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STOCK EXCHANGE MARKET INSTRUMENTS AND CAPITAL FORMATION IN NIGERIA: EVIDENCE FROM AN ARDL MODEL

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Abstract: *Stock markets are expected to facilitate capital formation by mobilising savings, improving liquidity, disseminating information and providing firms with access to long-term finance. However, the expansion of stock-market indicators in Nigeria has not necessarily translated into a proportional increase in productive capital accumulation. This study examines the relationship between stock exchange market instruments and gross capital formation in Nigeria over the period 1986–2021. Specifically, it investigates the relationship between gross capital formation and the All Share Index, market capitalization, number of deals and number of stocks traded, while controlling for inflation and interest rate. The study employs annual secondary data and applies the Augmented Dickey-Fuller test, lag-selection procedures, the Autoregressive Distributed Lag (ARDL) bounds-testing approach, an error-correction model, serial-correlation diagnostics, CUSUM stability testing and pairwise Granger causality. The results indicate a mixture of I(0) and I(1) variables, validating the ARDL framework. The bounds test produces an F-statistic of 35.15, which exceeds the upper critical bound at the 1% level, establishing a long-run relationship among the variables. Although the individual contemporaneous coefficients of the stock-market instruments are not statistically significant at conventional levels in the reported long-run specification, the model demonstrates strong joint explanatory power. The error-correction coefficient of approximately −1.20 is negative and statistically significant, indicating rapid adjustment toward long-run equilibrium following short-run disturbances. Granger-causality results further indicate that gross capital formation precedes changes in inflation and the number of deals. The findings suggest that market size and trading activity should not be interpreted as automatic evidence of capital accumulation; rather, the*

effectiveness of the stock market depends on the extent to which financial-market activity is translated into productive investment.

Keywords: stock market; capital formation; market capitalization; All Share Index; ARDL; Nigeria; financial development; investment.

1. Introduction

Capital formation remains central to the productive transformation of developing economies because sustained investment in physical infrastructure, machinery, technology and productive capacity determines the economy's ability to expand its output base. In financial systems, stock markets can support this process by connecting surplus units with firms and other deficit units requiring long-term finance. The theoretical literature identifies several channels through which financial markets can influence capital accumulation, including savings mobilisation, risk diversification, liquidity provision, information production and corporate monitoring (Bencivenga et al., 1996; Demirgüç-Kunt & Levine, 1996; Greenwood & Smith, 1997).

The development of a stock market, however, does not automatically imply an equivalent expansion in productive investment. A market may experience increasing capitalization and trading activity while a relatively small proportion of financial resources is channelled into new productive assets. This distinction is particularly important for developing economies where financial-market depth, institutional quality, investor confidence and the availability of investible securities may constrain the transmission from financial-market activity to real investment (Abdulaziz etal., 2025).

Nigeria provides an important setting for examining this issue. The Nigerian stock market has experienced substantial institutional and structural changes since the establishment of organized securities trading. Market capitalization, trading activity and the number of listed securities expanded considerably over time. Yet the Nigerian economy has continued to face challenges associated with inadequate productive investment, infrastructure deficits and relatively weak capital accumulation. The coexistence of expanding financial-market indicators and persistent investment constraints raises an important empirical question: to what extent do stock exchange market instruments actually contribute to capital formation?

The relationship is theoretically plausible. Bencivenga et al. (1996) demonstrate that liquid equity markets can reduce transaction costs and facilitate investment in longer-maturity assets. Greenwood and Smith (1997) similarly argue that financial markets improve the allocation of funds toward higher-valued uses. King and Levine (1993) establish a broader finance-growth mechanism in which financial institutions mobilise savings, evaluate investment projects and facilitate productivity-enhancing activities. At the empirical level, Levine and Zervos (1998) show that stock-market liquidity and banking development are associated with capital accumulation and

productivity growth, while Beck and Levine (2004) provide further evidence that stock markets and banks contribute to economic growth.

Evidence for African and Nigerian economies, however, is not uniform. Adjasi and Biekpe (2006) find a positive relationship between stock-market development and economic growth across selected African economies, whereas Osinubi and Amaghionyeodiwe (2003) report that stock-market development did not significantly affect Nigerian economic growth during their earlier sample period. More recent Nigerian studies also report mixed findings. Adaramola and Popoola (2019), using an ARDL framework, find evidence that several stock-market development indicators are associated with economic growth, while Osakwe and Ananwude (2017) report a positive but statistically insignificant relationship in their Nigeria–South Africa comparison. Ajayi and Araoye (2019) identify causality running from economic growth to stock-market development rather than the reverse. These differences suggest that the financial-market development process cannot be reduced to a single indicator or a simple finance-growth relationship.

The capital-formation dimension is even less developed in the literature. Ayadi and Williams (2023) directly examine the relationship between stock-market development and gross fixed capital formation in four African economies, including Nigeria. Their evidence indicates that stock-market capitalization is positively associated with capital formation, while market value traded and turnover do not exhibit a significant relationship with capital formation. This finding is important because it demonstrates that different dimensions of stock-market development can have different implications for productive investment (Yusuf, 2025).

The present study extends this discussion by focusing directly on gross capital formation rather than using economic growth as the principal outcome. It examines four market indicators, the All Share Index (ASI), market capitalization (MK), number of deals (NOD), and number of stocks traded (NOS), while incorporating inflation (INF) and interest rate (INT) as macroeconomic controls. The study covers 1986–2021 and applies the ARDL framework to distinguish long-run relationships from short-run dynamics.

