

**THE ROLE OF THE NIGERIAN STOCK EXCHANGE IN CAPITAL
FORMATION**

BY

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DEPARTMENT OF ECONOMICS

FACULTY OF SOCIAL SCIENCE

UNIVERSITY OF BENIN

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**BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF ECONOMICS,
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CERTIFICATION

This is to certify that this work titled "THE ROLE OF THE NIGERIAN STOCK EXCHANGE IN CAPITAL FORMATION" was carried out by AISHAT CHINAGOROM KADIRI with matriculation number SSC2105577 and has been approved in partial fulfillment of the requirement for the award of Bachelor of science (B.Sc) degree in the Department of Economics, Faculty of Social Sciences, University of Benin.

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DEDICATION

This work is dedicated to the Almighty God, whose grace, guidance, and strength have sustained me throughout my academic journey. I also dedicate this project to my late father, Mr. Gafaru Kadiri, your legacy continues to guide me every day. I wish you were here to witness this milestone and to my heart loved ones for their endless support, love, and belief in me, even when I doubted myself.

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ABSTRACT

This study examines the role of the Nigerian Exchange Group (NGX), in promoting capital formation within the Nigerian economy. The research evaluates how the issuance of securities and market capitalization influence gross fixed capital formation (GFCF), which serves as a proxy for investment. Annual time series data spanning from 1985 to 2023 were analyzed using the Autoregressive Distributed Lag (ARDL) model to capture both short-run and long-run dynamics between the stock market and capital formation. The results reveal evidence of a long-run equilibrium relationship among the variables, confirming that the stock market have significant implications for capital formation in Nigeria. However, the direction of these effects is mixed. The issuance of securities exhibits a positive but statistically weak short-run impact, while its lagged values show negative and significant effects, suggesting that funds raised through new issues are not always efficiently channelled into productive investments. Similarly, market capitalization exerts a negative long-run influence on capital formation, indicating that growth in the market's value has not consistently translated into real sector investment. In contrast, domestic credit exerts a strong positive effect on capital formation, while the real lending rate shows a significant negative effect, underscoring the importance of credit availability and affordable borrowing costs for investment growth. The study concludes that the Nigerian Stock Exchange plays a vital, role in mobilizing long-term funds for productive investment. It recommends that regulators strengthen market transparency, deepen public participation, promote broader access to financing instruments and ensuring macroeconomic stability to enhance the stock market's capacity to support sustainable capital formation and economic growth in Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Economic growth cannot be fully explained without considering the role of capital formation. Capital formation has been recognized by economists as a key determinant of modern economic progress. Theories of economic development emphasize that societies do not devote all productive efforts to immediate consumption but allocate part of their resources to the creation of capital goods that expand future productive capacity. Formally, capital formation is the national expenditure in a given time period on physical and productive assets e.g buildings, civil engineering works, machinery, equipment and vehicles (Rutherford, 2002). Capital formation encompasses both tangible assets such as machinery and infrastructure, and intangible assets such as education, health, and scientific research(Singer, 1989). Jhingan (2007) observed that capital formation enables developing countries to break out of the vicious cycle of poverty by providing the capital base necessary for production, investment, and income generation (Jhingan, 2007). In this study, the stock market is regarded as a platform for mobilizing long-term funds and can

be linked theoretically to the process of capital accumulation and economic development. The Nigerian financial system consists of two broad segments: the money market, which deals in short-term instruments, and the capital market, which facilitates long-term financing. The Nigeria Exchange Group (NGX) is an arm of the capital market. The Nigerian Exchange Group (formerly the Nigerian Stock Exchange) plays a pivotal role in mobilizing long term capital for investment , industrialization, and infrastructure development by channeling surplus savings from individuals and institutions into productive ventures. Within this framework, the Nigerian Exchange Group (NGX) is the central institution responsible for mobilizing long-term funds through the issuance and trading of securities.. Established in 1960 as the Lagos Stock Exchange and renamed the Nigerian Stock Exchange in 1977, it became the Nigerian Exchange Group in 2021. Over the decades, the institution has grown from a modest trading platform to a modern institution with electronic trading systems, diversified listings, and a market capitalization of about US\$68.1 billion(₦35 trillion), with over 300 listed securities as of 2024. It has been central in facilitating privatization of state-owned enterprises, broadening public ownership of companies, and providing investment opportunities to both institutional and individual investors (Alile, 1997; Soyode, 1990).

The stock market contributes to capital formation through two primary mechanisms: the primary market and the secondary market. In the primary market, new securities such as shares and bonds are issued, allowing firms and governments to mobilize long-term funds for investments in infrastructure, manufacturing, energy, and other growth-enhancing sectors. The secondary market, on the other hand, provides liquidity by enabling investors to trade existing securities. This liquidity strengthens investor confidence and makes it easier for firms to raise fresh capital in the primary market (Sule & Momoh, 2009).

In theory, therefore, a well-functioning stock market should facilitate resource mobilization, promote efficient allocation of funds, and ultimately accelerate capital formation. Indeed, cross-country studies suggest that economies with deeper and more active stock markets tend to experience stronger industrialization and more sustained growth (Levine & Zervos, 1998) .

Despite its potential, the Nigerian stock market faces structural challenges that may constrain its contribution to capital formation. First, market depth is shallow. With fewer than 300 listed firms, Nigeria lags behind comparable emerging economies that boast thousands of active companies and significantly higher capitalization-to-GDP ratios

(World Bank, 2023). Second, access to capital remains restricted, especially for small and medium-sized enterprises (SMEs), which continue to depend heavily on expensive bank credit due to high listing costs and regulatory barriers (Akinlo & Egbetunde, 2010). Third, public participation is low, as only a fraction of Nigerians invest in equities. Low financial literacy, weak investor confidence, and governance failures especially in the aftermath of the 2008 stock market crash which have further discouraged participation (Okonkwo & Nwanna, 2020). These weaknesses raise questions about whether the Exchange has lived up to its potential as a driver of capital formation.

