythe correlation test was used to ascertain the strength and magnitude of the relationship between the treatment and the response variables. The result of the correlation test is presented in table 3.

Table 3: Correlation Test Result

	LOGDI	**LOGBMS**	**LOGPSC**	**LOGSMC**	**INTR**
LOGDI	1.000000				
LOGBMS	0.681799	1.000000			
LOGPSC	0.473903	0.852704	1.000000		
LOGSMC	0.878489	0.739065	0.714718	1.000000	
INTR	-0.535099	0.774281	0.516246	0.416401	1.000000

Source: Authors' computation 2023 (Using E-views)

The correlation test result in table 3 above shows the correlation between financial deepening indicators and domestic investment. The relationship appearedpositive for all the series except for the interest rate.

4.4 Test of Long-run Relationship

Long-run relationship bears significant implications for economy-wide macroeconomic indicators such as the financial deepening variables. The policy application of macroeconomic indicators are longterm and forward looking, hence it is required that modeling for macroeconomic outlook must envisage long-run effects of treatment series and the response series. The study performed the cointegartion test of long-run relationship using the bounds approach. This approach was consequent upon the mixed integration of the series at order 1(0) and 1(1). Table 3 below is the cointegration test result.

Table 4: Bounds test of longrun relationship

ARDL Bounds Test
Date: 12/29/23 Time: 10:21
Sample: 2005 2022
Included observations: 17
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	6.069912	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound

10%	2.45	3.52
5%	2.86	4.01

Source: Authors' computation (Using E-views)

The decision rule was based on comparison between the lower and upper bounds of the computed F-statistic. Where the f- stat falls below the lower bound, the variables are concluded to be integrated of order I(0), which by definition imply no possibility of cointegration. However, where the f-stat exceeds the upper bound, cointegration is implied. But where the f-stat falls between the bounds, the test considered inconclusive. The F-statistic value 6.069912 is evidently greater than the I(1) (1) critical value bound. This therefore indicates that we should reject the t-Bounds test null hypothesis, and conclude the presence of long-run cointegrating relationship.

4.5Lag Selection Criteria

To evaluate the fitness of the model to the data it was generated from the study applied the Akaike information criterion (AIC). The different possible models were compared and the one which is the best fit for the data was determined. The result lag order selection result is presented below:

Table 5: lag selection criteria AIC result

VAR Lag Order Selection Criteria
Endogenous variables: LOGDI LOGBMS LOGPSC LOGSMC INTR
Exogenous variables: C
Date: 12/29/23 Time: 12:32
Sample: 2005 2022
Included observations: 17

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-29.67397	NA	4.07e-05	4.079291	4.324354	4.103651
1	43.34477	94.49484*	1.68e-07*	-1.569973*	-0.099596*	-1.423814*

Source: Authors' computation (Using E-views)

The best-fit model according to AIC is the one that explains the greatest amount of variation using the fewest possible independent variables. The rule of thumb is to adopt the lag length

where the AIC has the lowest value. From the result presented on table 5, the lag order with the lowest AIC value is order 1. Hence the study adopted 1 lag length.

4.6 ARDL Long-run Coefficient

The study extracted the estimated coefficients of the series using the long run estimates of the autoregressive distributed lag regression technique. Table 4 below is the ARDL long-run coefficients of the model variables.

Table 6: ARDL short run and long-run coefficients

ARDL Cointegrating And Long Run Form
Dependent Variable: LOGDI
Selected Model: ARDL(1, 1, 1, 1, 1)
Date: 12/29/23 Time: 10:22
Sample: 2005 2022
Included observations: 17

shortrun estimates				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGBMS)	0.438048	0.556786	0.786744	0.4481
D(LOGPSC)	-0.750653	0.271929	-2.760478	0.0185
D(LOGSMC)	0.348800	0.172604	2.020805	0.0683
D(INTR)	0.049972	0.031676	1.577622	0.1430
CointEq(-1)	-0.335146	0.146283	-2.291081	0.0427
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGBMS	1.307036	0.092603	2.729128	0.0012
LOGPSC	2.239779	0.162527	2.926647	0.0002
LOGSMC	1.040740	0.279714	3.720731	0.0034
INTR	0.149106	0.103472	1.441018	0.1774

Source: Authors' computation (using E-views)

Table 6 is the abridged autoregressive distributed lag (ARDL) result showing the short run and the long run estimates. As indicated, the short-run estimates were positive for broad money supply, stock market capitalization and the interest rate, but negative for the private sector credits

but the coefficients were not significant. However, the long-run coefficients showed that the coefficients were all positive and significant as indicated by the p-values. The only exception was the interest rate which appeared negative but not significant.Further, the result showed the adjusted coefficient of determination (R^2) of 0.920569, an indication that over 92% of variations in the domestic investment is explainable by variations in the financial deepening indicators (broad money supply, private sector credit, stock market capitalization and the interest rate). The f-stat value [38.08634, p-value 0.0000] further indicated the overall regression to be statistically significant, and confirmed joint influence of the treatment tools (BMS, SMC, PSC, and INTR) on the response variable (domestic investment).