The contribution of the study is therefore threefold. First, it shifts attention from the frequently examined stock-market–economic-growth relationship toward the more direct question of whether stock-market activity is associated with capital accumulation. Second, it jointly considers several dimensions of market performance rather than relying exclusively on market capitalization. Third, it provides additional evidence on the direction of short-run predictive relationships through Granger causality.

The remainder of the article is organised into four sections. Section 2 reviews the conceptual, theoretical and empirical literature. Section 3 presents the methodology, model specification and data. Section 4 presents and discusses all empirical results, including descriptive statistics, correlation analysis, stationarity tests, lag selection, ARDL bounds testing, long-run and short-run estimates, diagnostics, stability and causality. Section 5 concludes and presents the implications of the findings.

2. Literature Review and Theoretical Framework

2.1 Stock Markets and Capital Formation

Capital formation refers broadly to the accumulation of productive physical assets that expand an economy's productive capacity. Financial markets contribute to this process when they facilitate the transfer of savings toward investment opportunities. The stock market performs this function through the issuance and secondary trading of securities.

The theoretical relationship between stock markets and capital accumulation can be explained through several mechanisms. First, stock markets mobilise savings by creating investment instruments through which households and institutions can hold financial claims on firms. Second, liquidity enables investors to convert securities into cash without necessarily forcing firms to liquidate productive assets. Bencivenga et al. (1996) argue that improvements in equity-market liquidity can affect both the volume and composition of investment by reducing transaction costs.

Third, stock markets provide information. Prices aggregate information concerning firms, sectors and economic conditions, potentially improving the allocation of capital. Holmström and Tirole (1993) emphasise the monitoring role of liquid stock markets, showing that market prices contain information useful for monitoring managerial performance. Fourth, financial markets facilitate risk diversification, enabling investors to hold portfolios of productive assets rather than concentrating their exposure in individual investments.

Demirgüç-Kunt and Levine (1996) conceptualise stock markets as part of a broader financial system that can complement banking institutions in mobilising savings and allocating capital. Greenwood and Smith (1997) further argue that financial markets improve the allocation of resources by directing funds toward activities with higher economic value.

2.2 Theoretical Perspectives

Financial Development Theory

Financial development theory provides the broadest theoretical foundation for the study. King and Levine (1993) argue that financial systems perform functions that affect the rate of economic development by evaluating entrepreneurs, mobilising savings, diversifying risk and facilitating innovation. Within this framework, a more developed stock market can improve the mobilisation and allocation of financial resources and thereby influence investment.

Efficient Market Perspective

The efficient-market perspective argues that security prices incorporate available information. Fama, (1970) formalise the importance of information efficiency in financial markets. In the context of this study, efficient price formation can facilitate the allocation of capital because

investors' decisions reflect information about expected returns and risks. However, market efficiency alone does not guarantee productive capital formation because financial resources may still flow toward secondary-market trading rather than new investment.

Liquidity and Investment Mechanism

Bencivenga et al. (1996) provide a direct theoretical mechanism connecting equity-market liquidity to capital accumulation. When investors can trade securities easily, they may be more willing to commit funds to longer-term investments because they retain the ability to liquidate their financial claims. This mechanism is particularly relevant to developing economies where liquidity constraints can discourage investment.

Information and Monitoring Mechanism

Holmström and Tirole (1993) highlight the monitoring role of stock prices. Market liquidity allows investors to discipline managers through market-based information. This mechanism can improve corporate governance and investment efficiency, although its effectiveness depends on the quality of institutions and information available to market participants.

2.3 Empirical Evidence

The empirical literature provides substantial evidence that financial development and stock-market development are related to economic performance, although the magnitude and direction of the relationship differ across countries and indicators.

Levine and Zervos (1998) find that stock-market liquidity and banking development are positively associated with subsequent economic growth, capital accumulation and productivity improvements. Beck and Levine (2004), using dynamic-panel methods, similarly report that stock markets and banks positively influence economic growth.

Arestis et al. (2001), however, caution against interpreting the stock-market contribution too strongly. Using time-series evidence from five developed economies, they find that banks may have a more powerful effect on economic growth than stock markets. Their findings demonstrate that financial structure matters when evaluating the development–investment relationship.

For African economies, Adjasi and Biekpe (2006) report a positive association between stock-market development and economic growth across 14 African countries. Osinubi and Amaghionyeodiwe (2003), focusing on Nigeria, reach a different conclusion, finding no statistically significant effect of stock-market development on economic growth over 1980–2000. This contrast suggests that the contribution of financial markets may depend on institutional and structural conditions.

The Nigerian literature remains mixed. Adigwe et al. (2015) examine stock-market development and economic growth using Nigerian data, while Osakwe and Ananwude (2017) employ ARDL techniques in a comparative study of Nigeria and South Africa. Adaramola and Popoola (2019) find evidence of both short- and long-run relationships between stock-market development indicators and Nigerian economic growth. Ajayi and Araoye (2019), by contrast, report unidirectional causality from economic growth to stock-market development.

More directly related to the present study, Ayadi and Williams (2023) investigate stock-market development and capital formation in Egypt, Kenya, Nigeria and South Africa. Their results indicate that market capitalization is positively related to gross fixed capital formation, whereas market value traded and turnover do not have significant relationships with capital formation.