Scholarly findings on the relationship between the stock market and capital formation in Nigeria have mixed results. On the positive side, studies such as Sule & Momoh (2009) and Ewah, Esang, & Bassey (2009) reported that stock market development contributes significantly to capital formation and growth in Nigeria. They argued that increased listings, improved capitalization, and greater investor participation have historically boosted investment activity.

On the other hand, (Osinubi & Amaghionyeodiwe 2003) and (Nwaolisa, Kasie, & Egbunike (2013) found that the stock market's contribution remains negligible. They attributed this to speculative trading, structural weaknesses, shallow depth, and the

tendency for capital inflows to chase short-term gains rather than support long-term investment. Comparative research by (Levine and Zervos 1998) further suggests that Nigeria's stock market has underperformed relative to peers, where capital markets have played more effective roles in financing industrial expansion and infrastructure.

This divergence in findings points to the need for fresh empirical investigation, particularly with more recent data covering the post-reform period, the 2008–2009 global financial crisis, the 2016 recession, and the market's recovery in the 2020s.

Recent data highlight the persistence of Nigeria's capital formation problem. According to the World Development Indicators (2023), Nigeria's gross capital formation as a percentage of GDP averaged only 19% between 2000 and 2023. This falls short of the Sub-Saharan African average of 23% and well below the 30–35% required for sustainable growth. During the same period, the stock market experienced significant volatility, with steep declines during the global financial crisis of 2008–2009 and the domestic recession of 2016, followed by partial recoveries. Yet these stock market fluctuations have not consistently translated into higher levels of capital accumulation. However, these fluctuations did not consistently translate into steady improvements in capital accumulation, raising concerns about causality.

1.2 Statement of the research problem

The research problem of the study is the contribution of the Nigerian Stock Exchange (NGX) to capital formation. The Nigerian capital market, of which the NGX is a key arm, is expected to mobilize long-term funds, channel them into productive investments, and thereby stimulate economic growth. However, several persistent issues suggest that this expected role has not been fully realized.

First, the depth of the Nigerian stock market remains relatively shallow. As of 2025, the Johannesburg Stock Exchange (JSE) has over 400 listed companies, whereas the Nigerian Exchange (NGX) has only about 150–155 listed firms. While the JSE is the largest stock exchange in Africa, the NGX remains a smaller, though significant, exchange in the region (BusinessDay, 2025). Other indicators such as the market capitalization-to-GDP ratio, trading volumes, and the number of listed companies show that Nigeria lags behind other emerging economies.

Second, access to long-term financing through the Exchange is still limited. Many firms, particularly small and medium-scale enterprises (SMEs), either cannot or do not list their securities due to regulatory barriers, costs of compliance, or market volatility. Consequently, businesses rely more on short-term and high-cost bank loans than on

raising funds in the capital market.

Third, the level of public participation in the stock market is low. Despite Nigeria's population of over 200 million, retail investors are estimated at only about 3 million, representing less than 5% of the population (Punch, 2019). Furthermore, many Central Securities Clearing System (CSCS) accounts remain inactive, indicating weak trading activity (Nairametrics, 2025). This reflects issues of financial illiteracy, weak investor protection, governance challenges, and the lingering effects of past market crashes have reduced confidence in the market as a reliable channel for investment and wealth creation. In addition, the range of financial instruments remains narrow compared to more developed markets, limiting the ability of the Exchange to diversify investment options and broaden its investor base.

A critical gap in knowledge is that most existing studies on the Nigerian stock market concentrate on secondary market indicators such as market capitalization, turnover ratio, or the All-Share Index. While these are important, they do not fully capture the direct role of the primary market, where new securities are issued to raise fresh capital for investment. Since economic units raise capital in the primary market, it is necessary to evaluate both the issuance of securities and secondary market performance to understand

their respective impacts on capital formation in Nigeria.

It is against this background that the study seeks to evaluate the performance of the Nigerian Stock Exchange in terms of its trading activities and determine whether, and to what extent, it contributes to capital formation in Nigeria.

1.3 The research question

From the statement of the research problem, the research question of the study are;

1. To what extent does the issuance of securities in the Nigerian Stock Exchange influence capital formation?
2. What is the impact of market capitalization on capital formation in Nigeria?

1.4 Objective of the study

The general objective of this study is to examine the contribution of the Nigerian Stock Exchange to capital formation in Nigeria.

The specific objectives are to;

1. Determine how the issuance of securities in the Nigeria stock market influences capital formation in Nigeria.
2. Assess the impact of market capitalization on capital formation in Nigeria.

1.5 Hypotheses of the study

The hypotheses of the study are:

1. The issuance of securities in Nigeria stock market has no significant effect on capital formation in Nigeria.
2. Market capitalization has no significant impact on capital formation in Nigeria.

1.6 Scope of the study

This study focuses on assessing the role of the Nigerian Stock Exchange, which has been demutualized and is now known as the Nigerian Exchange Limited, a subsidiary of the Nigerian Exchange Group, in capital formation within the Nigerian economy. In particular, the study examines two key aspects of stock market activities: the new issues in the primary market and the level of market capitalization, both of which serve as indicators of how the stock market contributes to mobilizing long-term funds for investment.

The period under review spans from 1985 to 2023, capturing significant economic reforms, stock market fluctuations, and structural changes in Nigeria's financial system.

Geographically, the study is restricted to Nigeria, with the NGX serving as the central

institution representing the capital market.

While the capital market operates within a broader financial system regulated by institutions such as the Securities and Exchange Commission (SEC), the scope of this study is limited to stock market activities carried out through the NGX. It does not extend to informal capital markets or unlisted intermediaries.

By concentrating on new issues and market capitalization, the study narrows its focus to factors that directly aligned with the research objectives. This makes it possible to evaluate how the stock market has influenced capital formation, while excluding broader issues such as policy reforms, corporate governance, or financial innovation, which fall outside the present research boundaries.

1.7 Significance of the study

The study examine the usefulness of the Nigerian Stock Exchange as a vehicle for capital market and how the Nigerian Stock Exchange contributes to capital formation . The research will yield insights into the effectiveness of the Exchange in mobilizing long-term funds, the key challenges facing the market, and practical policy options that can improve its capacity to support investment and national development.