4.7 Test of Model Stability and Reliability

A stable system (model) is robust to external changes and has a lot of implication for policy application of a model. To further ensure reliability of the results the study conducted the cumulative sum (CUSUM) and the cumulative sum of squares ($CUSUM^2$) tests for model stability and reliability. The results are presented below:

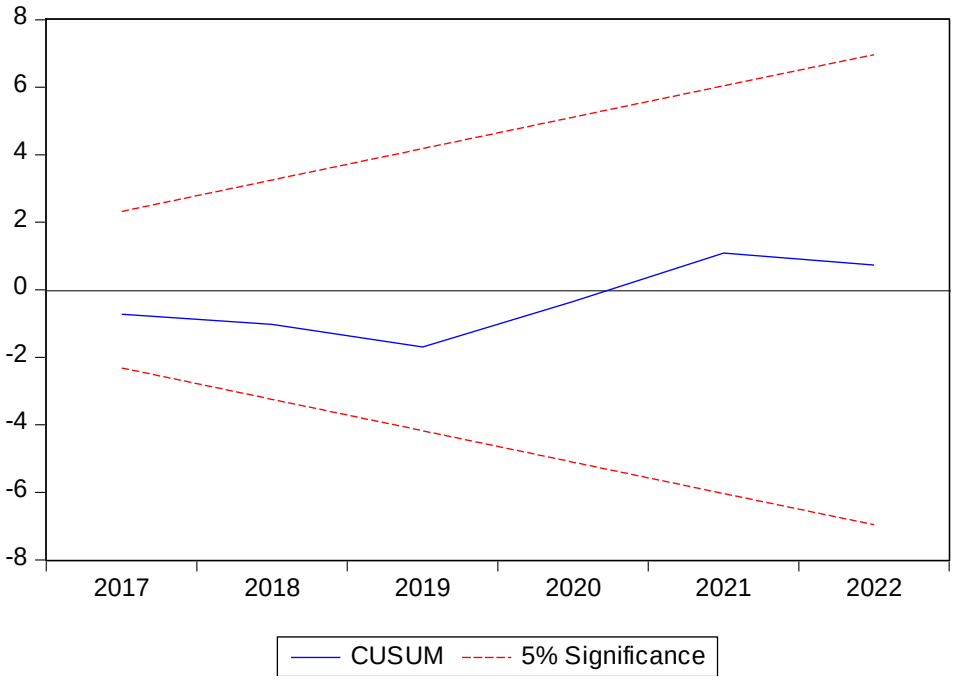

Figure 1: CUSUM test result

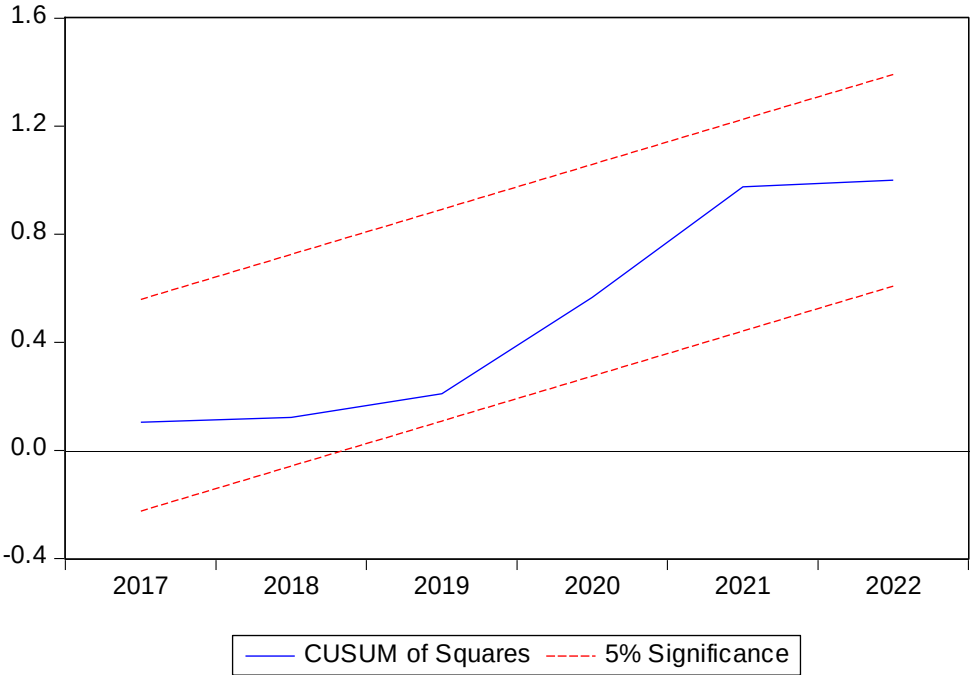

Figure 1: CUSUM of Squares test result

In testing for model stability and reliability using the CUSUM approach, the decision ule for stability is that the trend line should fluctuate around the zero line. If the CUSUM of squares approach is adopted, the rule of thumb is to check the trend line against the control limits (the 5% significance lines. The model is stable if the trend lies in-between the control limitsand considered unstable where the trend line cuts the control limits from above or below or falls outside the 5% significance line. From the results (figures 1 & 2), the CUSUM test showed the trend line to fluctuate around the zero line, and the CUSUM of squares also showed the trend line to lie within the control limits. Hence the model is relatively stable.

4.8 Causality Test

A variable is determined to "Granger cause" another variable where the available information on the causal variable improves ability to predict the behavior of the other variable. The VECM Granger causality test result presented on table 8 below showed mixed causality among the variables.

Table 8: Granger Causality Test Result

Pairwise Granger Causality Tests
Date: 12/29/23 Time: 10:43
Sample: 2005 2022
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LOGBMS does not Granger Cause LOGDI	16	3.10524	0.0053
LOGDI does not Granger Cause LOGBMS		3.42435	0.0698
LOGPSC does not Granger Cause LOGDI	16	13.9556	0.0010
LOGDI does not Granger Cause LOGPSC		0.80957	0.4699
LOGSMC does not Granger Cause LOGDI	16	1.84499	0.2037
LOGDI does not Granger Cause LOGSMC		7.65508	0.0083
INTR does not Granger Cause LOGDI	16	2.22167	0.1547
LOGDI does not Granger Cause INTR		2.47574	0.1295

Source: Authors' computation (using E-views)

Our interest in the causality test is between the treatment variables (broad money supply, private sector credits, stock market capitalization and interest rate) and the response variable (domestic investment). Between broad money supply and domestic investment, the result showed one-way causation running from money supply to the domestic investment, this imply that while money supply proved to granger cause domestic investment, it was not the case in the reverse situation. For private sector credit – domestic investment, the causality was also one way running from private sector credit to domestic investment. The result indicated causality between stock market capitalization and domestic investment; however, while the causality was one-way, it was a reverse case running from domestic investment to the stock market capitalization.