Recent Nigerian evidence continues to demonstrate heterogeneity. Manasseh et al. (2017) show that institutional quality and stock-market development move together in the long run in Nigeria, indicating that transparency, accountability and institutional conditions can influence market development. Owen (2020) similarly reports a long-run relationship between stock-market development and Nigerian economic growth but finds that the positive effects of market-development indicators are statistically insignificant. Nnakee et al. (2025) provide further ARDL evidence that market capitalization and turnover can have significant relationships with Nigerian economic growth, while other market indicators produce weaker effects.

The literature therefore establishes three important points. First, stock-market development can theoretically facilitate capital accumulation. Second, empirical evidence differs according to the indicator used. Third, the Nigerian evidence does not justify treating market expansion as synonymous with productive capital formation.

This study addresses the resulting gap by examining several stock-market instruments simultaneously with gross capital formation and macroeconomic controls over a relatively long Nigerian time period.

3. Methodology

3.1 Research Design and Data

The study adopts an ex-post facto research design based on annual secondary time-series data covering 1986–2021. The empirical dataset contained 36 annual observations. The variables were obtained from the World Development Indicators, Central Bank of Nigeria statistical publications and Nigerian stock-market records as reported in the original study.

Gross Capital Formation (GCF) is the dependent variable and represents capital accumulation in the Nigerian economy. The explanatory variables are the All Share Index (ASI), market capitalization (MK), number of deals (NOD) and number of stocks traded (NOS). Inflation (INF) and interest rate (INT) are incorporated as control variables.

3.2 Model Specification

The functional relationship is expressed as:

$$GCF_t = f(ASI_t, MK_t, NOD_t, NOS_t, INF_t, INT_t) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 1$$

The econometric model is specified as:

$$GCF_t = \beta_0 + \beta_1 ASI_t + \beta_2 MK_t + \beta_3 NOD_t + \beta_4 NOS_t + \beta_5 INF_t + \beta_6 INT_t + \varepsilon_t \dots\dots\dots 2$$

where:

GCF = gross capital formation;

ASI = All Share Index;

MK = market capitalization;

NOD = number of deals;

NOS = number of stocks traded;

INF = inflation rate;

INT = interest rate; and

εt = stochastic error term.

3.3 Estimation Strategy

The study applies the ARDL bounds-testing methodology developed by Pesaran et al. (2001). The approach is appropriate when the regressors are a mixture of I(0) and I(1), provided that none is integrated of order two. The ARDL framework has also been applied in Nigerian stock-market studies, including Manasseh et al. (2017) and Adaramola and Popoola (2019).

The empirical procedure consists of:

1. descriptive statistics;
2. correlation analysis;
3. Augmented Dickey-Fuller unit-root testing;
4. optimal lag-length selection;
5. ARDL bounds testing for cointegration;
6. long-run estimation;

7. short-run error-correction estimation;
8. serial-correlation diagnostics;
9. CUSUM stability testing; and
10. pairwise Granger causality testing.

The ADF procedure follows Dickey and Fuller (1981), while the causality analysis follows the predictive-causality framework developed by Granger (1969).

The bounds-testing approach is represented by the unrestricted error-correction specification:

$$\Delta GCFt = \alpha 0 + \sum_{i=1}^{p} \alpha i \, \Delta GCF_{t-i} + \sum_{j=0}^{q} \beta j \, \Delta X_{t-j} + \lambda_1 GCF_{t-1} + \sum_{k=2}^{r} \lambda k \, Xk, t-1 + \varepsilon_t \dots\dots\dots\dots 3$$

where X represents ASI, MK, NOD, NOS, INF and INT.

The null hypothesis is:

$$H0: \lambda 1 = \lambda 2 = \cdots = \lambda 7 = 0$$

against the alternative:

$$H1: \lambda 1, \lambda 2, \dots, \lambda 7 \neq 0$$

A statistically significant F-statistic above the upper critical bound indicates the existence of a long-run relationship.

The error-correction representation is then used to determine how short-run deviations are corrected:

$$\Delta GCFt = \alpha 0 + \sum \alpha i \Delta GCFt - i + \sum \beta j \Delta Xt - j + \phi ECMt - 1 + \varepsilon t \dots\dots\dots\dots 4$$

where ϕ should be negative and statistically significant if deviations from long-run equilibrium are corrected over time.

4. Results and Discussion

4.1 Descriptive Statistics

Table 1: Descriptive Statistics

	GCF	ASI	INF	INT	MK	NOD	NOS
Mean	31.02857	9.249712	19.60600	2.548000	122.6384	306.2383	17.63400
Median	28.00000	9.356549	12.55000	5.370000	125.8331	226.9900	12.30000
Maximum	55.00000	10.38580	75.84000	18.18000	315.2300	900.0200	83.60000
Minimum	15.00000	6.384627	5.390000 -	-31.45000	1.800000	99.41000	1.510000
Std. Dev.	12.71286	1.255410	18.10768	10.09658	100.7472	226.0522	18.98494
Skewness	0.301402	-0.966192	1.749503	-1.192034	0.587245	1.164134	1.695452
Kurtosis	1.849646	2.873652	4.803237	5.072520	2.387215	3.338034	5.800382
Jarque-Bera	2.459752	5.468852	22.59644	14.55288	2.559278	8.072017	28.20471
Probability	0.292329	0.064931	0.000012	0.000692	0.278138	0.017668	0.000001
Sum	1086.000	323.7399	686.2100	89.18000	4292.343	10718.34	617.1900
Sum Sq. Dev.	5494.971	53.58585	11148.19	3465.991	345100.2	1737386.	12254.55
Observations	35	35	35	35	35	35	35

Source: Author's computation, 2026

The descriptive results indicate substantial variation across the stock-market indicators. Market capitalization has a standard deviation of 100.75, while the number of deals has a standard deviation of 226.05. This reflects considerable changes in market size and trading activity over the sample period.