The study would also be a veritable tool for policymakers and regulators by offering

evidence-based recommendations for strengthening market regulation, improving investor protection, and designing strategies to deepen financial inclusion. Private sector firms, particularly those seeking to raise capital, will benefit from understanding how best to access public markets. Investors and financial analysts will gain clearer insights into market dynamics, risks, and opportunities related to long-term investments. Lastly, academics and students will find the study useful as a reference for further research on capital markets, financial development, and economic policy in Nigeria.

1.8 Structure of the study

This study consists of five chapters. Chapter 1 which is the introductory part contains the introduction , the statement of research problems, objective of the study, research questions, research hypothesis, structure of the study, significance of the study, scope of the study . Chapter 2 is dedicated to the literature review. Chapter 3 contains theoretical framework and methodology. Chapter 4 is presentation of results and interpretation. Chapter 5 is summary, conclusion and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Clarification

In this section, the core concepts central to the study, capital formation, market capitalization, volume of stock traded, inflation, and the Nigerian Stock Exchange are explained in detail. Each variable is defined, examined from both economic and financial perspectives, and linked to measurable indicators used in empirical studies. The specific measures adopted in this study are also identified.

2.1.1 Capital Formation

Capital formation is a fundamental concept in macroeconomics, representing the process through which an economy increases its stock of capital goods over time. It involves converting savings into productive investments in physical assets like machinery, equipment, buildings, and infrastructure that contribute to economic output. Capital formation is closely linked to investment and is essential for expanding the productive capacity of an economy (Jhingan, 2012). Capital accumulation or formation refers to the process of amassing or stocking of assets of value, the increase in wealth or the creation

of further wealth.

Capital formation can be differentiated from savings because accumulation deals with the increase in stock of needed real investments, while savings denote the portion of income not consumed, not all savings are automatically translated into productive investment. Most economic literature has confused investment with capital formation. Investment can be in financial assets, human (capital) development, real assets that can be productive or unproductive. However, it is the increase in non-financial and productive assets that contributes directly to growth in output and employment (Adekunle & Aderemi 2012).

The Central Bank of Nigeria (2007), defines capital formation as the total change in the value of fixed assets in the economy in addition to fixed assets either for replacing or adding to the stocks, it refers to the increase in the fixed capital stocks of the capital formed. Governments by their autonomous investment influence the direction of other investment by crowding in other investment as desired. The process of capital formation usually occurs in three stages: (i) savings, where individuals, firms, and governments set aside part of their income; (ii) mobilization of savings, often through financial institutions and capital markets; and (iii) investment, where these mobilized resources are transformed into productive assets. From a development perspective, capital formation is

vital because it expands productive capacity, enhances technological progress, generates employment, and supports structural transformation of the economy. In developing countries like Nigeria, it is often viewed as the key to breaking the vicious cycle of poverty and underdevelopment by providing the foundation for sustained growth.

Capital formation is commonly measured using Gross Capital Formation (GCF). GCF includes gross fixed capital formation, changes in inventories, and acquisitions of valuables. Among these, the most widely used indicator is Gross Capital Formation as a percentage of Gross Domestic Product (GDP), which shows the proportion of national income allocated to investment rather than consumption. This measure is adopted in the present study to capture the role of the Nigerian Stock Exchange in influencing capital accumulation.

2.1.2 Issuance of Securities

The issuance of securities refers to the process by which financial instruments are offered in the primary market to raise funds for investment and development. Securities may be broadly classified into equity instruments, which signify ownership rights in a company, and debt instruments, which represent a creditor relationship with either corporate entities or governments. In the equity segment, new funds are raised through Initial Public

Offerings (IPOs), where firms issue shares to the public for the first time, marking its official listing on the Nigerian Exchange Group (NGX). An IPO enables firms to raise substantial capital for expansion and modernization (Ritter, 2011), and Follow-on Public Offers (FPOs), in which companies already listed on the stock exchange issue additional shares to mobilize further capital, this allows firms to sustain growth and finance new projects (CBN, 2022).. A related form of equity issuance is the rights issue, which allows existing shareholders to purchase additional shares, usually at a discounted rate and in proportion to their existing holdings , thereby strengthening the capital base of the issuing firm(Osamwonyi, 2005). On the other hand, the debt market accommodates the issuance of bonds, debentures, and other long-term instruments, which serve as borrowing channels for both corporate bodies and governments. Investors who purchase bonds lend money to the issuer in exchange for periodic interest payments and repayment of principal at maturity. In Nigeria, both corporate bonds and Federal Government bonds (FGN Bonds) are widely issued to finance infrastructure and industrial projects (CBN, 2022).

The new issues is typically measured by the number and value of new issues in the primary market. Indicators include the total capital raised through IPOs, right issues and

bond issues within a given period. In this study, the focus is on the total value of new issues as provided by the Nigerian Exchange Group and the Securities and Exchange Commission (SEC Nigeria, 2023), since it best captures the capacity of the stock market to mobilize resources for capital formation.

2.1.3 Market Capitalization

Market capitalization refers to the total market value of all shares that are outstanding on a stock exchange at a given time. It is obtained by multiplying the current price of a company's share by the number of shares the company has issued. When this is summed across all companies listed on the exchange, it gives the overall market capitalization of the stock market (Levine & Zervos, 1998). Market capitalization serves as a reflection of investors' confidence, market depth, and the capacity of the stock exchange to mobilize funds for productive investment (Bekaert & Harvey, 2003).

This concept is widely used as an indicator of stock market size and development. A large and growing market capitalization suggests that the stock exchange plays a significant role in mobilizing funds, and it often reflects stronger investor confidence in the economy. On the other hand, low capitalization may indicate shallow market participation, weak confidence, or undervaluation of listed companies.

Market capitalization can be reported in absolute monetary terms, usually in the local currency such as the Nigerian Naira. Market capitalization has been used as one of the most widely adopted proxies for measuring stock market development. It is often expressed as a ratio of market capitalization to Gross Domestic Product (GDP), which reflects the extent to which the stock market contributes to national wealth and capital formation (Levine, 1996). However, for comparative and analytical purposes, it is often expressed relative to Gross Domestic Product (GDP). The market capitalization-to-GDP ratio provides a clearer picture of how much the stock market contributes to the economy. In this study, market capitalization is measured using the market capitalization-to-GDP ratio, as it better reflects the contribution of the Nigerian Stock Exchange to capital formation within the broader economy.