4.9 Summary of Findings, Conclusion and Recommendation

For stability, reliability and policy application, diagnostic tests (unit root) and the CUSUM and CUSUM of squares test were applied on the model series and they were found to be stationary but of mixed order 1(0) and 1(1). The CUSUM and CUSUM of squares showed the model to be relatively stable. The lag length selection was based on the Alkaike information criteria (AIC)

which indicated lag 1 as fit for the data. The cointegration test was conducted using the ARDL Bounds test which showed evidence of long-run relationship of the variables, the f-stat was higher that the upper bound 1(1) at 5% level of significance [6.069912 > 4.01). The major findings of the study based on the long-run coefficients (of the autoregressive distributed lad – ARDL) estimation indicated that the treatment variables were significantly positive on the response variable [LOGBMS: coefficient =1.307036, p-value = 0.0012; LOGPSC: coefficient = 2.239779, p-value = 0.0002; and LOGSME: coefficient = 1.040740, p-value = 0.0034]. the exception was the interest rate which showed to be negative on domestic investment [INTR: coefficient = -0.149106, p-value = 0.1774], hence draws attention to theoretical postulation of a negative relationship between the rate of interest and investment. The empirical evidence on the positive impact of financial deepening on domestic investment concurs with Ezeoha, Ogamba and Onyiuke (2022); Akpan (2022) and Madubuike, Metu and Kalu (2021). However, while these studies showed significant coefficient of the treatment variables, the present study has shown that the financial deepening indicators have had no significant impact on domestic investment, a consequent confirmation that policy actions on deepening the financial sector has yet to produce the desired effect to spur rapid growth in domestic investment. The policy implication of these findings impinges on government and authorities in the financial sector to develop a roadmap to further deepen the financial space to drive growth in domestic investment. Based on the findings therefore, this study recommended that the financial authorities should strategize to satisfy the demand for business investment funds by expanding the broad money supply and the private sector credits. Also, the monetary policy interest rate should be reviewed down in order to reverse its negative effect on investments.

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