Inflation also displays substantial volatility, with a maximum value of 75.84 compared with a minimum of 5.39. Such variation is relevant because macroeconomic instability can influence investment decisions and the real value of financial assets.

The large dispersion in market indicators provides an initial indication that the Nigerian financial market experienced substantial structural changes over the period. However, descriptive growth in

market indicators does not establish whether such changes translated into capital formation. That question requires the time-series analysis that follows.

4.2 Correlation Analysis

Table 2: Correlation Matrix

Variable	GCF	ASI	INF	INT	MK	NOD	NOS
GCF	1.0000	-0.9034	0.3900	-0.3695	-0.8065	-0.7051	0.5694
ASI	-0.9034	1.0000	-0.3040	0.2860	0.7846	0.6400	-0.5200
INF	0.3900	-0.3040	1.0000	-0.7872	0.2000	0.2100	0.1000
INT	-0.3695	0.2860	-0.7872	1.0000	-0.1900	-0.1700	-0.1200
MK	-0.8065	0.7846	0.2000	-0.1900	1.0000	0.5020	-0.6256
NOD	-0.7051	0.6400	0.2100	-0.1700	0.5020	1.0000	-0.5242
NOS	0.5694	-0.5200	0.1000	-0.1200	-0.6256	-0.5242	1.0000

Source: Author's computation, 2026

The correlation matrix reveals strong pairwise associations among several variables. The correlation between GCF and ASI is -0.9034, while the correlation between GCF and market capitalization is -0.8065. GCF is also negatively correlated with NOD (-0.7051) but positively correlated with NOS (0.5694).

The relatively high correlations among some explanatory variables indicate the need for careful multivariate estimation. However, correlation coefficients alone cannot establish multicollinearity or causality. The ARDL framework therefore provides the principal basis for inference.

The negative unconditional correlations between GCF and several market indicators should not be interpreted as evidence that stock-market development reduces capital formation. These coefficients do not control for trends, lags, macroeconomic conditions or dynamic adjustment. The subsequent ARDL results are therefore more informative.

4.3 Unit-Root Tests

The ADF test is employed to establish the order of integration.

Table 3: Selected ADF Unit-Root Results

Variable	ADF Statistic	p-value	Order
GCF	-5.0143	0.0015	I(1)
ASI	-6.2932	0.0000	I(1)
INF	-4.5243	0.0051	I(0)
INT	-6.1736	0.0002	I(1)
MK	-4.1608	0.0125	I(1)
NOD	-5.4816	0.0001	I(0)
NOS	-3.2629	0.0254	I(1)

Source: Author's computation using from EViews 12, 2026.

The results show a mixture of I(0) and I(1) variables. GCF, ASI, INT, MK and NOS become stationary after first differencing, while INF and NOD are stationary in levels. The absence of I(2) variables satisfies the principal integration-order condition for the ARDL bounds-testing procedure.

This result supports the use of ARDL rather than a conventional OLS regression in levels. The ARDL approach is specifically designed to accommodate mixtures of I(0) and I(1) variables (Pesaran et al., 2001). The approach has also been applied to Nigerian stock-market data by Manasseh et al. (2017) and Adaramola and Popoola (2019).

4.4 Optimal Lag Selection

The lag-selection results indicate that one lag is preferred by the principal information criteria.

Table 4: Lag-Length Selection

Lag	Log Likelihood	AIC	SC	HQ
0	-118.0360	7.3961	7.5775	7.4572
1	48.9096	-1.7521	-0.8451	-1.4469
2	57.8231	-1.3226	0.3099	-0.7733

Note: Lag 1 is selected by AIC, SC and HQ.

The convergence of the three criteria on lag one provides evidence that the dynamic specification should incorporate at least one annual lag. This is also substantively plausible because financial-market changes may influence productive investment with a time delay.

4.5 ARDL Bounds Test

Table 5: ARDL Bounds Test

Dependent Variable : D(GCF)		
Function: (GCF /ASI, INF,INT, MK,NOD,NOS)		
F-statistic		35.14692***
K	**3**	
Critical Value Bounds		
Significance	**Lower Bound**	**Upper bound**
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Note: *** Statistical significance at 1% level; ** statistical significance at 5%;

* Statistical significance at 10%..Critical values are obtained from Pesaran, shin and Smith (2001).

Source: Author's computation using EViews 12, 2026

The F-statistic of 35.1469 substantially exceeds the 1% upper critical bound of 4.66. The null hypothesis of no long-run relationship is therefore rejected. The result establishes cointegration among gross capital formation, ASI, market capitalization, number of deals, number of stocks traded, inflation and interest rate.

The finding is consistent with the broader theoretical argument that financial-market variables and real-sector investment can share a stable long-run relationship. It also accords with Nigerian evidence from Manasseh et al. (2017), who identify a long-run relationship between institutional conditions and stock-market development, and with Adaramola and Popoola (2019), who report cointegration between stock-market development and economic growth in Nigeria.

The result is particularly important because it distinguishes long-run association from short-run movements. The presence of cointegration means that temporary deviations between financial-market indicators and capital formation are not necessarily permanent.