2.1.4 Nigerian Stock Exchange

The Nigerian Stock Exchange (NSE), now known as the Nigerian Exchange Group (NGX), is an arm of the capital market. It serves as the institutional framework for mobilizing long-term capital by allowing firms and governments to raise funds through instruments such as initial public offerings (IPOs), follow-on public offerings (FPOs), rights issues, and corporate or government bonds. By providing this formal platform, the

stock exchange channels savings from surplus units into productive investments, thereby fostering capital formation.

In addition to the primary market, the NSE also operates a secondary market, where already issued securities are bought and sold among investors. Although the secondary market does not provide new capital directly to firms, it plays a vital role in sustaining investor confidence by ensuring liquidity, that is, the ability of investors to convert their securities into cash when needed. This liquidity encourages participation in the primary market, making it easier for companies to raise funds initially.

The NSE also performs important roles in ensuring transparency, price discovery, and investor protection. By regulating listing requirements and trading activities, it strengthens confidence in the market and enhances its capacity to mobilize resources for development.

The contribution of the NSE to the Nigerian economy is often evaluated through indicators such as market capitalization and the issuance of securities, which capture both the size of the market and its ability to support capital formation.

In this study, the NSE is not examined as a direct variable. Instead, its role is captured through market capitalization and issuance of securities, which serve as the independent

variables reflecting its operations in relation to capital formation.

2.2 Review of Theoretical Literature

Understanding the theoretical foundation of the relationship between stock market activities and capital formation requires an exploration of key economic theories that explain how financial markets influence investment, savings mobilization, and productive capital accumulation. Each theory is discussed in relation to its relevance to capital formation and the role of capital markets.

2.2.1 Harrod-Domar Growth model

The Harrod–Domar Growth Model, independently developed in the mid 20th century by Roy F. Harrod (1939) and Evsey Domar (1946), provides a formal framework for understanding the relationship between savings, investment, and economic growth. The model asserts that the rate of economic growth in an economy depends on two key factors: the level of savings and the productivity of capital, usually expressed as the capital-output ratio. According to the model, higher savings enable greater investment, which, when applied efficiently, expands the stock of capital and increases output. Conversely, insufficient savings or inefficient investment can constrain growth. The focus

on the Harrod–Domar model is the emphasis on investment as the primary driver of economic expansion. Unlike classical theory, which focuses broadly on the accumulation of capital, the Harrod–Domar model links the rate of growth directly to the proportion of savings that is channeled into productive investment. Although, this model was developed for advanced countries, it’s particularly useful in analyzing economies where capital formation is constrained by low domestic savings and limited access to finance, as is often the case in developing countries.

In this study, the Harrod–Domar model highlights the critical role of the Nigerian Stock Exchange in facilitating investment and capital formation. By providing a platform for the issuance of securities, the NSE mobilizes domestic savings and directs them into productive projects. A vibrant stock market allows firms to raise capital through equity issuance, and investors to earn returns, thus encouraging savings and reinvestment. This increases the effective capital stock available for firms and enhances overall economic growth. The model thus provides a theoretical justification for investigating how stock market activities, particularly equity issuance and market capitalization, influence capital formation in Nigeria.

While the Harrod–Domar model underscores the importance of savings and investment, it assumes that capital can be fully and efficiently employed, ignoring structural and institutional constraints. In reality, factors such as market inefficiencies, regulatory challenges, and volatility in financial markets may limit the effectiveness of savings in generating productive investment. Nonetheless, the model remains a valuable lens for understanding the link between savings, investment, and capital accumulation.

2.2.2 Financial Intermediation Theory

The Financial Intermediation Theory emphasizes the role of financial institutions, including banks and stock exchanges, in channeling funds from savers to borrowers and facilitating investment. Early scholars such as Gurley and Shaw (1960) argued that financial intermediaries reduce information asymmetry, lower transaction costs, and manage risk, thereby making capital more efficiently available to productive ventures. By mobilizing savings and allocating them to sectors where they yield the highest returns, financial intermediaries support capital accumulation and economic growth.

One assumption of this theory is that financial intermediaries operate efficiently, providing liquidity, risk management, and monitoring services that encourage both saving and investment. The stock market, as a formal financial intermediary, plays a central role

by enabling firms to raise funds through equity and debt issuance while providing investors with transparent and regulated avenues for participation. In this sense, the stock exchange not only mobilizes resources but also improves the quality of capital allocation.

In this study, the Financial Intermediation Theory explains the mechanisms through which the Nigerian Stock Exchange contributes to capital formation. By acting as a bridge between surplus and deficit units in the economy, the NSE ensures that savings are converted into productive investment. The issuance of new securities, the trading of existing shares, and the provision of liquidity all enhance the flow of funds into sectors that expand productive capital.

The theory assumes that financial intermediaries are efficient and effective in their operations, but in reality, challenges such as regulatory weaknesses, market inefficiencies, and low investor confidence may limit their ability to fully mobilize and allocate capital.

Despite these constraints, the theory provides a strong conceptual framework for understanding the critical role of the stock market in enhancing investment and capital accumulation.

2.2.3. McKinnon-Shaw Financial Liberalization Theory

The McKinnon-Shaw Financial Liberalization Theory, developed by Ronald McKinnon (1973) and Edward Shaw (1973), emerged from studies of developing economies where financial repression was limiting economic growth. The McKinnon-Shaw hypothesis posits that financial repression characterized by artificially low interest rates, high reserve requirements, and directed credit policies discourage savings, reduce the availability of funds for investment, and distort capital allocation. McKinnon-Shaw hypothesis states that financial liberalization and stock market development would promote economic growth through their effects on the growth rate of savings, investment, and thus economic growth. Financial liberalization entails removing these distortions and allowing interest rates and credit allocation to be determined by market forces.

A key assumption of the theory is that higher real interest rates encourage more savings, thereby expanding the pool of loanable funds for productive investment. Furthermore, well-functioning financial markets, including stock exchanges, promote efficiency by directing resources to the most productive sectors. It was noted that this idea was adopted by great international institutions such as the International Monetary Fund (IMF) and the World Bank.

Thus, many developing countries have implemented financial liberalization policies with the aim to delete the repressed regime. The financial liberalization policies were aimed at liberalizing interest rates by switching from an administered interest rate setting to a market-based interest rate determination; reducing controls on credit by gradually eliminating directed and subsidized credit schemes; developing primary and secondary securities markets; enhancing competition and efficiency in the financial system by privatizing nationalized commercial banks

Applied to Nigeria, the theory highlights the role of a liberalized financial system in enabling the Nigerian Stock Exchange to mobilize savings and channel them into investment. By reducing restrictive regulations and fostering competition, the stock market becomes better positioned to support capital formation through the issuance and trading of securities.

The theory assumes that financial liberalization automatically leads to higher savings and investment, but in practice, outcomes depend on institutional quality, regulatory enforcement, and investor confidence. In some developing economies, liberalization without strong institutions may lead to financial instability rather than enhanced capital formation. Nevertheless, the McKinnon–Shaw theory remains highly relevant for

understanding the conditions under which the stock market can effectively facilitate investment and capital accumulation.

2.2.4 Tobin's Q Theory of investment

The Tobin's Q Theory of Investment, developed by James Tobin (1969), provides a modern perspective on how market valuations influence investment decisions. Tobin introduced the concept of "Q," which is the ratio of the market value of a firm's assets to the replacement cost of those assets. When Q is greater than one, the market values the firm's existing capital more than its replacement cost, signaling that investment in new capital is profitable. Conversely, a Q less than one indicates that investment may not yield adequate returns, discouraging capital expansion.

A key assumption of the theory is that investors and firms respond rationally to market signals. The stock market, therefore, serves not only as a platform for raising capital but also as a mechanism for signaling the profitability of investment opportunities. High market valuations encourage firms to issue new shares or expand operations.

In this study, Tobin's Q theory is particularly relevant because it provides a theoretical explanation for how fluctuations in the Nigerian Stock Exchange's market capitalization can influence the accumulation of productive capital. When stock prices rise and market

values increase, firms are more likely to undertake new investments funded by equity issuance.

While Tobin's Q provides valuable insights into investment decisions, it assumes efficient markets and rational investor behavior, which may not fully hold in developing economies like Nigeria. Market volatility, information asymmetry, and speculative trading can distort the Q ratio, affecting its predictive power. Nonetheless, the theory remains highly relevant for understanding the connection between market valuation and capital formation.

2.2.5 Accelerator Theory of Investment

The Accelerator Theory of Investment was first introduced by J.M. Clark in 1917 and later refined by subsequent economists such as Chenery (1952). The theory provides an explanation of how fluctuations in output or demand affect the level of investment in an economy. Its central argument is that firms require capital to produce goods and services, and there exists a stable relationship between the desired stock of capital and the level of output. Thus, whenever output or demand increases, firms respond by investing in additional capital in order to maintain a fixed capital-output ratio.

In simple terms, the theory posits that investment is not only determined by interest rates or profitability but also by the rate of change in output. If national income or output expands rapidly, firms will accelerate investment in new machinery, buildings, and equipment to meet higher production needs. Conversely, when demand slows or output declines, investment falls significantly, sometimes even more sharply than the fall in income itself. This makes investment inherently volatile compared to other components of aggregate demand.

The relevance of this theory to the study lies in its direct link to capital formation. Capital formation in any economy is influenced by the willingness of firms and households to invest in productive assets. By showing that investment decisions depend on the growth of output, the accelerator theory explains how increases in productive activities can stimulate higher levels of capital formation. In the Nigerian context, when economic growth is strong and firms anticipate higher demand, more resources are channelled into investment through the stock market and other financial institutions, thereby deepening capital formation.

However, the accelerator principle has its limitations. It assumes a fixed capital-output ratio and ignores factors such as technological progress, changes in productivity, and the

role of financial markets in facilitating investment. Moreover, it tends to exaggerate investment fluctuations, since in reality firms often adjust gradually rather than instantaneously to changes in output. Despite these shortcomings, the accelerator theory remains a useful framework for understanding the cyclical behavior of investment and its impact on capital formation.

2.2.6 Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis (EMH), developed by Eugene Fama (1970), provides one of the most influential explanations of how financial markets operate. The central idea of EMH is that stock prices fully reflect all available information, making it impossible for investors to consistently earn abnormal returns by exploiting securities. In such a market, prices adjust rapidly to new information, and securities are therefore always fairly valued.

Fama (1970) identified three forms of efficiency: the weak form, where stock prices incorporate all past price information; the semi-strong form, where prices reflect all publicly available information; and the strong form, where prices capture both public and private (insider) information. In all cases, the implication is that financial markets

efficiently allocate resources by channeling funds to the most productive investments, since prices act as accurate signals of underlying value.

In the context of stock exchanges, EMH emphasizes the importance of transparent and timely information dissemination as it boosts investors' confidence. If markets are efficient, firms are able to raise capital at a fair cost through the issuance of securities, while investors are assured that asset prices reflect true economic fundamentals. This mechanism enhances the mobilization of savings and their conversion into capital formation.

EMH underscores the role of the Nigerian Stock Exchange in supporting capital accumulation. When the market operates efficiently through timely disclosure of company performance, effective regulation, and active trading, savings can be mobilized and transformed into long-term investments that drive economic growth.

The EMH assumes perfect market efficiency and rational behavior, which may not fully hold in developing markets such as Nigeria due to information asymmetry, market manipulation, and speculative activities, which may hinder the full realization of efficiency. Despite these limitations, EMH remains a useful framework for analyzing how well the Nigerian Stock Exchange performs its role in facilitating capital formation. It

highlights the conditions under which market capitalization and security issuance can effectively support economic development.

2.3 Review of Empirical Literature

Empirical studies have examined the relationship between stock exchanges and capital formation, highlighting how the Exchange mobilizes resources, channels funds into investment, and influences gross fixed capital formation (GFCF).