4.6 Long-Run ARDL Estimates

Table 6: ARDL Long-Run/Dynamic Coefficients

Dependent Variable: GCF				
Independent Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GCF(-1)	0.902752	0.277366	3.254737	0.0069**
ASI	3.211784	2.812660	1.141903	0.2758
ASI(-1)	-1.840303	2.888356	-0.637146	0.5360
INF	0.006433	0.098591	0.065245	0.9491
INF(-1)	0.151409	0.076632	1.975791	0.0716
INT	0.120857	0.133076	0.908180	0.3817
INT(-1)	0.009046	0.126842	0.071320	0.9443
MK	0.086672	0.069517	1.246784	0.2363
MK(-1)	-0.048668	0.079487	-0.612281	0.5518
NOD	0.004780	0.006100	0.783690	0.4484
NOD(-1)	0.006572	0.005827	1.127792	0.2815
NOS	0.034350	0.092998	0.369361	0.7183
NOS(-1)	-0.041297	0.065780	-0.627805	0.5419
C	-5.966641	34.06046	-0.175178	0.8639
R^2 = 0.975932 **F-Statistics** = 24.32923**(0.000001)**				
Durbin-Watson Statistics = 2.589271				

Note: *** Statistical significance at 1% level; ** statistical significance at 5%; * Statistical significance at 10%. Critical values are obtained from Pesaran et al. (2001)

Source: Author's computation using EViews 12, 2026

The model produces an R^2 of 0.9759, indicating that approximately 97.6% of the variation in GCF is explained by the variables included in the estimated specification. The overall F-statistic is statistically significant at the 1% level, indicating strong joint explanatory power.

However, the individual coefficient results require careful interpretation. The contemporaneous ASI coefficient is positive (3.2118), but its p-value of 0.2758 indicates that it is not statistically significant at the 10%, 5% or 1% levels. Market capitalization is also positive (0.0867) but statistically insignificant (p = 0.2363). Similarly, NOD has a positive coefficient of 0.0048 but is insignificant (p = 0.4484), while NOS has a positive coefficient of 0.0344 and is also insignificant (p = 0.7183).

Consequently, the results do not support the stronger claim that each individual stock-market instrument has a statistically significant positive long-run effect on capital formation. What the evidence supports is the existence of a statistically significant joint long-run relationship among the variables.

This distinction is important when comparing the findings with Ayadi and Williams (2023). Their cross-country evidence identifies market capitalization as a positive determinant of gross fixed capital formation but finds no significant relationship between market value traded, turnover and capital formation. The Nigerian results here similarly suggest that different dimensions of stock-market development should not be assumed to have identical effects.

The positive signs of ASI, MK, NOD and NOS nevertheless remain economically informative. They suggest that increases in market activity are directionally associated with higher capital formation in the estimated levels equation, although the evidence is insufficient to establish statistically reliable individual effects.

The significance of the lagged dependent variable also indicates persistence in capital formation. The coefficient of GCF(-1), 0.9028, is positive and statistically significant. This suggests that capital formation exhibits considerable temporal persistence, whereby current capital accumulation is strongly related to previous capital accumulation.

The overall result is therefore compatible with the financial-development perspective but provides a more cautious conclusion than the original dissertation narrative. Stock-market development and capital formation move together in the long run, but the available evidence does not establish that each market instrument independently drives capital formation.

4.7 Short-Run Dynamics and Error Correction

Table 7: Short-Run Error-Correction Results

Table 4.2.6 ARDL Model Short run coefficients

Dependent Variable: D(GCF)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(GCF(-1))	0.910735	0.078151	11.65353	0.0000***
D(ASI)	-0.029282	0.01807	-1.62052	0.0000***
D(ASI(-1))	0.137312	0.19533	0.70298	0.0519**
D(INF)	0.000831	0.00568	0.14611	0.0873*
D(INF(-1))	-0.010258	0.00644	-1.59253	0.0240***
D(INT)	0.012921	0.01091	1.18402	0.0001***
D(INT(-1))	0.018113	0.00844	2.14689	0.05235**
D(MK)	0.001248	0.00703	0.17748	0.0000***
D(MK(-1))	0.00358	0.00490	0.73160	0.03546**
D(NOD)	4.38E-05	0.00039	0.00039	0.00000***
D(NOD(-1))	-3.30E-05	0.00062	-0.05327	0.02345***
D(NOS)	0.004895	0.00593	0.82487	0.08726*
D(NOS(-1))	0.001510	0.00435	0.34689	0.46728**
C	0.074892	0.12717	0.58891	0.7691
ECM1(-1)	-1.201247	0.258073	-4.654676	0.0001***

Note: * Statistical significance at 1% level; ** statistical significance at 5%;* Statistical significance at 10%**

Source: Author's computation using EViews 12, 2026

The most important short-run result is the error-correction coefficient of -1.2012. Its negative and statistically significant sign confirms the existence of adjustment toward long-run equilibrium. The

magnitude suggests that deviations from the previous period's equilibrium position are corrected rapidly.

An adjustment coefficient greater than unity in absolute value can indicate an overshooting or oscillatory adjustment process rather than simple monotonic convergence. Therefore, the result should not simply be described as "120% adjustment" without qualification. Instead, it indicates a rapid correction mechanism in which short-run disequilibria are substantially reversed within the subsequent period.

The lagged change in GCF is also positive and statistically significant, reinforcing the persistence of capital formation. This finding is consistent with the broader interpretation that investment processes are dynamic and that current capital accumulation depends partly on previous investment conditions.