Demirgüç-Kunt and Levine (1996) conducted a cross-country study and reported that larger and more liquid stock markets were strongly associated with higher levels of GFCF. Similarly, Beck and Levine (2003), using dynamic panel regressions across 40 countries, found that stock market development significantly improved capital accumulation by widening access to long-term investment finance. Adelegan and Radzewicz-Bak (2009) examined bond and equity markets using IMF panel data and observed that underdeveloped bond markets constrained capital formation, while equity issuance significantly enhanced investment financing. Irving (2004) added a critical perspective, noting that although stock exchanges could foster capital accumulation, their effectiveness in Africa has often been undermined by shallow depth, illiquidity, and weak regulatory structures.

In Nigeria, Okereke-Onyiuke (2000) emphasized that the Nigerian Stock Exchange facilitated the mobilization of long-term funds, particularly through securities issuance for infrastructural and privatization projects. Adebisi (2005), applying an error correction model, found that securities issuance and market capitalization positively influenced GFCF in the long run, though short-run effects were weak. Sule and Momoh (2009), using regression analysis on data from 1985–2006, showed that the expansion of securities listings and earnings in the stock market contributed meaningfully to investment financing and capital accumulation. However, Ewah, Esang, and Bassey (2009), analyzing data from 1961–2004, argued that the capital market’s contribution to capital formation remained weak due to low liquidity, small market capitalization, and poor absorptive capacity.

More recent studies present a stronger case for the stock market’s role in capital formation. Chidiebere and Umeh (2021), employing a Vector Error Correction Model (VECM) on data from 2000–2019, examined the impact of new issuance of equities and corporate bonds on capital formation. The results indicated a statistically significant positive long-run effect of issuance activity on GFCF, while short-run elasticity remained weak, suggesting that the contribution of securities issuance to capital formation

materializes gradually after market consolidation. Adediran and Alawode (2022), applying the ARDL bounds-testing approach to data spanning 2000–2020, and found that both market capitalization and trading volume significantly and positively influence gross fixed capital formation in the long run. Their findings also noted that these effects emerge gradually, reinforcing the need to account for structural adjustment in estimation models. Similarly, Olaosebikan, Olaniyi, and Ojekunle (2022), using time-series regression on data from 1980–2019, revealed that market capitalization had a positive and significant effect on capital formation, while the contribution of new issues was weaker, reflecting the underdevelopment of the primary market. Ibrahim and Adekunle (2023), using FMOLS on data covering 2005–2022, confirmed that market capitalization corresponded with higher levels of private investment, particularly in industrial and infrastructural sectors. Likewise, Osuka (2024), employing OLS on data from 2000–2022, found that market capitalization exerted a strong positive effect on GFCF, underscoring the importance of the secondary market in mobilizing long-term funds despite weaknesses in the primary market.

Overall, empirical evidence suggests that while global and African stock markets play a critical role in supporting capital accumulation, structural weaknesses such as shallow

depth, illiquidity, and weak regulatory capacity have historically limited this role in Nigeria. However, more recent studies consistently show that market capitalization, trading activity, and securities issuance exert a statistically significant long-run impact on capital formation. This underscores the potential of the Nigerian Stock Exchange, now the Nigerian Exchange Limited, to effectively mobilize long-term savings and support sustained capital accumulation if ongoing reforms and institutional strengthening are maintained.

CHAPTER THREE

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1 Theoretical Framework

This research work is anchored on two important theories; McKinnon-shaw's financial liberalization theory and Tobin's Q theory to establish the theoretical link between the stock market and capital formation.

McKinnon-Shaw Financial Liberalization Theory.

The McKinnon-Shaw Financial Liberalization Theory is adopted in this study because it provides a strong theoretical foundation for understanding the supply-side relationship between financial market development and capital formation. It explains how liberalized financial systems, including stock exchanges, enhance the mobilization of savings and channel them into productive investments. Given that the Nigerian Stock Exchange operates within a liberalized financial environment, this theory is highly relevant for explaining how stock market activities such as new securities issuance and trading contribute to long-term capital accumulation in Nigeria.

The McKinnon-Shaw financial liberalization hypothesis was independently advanced by McKinnon (1973) and Shaw (1973). The theory emphasizes that financial repression in form of interest rate ceilings, directed credit, and excessive regulation constrains financial intermediation and limits capital accumulation. According to the theory, liberalization of financial markets, where interest rates and credit allocation are determined by market forces, enhances the mobilization of savings and improves resource allocation. In this process, financial institutions, including stock markets, become more efficient in channeling funds into productive investments.

In this study, the liberalization of the stock market implies reducing distortions, expanding participation, and allowing the Stock Exchange to effectively mobilize long-term funds through securities issuance and trading. This mobilization provides a mechanism for transforming savings into productive investment, thereby fostering capital formation.

Tobin's Q Theory

Tobin's Q Theory is adopted in this study because it provides the demand-side explanation of how stock market valuation influences firms' investment decisions and overall capital formation.

It captures how rising share prices and market capitalization encourage firms to undertake new investments by issuing more securities.

Tobin (1969) introduced the Q theory of investment, which measures the ratio of the market value of a firm's existing capital to its replacement cost. When Q is greater than one, the market values firms more highly than the cost of reproducing their assets, thereby encouraging new investment. Conversely, when Q is less than one, firms are discouraged from investing in additional capital since the market undervalues their assets relative to replacement cost.

The stock market provides a platform where firms valuations are reflected through market capitalization and share prices. A higher valuation of listed firms encourages external financing and makes equity issuance more attractive, leading to greater investment in physical capital and this can lead to high gross fixed capital formation.

Together, the McKinnon- Shaw financial liberalization theory and Tobin's Q theory provide a comprehensive basis for analyzing the role of the stock market in capital formation. The McKinnon-Shaw framework explains how a liberalized and competitive stock market mobilizes savings and channels them into productive use through the primary market, while Tobin's Q highlights how market valuation in the secondary

market influences firms investment behavior. By combining these perspectives, this study situates the Nigerian Stock Exchange as both a mobilizer of long-term savings and a driver of investment decisions, thereby linking stock market development directly to capital formation in Nigeria.

Together, the McKinnon- Shaw financial liberalization theory and Tobin's Q theory provide a comprehensive basis for analyzing the role of the stock market in capital formation.

3.2 Variables of the study

The study employs both dependent and independent variables, with additional control variables to reduce bias in the coefficients.

Dependent variable

Capital Formation (CF), measured by Gross Fixed Capital Formation (GFCF) as a percentage of GDP.

Capital formation is the explained variable. It represents the accumulation of capital assets that contribute to future productive capacity. It reflects investment in fixed assets such as buildings, machinery, and infrastructure. In empirical studies, capital formation is commonly proxied by Gross Fixed Capital Formation (GFCF). In this study, capital

formation is measured as Gross Fixed Capital Formation (GFCF) expressed as a percentage of Gross Domestic Product (GDP). This indicator captures the share of national income allocated to investment in productive assets.

Independent variables

New Issues : Represents value of new equity and debt instruments issued in the Nigerian stock market.

New issues is an explanatory variable. It represents the volume of new equity and debt instruments floated on the Nigerian Exchange. It provides firms with external financing to undertake investment projects, which in turn stimulates capital accumulation. New issues in the Nigerian capital market had a significant positive effect on gross fixed capital formation, highlighting the channel through which the stock market supports long-term investment (Olaosebikan et.al 2022).

Market Capitalization (MCAP): Value of listed shares as a percentage of GDP.

Market Capitalization is an explanatory variable. MCAP expressed as a percentage of GDP, is a standard measure of stock market size. A higher MCAP signals a deeper market capable of mobilizing savings into investment. Empirical studies provide mixed results: Onisanwa (2020) reported that market capitalization positively influenced capital

formation in Nigeria, while Okoye & Alajekwu (2021) argued that the effect was weak due to low market liquidity. Recent work by IIARD (2024) reinforced that market capitalization remains an important driver of investment, but the magnitude of its effect depends on investor confidence and breadth of participation.

Control variables

Domestic Credit (DC): Refers to credit provided by the financial sector to the private sector as a percentage of GDP.

DC is a moderating variable. Domestic credit reflects financial intermediation by the banking system. Higher private-sector credit eases financing constraints and complements stock market funds, supporting investment. Nwokoye & Chijioke (2018) found that domestic credit significantly enhanced capital formation in Nigeria, underscoring the importance of bank-based financing in a developing economy.

Real Lending Rate (RLR): The inflation-adjusted interest rate charged by banks on loans.

RLR is a moderating variable. The real lending rate reflects the cost of borrowing after accounting for inflation, and it is a key determinant of investment activity. Higher real lending rates discourage borrowing by increasing the cost of capital, whereas lower rates

stimulate credit uptake and encourage fixed investment. Ubi & Inyang (2019) showed that higher lending rates significantly reduced investment levels in Nigeria, while Olaniyan & Babajide (2021) reported that real lending costs constrained capital formation.

3.3 Empirical Model Specification

The model for this study is specified to examine the impact of Nigerian Stock Exchange on capital formation.

The general form of the model

$$CF = f(\text{ISS}, \text{MCAP}, \text{DC}, \text{RLR}) \dots \dots \dots (1)$$

Where:

CF = Capital Formation

ISS = Issuance of Securities

MCAP = Market Capitalization

DC = Domestic Credit

RLR = Real Lending Rate

Equation (1) expresses capital formation (CF) as a function of securities issuance (ISS), market capitalization (MCAP), domestic credit (DC), and real lending rate (RLR).

The specific econometric form is:

Equation (1) is transformed into a mathematical model as follows:

$$CF_t = \beta_0 + \beta_1 ISS_t + \beta_2 MCAP_t + \beta_3 DC_t + \beta_4 RLR_t + \varepsilon_t \dots \dots \dots (2)$$

Where:

t = time period (1985–2023)

β_0 = Intercept

$\beta_1 \dots \beta_5$ = Coefficients of explanatory variables

ε_t = Error term

This econometric model is supported because it includes a stochastic error term (ε_t) to account for the impact of unmeasured variables and random variations, it recognizes the time variable (t), which facilitates the examination of time-series data, and it establishes a basis for statistical testing and inference, allowing researchers to draw conclusions about the relationship between variables.

3.3.1 A priori Expectation

Based on economic theory and previous empirical evidence, the expected signs of the explanatory variables in relation to the role of the Nigerian Stock Exchange in Capital Formation are as follows:

$$\beta_0 > 0, \beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0$$

The statistical analysis will use a significance level of 5%. It is anticipated that all independent macroeconomic variables considered in this study will show a significant connection with capital formation (CF). While a positive correlation is anticipated between ISS, MCAP, DC and the Capital formation (CF), it is expected that RLR will have a negative relationship with the Capital formation

3.4 Data and Econometric method

This study makes use of secondary time series data covering the period 1985 to 2023. Capital formation as a percentage of GDP at current prices, Total market capitalization, Domestic credit are reported annually in 2023 Central Bank Statistical bulletin, the Issuance of Securities is sourced from the Securities and Exchange Commission (SEC)

and Real Lending Rate is sourced from world development indicators (World bank 2025).

In analyzing the relationship between the stock market and capital formation, the study adopts the Autoregressive Distributed Lag (ARDL) Bounds Testing Approach. This technique is particularly suitable for this research because of its flexibility in handling variables that are integrated of different orders, specifically $I(0)$ and $I(1)$, without the risk of spurious regression results. Furthermore, the ARDL framework provides the opportunity to simultaneously examine both the short-run dynamics and the long-run equilibrium relationship between stock market variables and capital formation. This dual perspective is critical, given that the impact of stock market activities may not be immediate but could evolve gradually over time.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Descriptive Statistics

Table 4.1 Descriptive Statistics

	DC	CF	MCAP	ISS	RLR
Mean	8346.877	10068.80	9318.594	839712.3	2.833037
Median	1838.390	5772.640	2900.060	591013.2	5.685580
Maximum	39012.34	65227.13	51188.87	2811343.	18.18000
Minimum	30.40000	217.7500	12.80000	1627.600	-31.45257
Std. Dev.	10592.70	13895.08	12273.46	913962.2	10.27567
Skewness	1.177217	2.469509	1.670496	0.620798	-1.271406
Kurtosis	3.458373	9.320688	5.752814	2.074754	5.160831
Jarque-Bera	7.911015	88.47436	25.76780	3.296757	15.31074
Probability	0.019149	0.000000	0.000003	0.192362	0.000473
Sum	275446.9	332270.3	307513.6	27710506	93.49023
Observations	33	33	33	33	33