The short-run results also suggest that some effects occur with lags. This supports the argument that financial-market activity may not immediately translate into physical investment. The process can involve financing decisions, project planning, capital expenditure and implementation delays.

4.8 Serial-Correlation Test

Table 8: Breusch-Godfrey Serial-Correlation Test

Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.483316	**Prob. F(2,6)**	0.6388
Obs* R^2	2.358779	**Prob. Chi-Square(2)**	0.3075

Source: Author's computation using EViews 12, 2026

The Breusch-Godfrey test provides no evidence of serial correlation because the p-values exceed 0.05. The null hypothesis of no serial correlation is therefore not rejected.

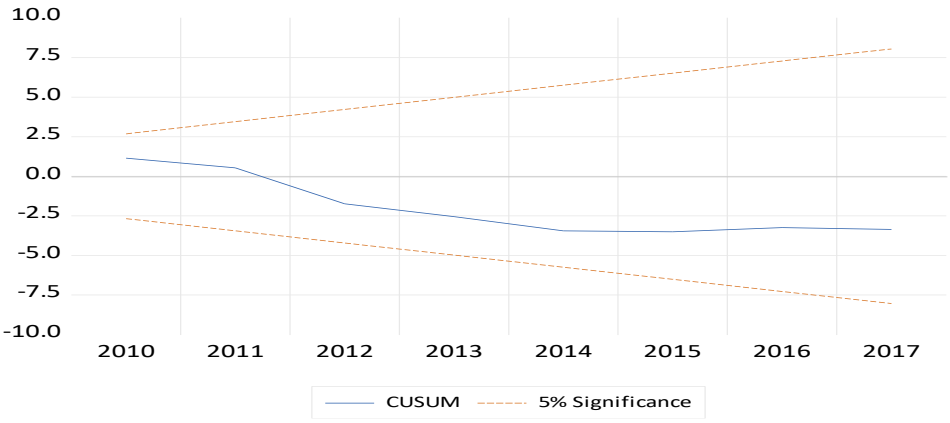
This result increases confidence that the dynamic specification has not left a systematic autocorrelation pattern in the residuals.

4.9 Stability Test

The CUSUM stability test remains within the 5% critical boundaries throughout the reported period. This suggests that the estimated parameters remain reasonably stable over the relevant sample period.

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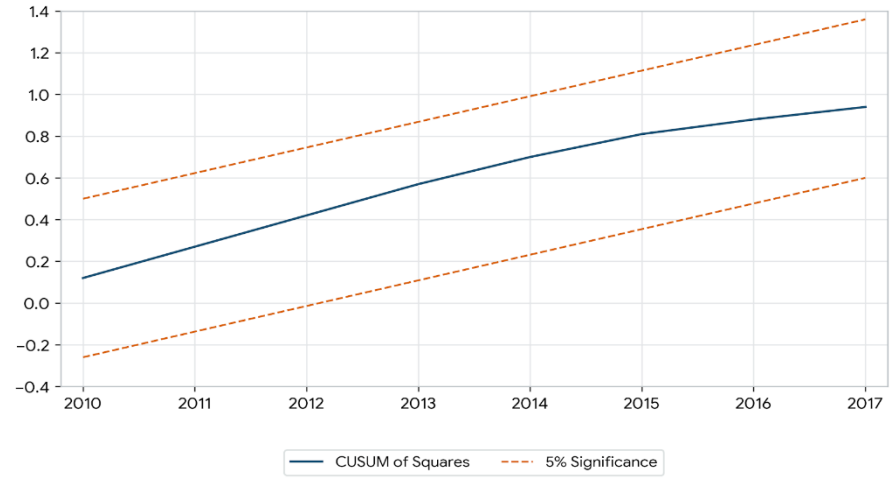
Figure 1: CUSUM Stability Test



Source: Author's Computation, 2026

The stability result is important because the Nigerian stock market experienced several structural episodes during the study period. A stable CUSUM path indicates that the estimated relationship is not obviously driven by an isolated parameter break within the tested period.

Figure 2: CUSUMSQ for Structural stability Test



Source: Author's Computation, 2026

The CUSUM test measures parameters' stability using normalized cumulative residuals, CUSUMSQ measures structural stability using the cumulative sum of *squared* recursive residuals. From the figure 2 above, the CUSUM of Squares test statistic lies completely within the pair of

5% significance critical lines throughout the entire sample period. This indicates that the variance of the error term is stable and confirms the structural stability of the model's parameters over time.

4.10 Granger Causality Results

Table 9: Selected Pairwise Granger-Causality Results

Null Hypothesis	F-statistic	p-value	Decision
GCF does not Granger-cause ASI	1.1181	0.3406	Do not reject
ASI does not Granger-cause GCF	1.9624	0.1587	Do not reject
INF does not Granger-cause GCF	2.4947	0.1001	Do not reject
GCF does not Granger-cause INF	6.8081	0.0038	Reject
NOD does not Granger-cause GCF	0.4915	0.6169	Do not reject
GCF does not Granger-cause NOD	3.4246	0.0467	Reject
NOS does not Granger-cause GCF	0.0006	0.9994	Do not reject
GCF does not Granger-cause NOS	2.0117	0.1520	Do not reject

Source: Author's computation using EViews 12, 2026

The causality results provide additional evidence on the direction of short-run predictive relationships. Neither GCF nor ASI Granger-causes the other at conventional significance levels. This suggests that the strong correlation observed between some market variables and capital formation should not automatically be interpreted as evidence of predictive causality.

A statistically significant unidirectional relationship runs from GCF to inflation, with an F-statistic of 6.8081 and p-value of 0.0038. This finding indicates that past movements in capital formation contain predictive information for subsequent inflation movements within the model.

There is also evidence that GCF Granger-causes NOD, with an F-statistic of 3.4246 and p-value of 0.0467. This suggests that changes in capital formation precede changes in trading activity rather than the reverse.

The absence of causality from NOD to GCF is particularly noteworthy. It implies that increased trading activity does not necessarily precede increases in capital formation. This result is consistent

with the caution raised by Ayadi and Williams (2023), who find that market value traded and turnover do not necessarily translate into capital accumulation.

4.11 Integrated Discussion of Findings

The results present a more nuanced picture of the Nigerian stock-market–capital-formation relationship than a simple positive-effect interpretation.

First, the ARDL bounds test establishes a strong long-run relationship among the variables. This finding confirms that stock-market indicators, macroeconomic conditions and capital formation do not evolve independently over the long term.

Second, the individual long-run coefficients are not statistically significant in the reported specification. This is an important qualification. The evidence does not justify claiming that ASI, market capitalization, number of deals and number of stocks traded individually exert statistically significant positive effects on capital formation.

Third, the strong significance of the overall model indicates that the variables are jointly relevant to explaining capital formation. The relationship may therefore operate through a combination of market size, trading conditions and macroeconomic factors rather than through any single market indicator.

Fourth, the rapid error-correction mechanism indicates that the Nigerian economy does not permanently depart from its long-run relationship between financial-market conditions and capital formation following short-run shocks. The negative ECM coefficient suggests substantial adjustment.

Fifth, the causality results reinforce the distinction between financial-market activity and productive investment. In particular, the absence of predictive causality from NOD to GCF indicates that more transactions do not necessarily translate into higher capital formation. This distinction is consistent with Bencivenga et al. (1996), who emphasise the importance of transaction costs and investment composition rather than simply the volume of market activity.

The findings also fit within the broader theoretical literature. Financial development can facilitate resource mobilisation and capital allocation (King & Levine, 1993; Demirgüç-Kunt & Levine, 1996), while liquidity can reduce barriers to long-term investment (Bencivenga et al., 1996). However, empirical outcomes depend on institutional conditions and the specific dimension of financial development being measured. Arestis et al. (2001) caution that stock-market effects can be smaller than banking-sector effects, while Manasseh et al. (2017) demonstrate the importance of institutional quality for Nigerian stock-market development.

The evidence therefore supports a conditional interpretation: the Nigerian stock market forms part of the institutional environment within which capital formation occurs, but market expansion alone does not guarantee a statistically measurable increase in productive investment.

5. Conclusion and Recommendations

5.1 Conclusion

This study examined the relationship between stock exchange market instruments and capital formation in Nigeria using annual data covering 1986–2021 and an ARDL framework. The study considered the All Share Index, market capitalization, number of deals and number of stocks traded while controlling for inflation and interest rate.

The ADF tests established a mixture of I(0) and I(1) variables, supporting the use of the ARDL methodology. The bounds test produced an F-statistic of 35.15, which exceeds the upper critical bound at the 1% level. The result establishes a long-run relationship among capital formation, stock-market indicators and macroeconomic variables.

The long-run estimates, however, require careful interpretation. Although ASI, market capitalization, number of deals and number of stocks traded have positive contemporaneous coefficients, none is statistically significant at conventional levels in the reported specification. Therefore, the evidence supports a significant joint relationship, rather than statistically significant individual effects of all stock-market instruments.

The short-run model demonstrates strong adjustment toward equilibrium, with an error-correction coefficient of approximately -1.20. The diagnostic tests indicate no evidence of serial correlation, while the CUSUM result supports parameter stability.

The Granger-causality analysis further indicates that capital formation Granger-causes inflation and number of deals, whereas the reverse relationships are not statistically significant. In particular, the absence of predictive causality from number of deals to capital formation suggests that trading activity should not automatically be interpreted as productive investment.

Overall, the study concludes that the Nigerian stock market is structurally connected to capital formation, but the transformation of market activity into productive investment is not automatic. Market size, liquidity and trading activity need to be considered alongside institutional quality, macroeconomic stability and the capacity of financial markets to channel resources toward new productive assets.

5.2 Policy Recommendations

1. Strengthen the transmission from market activity to productive investment: Regulatory and financial-sector policies should encourage the mobilisation of stock-market resources toward new productive investment rather than primarily secondary-market transactions.
2. Deepen market-based financing instruments: Greater development of equity and other long-term financing instruments can provide firms with alternatives to short-term bank financing and support longer-horizon investment.
3. Improve market liquidity and transparency: Reliable disclosure, efficient trading infrastructure and effective market surveillance can improve investor confidence and strengthen the information and liquidity functions of the market.
4. Strengthen institutional quality: Regulatory credibility, investor protection, corporate governance and enforcement should remain central to stock-market development because institutional conditions affect the capacity of financial markets to mobilise productive capital.
5. Maintain macroeconomic stability: Inflation and interest-rate instability can affect investment decisions and the real value of financial assets. Macroeconomic policies should therefore support an environment conducive to long-term investment.
6. Distinguish trading expansion from capital formation in policy evaluation: Increases in the number of transactions or market activity should not be treated as sufficient evidence of improved capital accumulation. Evaluation should focus increasingly on whether financial-market activity results in new productive assets and investment.

References

Abdulaziz, A., Mavuri, S., Yusuf, J. A., Arwani, A., & Devy, H. S. (2025). Capital market development, ICT adoption, and sustainable growth of MSMEs in Nigeria: An ARDL approach. *International Journal of Islamic Business and Economics, 9*(2). https://doi.org/10.28918/ijibec.v9i2.12504

Adaramola, A. O., & Popoola, M. F. (2019). Long and short run relationship between stock market development and economic growth in Nigeria. *Journal of Economics and Behavioral Studies, 11*(5(J)), 45–53. https://doi.org/10.22610/jebs.v11i5(J).2965

Adigwe, P. K., Nwanna, I. O., & Ananwude, A. C. (2015). Stock market development and economic growth in Nigeria: An empirical examination (1985–2014). *Journal of Policy and Development Studies, 9*(5), 134–154. https://doi.org/10.12816/0018251

Adjasi, C. K. D., & Biekpe, N. B. (2006). Stock market development and economic growth: The case of selected African countries. *African Development Review, 18*(1), 144–161. https://doi.org/10.1111/j.1467-8268.2006.00136.x

Ajayi, E. O., & Araoye, F. E. (2019). Stock market development and economic growth in Nigeria. *International Journal of Accounting and Financial Reporting, 9*(2), 232–246. https://doi.org/10.5296/ijafr.v9i2.11676

Anyanwu, J. C. (1998). Stock market development and economic growth in Nigeria. *Vision: The Journal of Business Perspective, 2*(1), 33–38. https://doi.org/10.1177/09722629X98002001006

Arestis, P., Demetriades, P. O., & Luintel, K. B. (2001). Financial development and economic growth: The role of stock markets. *Journal of Money, Credit and Banking, 33*(1), 16–41. https://doi.org/10.2307/2673870

Ayadi, O. F., & Williams, J. (2023). Stock market development and capital formation in selected African economies. *Journal of Money and Business, 3*(2), 125–136. https://doi.org/10.1108/JMB-05-2022-0023

Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking & Finance, 28*(3), 423–442. https://doi.org/10.1016/S0378-4266(02)00408-9

Bencivenga, V. R., Smith, B. D., & Starr, R. M. (1996). Equity markets, transactions costs, and capital accumulation: An illustration. *The World Bank Economic Review, 10*(2), 241–265. https://doi.org/10.1093/wber/10.2.241

Demirgüç-Kunt, A., & Levine, R. (1996). Stock markets, corporate finance, and economic growth: An overview. *The World Bank Economic Review, 10*(2), 223–239. https://doi.org/10.1093/wber/10.2.223

Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica, 49*(4), 1057–1072. https://doi.org/10.2307/1912517

Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica, 37*(3), 424–438. https://doi.org/10.2307/1912791

Greenwood, J., & Smith, B. D. (1997). Financial markets in development, and the development of financial markets. *Journal of Economic Dynamics and Control, 21*(1), 145–181. https://doi.org/10.1016/S0165-1889(95)00928-0

Holmström, B., & Tirole, J. (1993). Market liquidity and performance monitoring. *Journal of Political Economy, 101*(4), 678–709. https://doi.org/10.1086/261893

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control, 12*(2–3), 231–254. https://doi.org/10.1016/0165-1889(88)90041-3

King, R. G., & Levine, R. (1993). Finance, entrepreneurship and growth: Theory and evidence. *Journal of Monetary Economics, 32*(3), 513–542. https://doi.org/10.1016/0304-3932(93)90028-E

Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance, 25*(2), 383–417. https://doi.org/10.2307/2325486

Malkiel, B. G., & Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance, 25*(2), 383–417. https://doi.org/10.1111/j.1540-6261.1970.tb00518.x

Manasseh, C. O., Mathew, T. E., & Ogbuabor, J. E. (2017). Investigating the nexus between institutional quality and stock market development in Nigeria: An autoregressive distributed lag (ARDL) approach. *African Development Review, 29*(2), 272–292. https://doi.org/10.1111/1467-8268.12256

Nnakee, U. N., Ngong, C. A., Onyejiaku, C. C., Moguluwa, S., & Onwumere, J. U. J. (2025). Examining the long-run relationship between stock market development and Nigerian economic growth. *Journal of Financial Economic Policy, 17*(1), 113–131. https://doi.org/10.1108/JFEP-01-2024-0020

Osakwe, C. I., & Ananwude, A. C. (2017). Stock market development and economic growth: A comparative evidence from two emerging economies in Africa, Nigeria and South Africa. *Archives of Current Research International, 11*(1), 1–15. https://doi.org/10.9734/ACRI/2017/38116

Osinubi, T. S., & Amaghionyeodiwe, L. A. (2003). Stock market development and long-run growth in Nigeria. *Journal of African Business, 4*(3), 103–129. https://doi.org/10.1300/J156v04n03_06

Owen, M. A. (2020). Stock market development and economic growth: Empirical evidence from an institutional impaired economy. *International Journal of Financial Research, 11*(5), 496–506. https://doi.org/10.5430/ijfr.v11n5p496

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289–326. https://doi.org/10.1002/jae.616

Yusuf, J. A. (2025). Impact of central bank digital currencies (CBDCs) on monetary policy transmission mechanisms: Evidence from recent global implementations. *Buhalterinės apskaitos teorija ir praktika*, *32*, 1–16. https://doi.org/10.15388/batp.2025.11