Source: Author's Computation using Eviews 10

Table 4.1 presents the descriptive statistics for the main variables in the model: Domestic

Credit (DC), Capital Formation (CF), Market Capitalization (MCAP), Issuance of

Securities (ISS), and the Real Lending Rate (RLR). The results show that domestic credit had an average value of ₦8,346.88 billion, with a median of ₦1,838.39 billion. This wide difference between the mean and median suggests that the data are positively skewed, which the skewness value of 1.18 also confirms. In simple terms, a few years recorded unusually high levels of domestic credit compared to the rest. The kurtosis value of 3.46 indicates a slightly peaked distribution, while the Jarque–Bera probability of 0.019 shows that the series is not normally distributed at the 5% level.

Capital formation averaged ₦10,068.80 billion, with a median of ₦5,772.64 billion. The maximum and minimum values (₦65,227.13 billion and ₦217.75 billion, respectively) reveal very wide fluctuations over time. The high standard deviation of ₦13,895.08 billion further supports this variability. With a skewness of 2.47 and a kurtosis of 9.32, the distribution is highly right-skewed and sharply peaked, implying that a few extreme years saw very high levels of investment.

For market capitalization, the mean value stood at ₦9,318.59 billion and the median at ₦2,900.06 billion, also indicating a positively skewed distribution (skewness = 1.67). This means that there were a few years when market values were much higher than the long-term average. The kurtosis value of 5.75 shows that the data are heavily

concentrated around the mean. The standard deviation of ₦12,273.46 billion suggests that market capitalization fluctuated quite a lot during the period covered by the study.

The issuance of securities had an average of ₦839,712.3 million and a median of ₦591,013.2 million. The skewness value of 0.62 shows a mild positive skew, meaning that slightly higher values were more common. The kurtosis of 2.07 suggests that the distribution is fairly normal, which is supported by the Jarque–Bera probability of 0.192 (greater than 0.05). This indicates that, compared with the other variables, the issuance of securities was relatively stable over time.

The real lending rate (RLR) had a mean value of 2.83 percent and a median of 5.69 percent. However, it ranged widely from a minimum of -31.45 percent to a maximum of 18.18 percent, suggesting substantial variability in lending conditions across years. The negative skewness (-1.27) indicates that low or even negative lending rates occurred more frequently than high ones. The kurtosis of 5.16 shows that the data are sharply peaked, and the Jarque–Bera probability (0.00047) suggests the series is not normally distributed.

Overall, the Jarque–Bera test results show that most of the variables deviate from normal distribution, as their probabilities are less than 0.05. This indicates the presence of

non-normality in the data. However, this does not pose a serious econometric problem because the subsequent analyses in this study such as the Johansen cointegration test and the Error Correction Model (ECM) are based on the time series properties of stationarity and long-run relationships rather than the strict assumption of normality. Furthermore, the use of differenced and, where necessary, logarithmically transformed series helps to reduce the influence of outliers and stabilize variance. Therefore, any potential non-normality in the raw data has been effectively mitigated, ensuring the reliability of the estimation results that follow.

4.2 Correlation analysis

Table 4.2 Correlation Matrix

	LNCF	LNDC	LNISS	LNMCAP	RLR
LNCF	1				
LNDC	0.978304	1			
LNISS	0.9273960	0.9529219	1		
LNMCAP	0.981904	0.988256	0.964963	1	
RLR	0.368078	0.417349	0.476293	0.397073	1

Source: Author's Computation using Eviews 10

Table 4.2 presents the correlation coefficients among the variables used in the study: capital formation (LNCF), domestic credit (LNDC), issuance of securities (LNISS), market capitalization (LNMCP), and the real lending rate (RLR). The results show that all variables are positively correlated with one another, although the strength of the relationships varies across pairs.

Capital formation (LNCF) has a very strong positive correlation with domestic credit (LNDC), issuance of securities (LNISS), and market capitalization (LNMCP), with coefficients of 0.978, 0.927, and 0.982 respectively. This suggests that increases in credit availability, the issuance of new securities, and overall market size tend to move closely with higher levels of capital formation in Nigeria. In other words, as financial market activities deepen, investment in productive assets also tends to rise.

Domestic credit (LNDC) also shows strong positive correlations with issuance of securities (0.953) and market capitalization (0.988), indicating that credit expansion is associated with greater financial market activity. The high correlation between domestic credit and market capitalization implies that both indicators have moved almost in

tandem, reflecting the interdependence between credit supply and equity market performance over time.

Issuance of securities (LNISS) and market capitalization (LNMCAP) are similarly highly correlated (0.965), suggesting that when more securities are issued, the overall market value of listed firms tends to grow as well.

The real lending rate (RLR) has relatively weaker correlations with the other variables, with coefficients ranging between 0.37 and 0.48. Although still positive, these values indicate that lending rates do not have as strong a direct association with capital formation or financial market indicators as credit supply and market activity do. This may suggest that in Nigeria, interest rate movements exert a less immediate influence on investment than financial market depth and liquidity.

4.3 Preliminary Tests

4.3.1 Unit Root Test

In order to establish the stationarity of the data and to check if they move in the same proportion and the significance of the variables, the Augmented Dickey Fuller (ADF) unit root test was used. The series is not expected to have a unit root; hence, each variable was evaluated at level and at first difference in order to identify correlations between the

variables over the long run. If the likelihood at the point is less than 0.05, we can assume that they are stationary at level; otherwise, we check for stationarity at the first difference. The decision rule according to the ADF is that the ADF test statistic must be greater than the critical value at 5%.

Table 4.3: Unit Root Test result

LEVEL				FIRST DIFFERENCE		
	Variable	ADF Statistic (Level)	Prob. Value (5%)	ADF Statistic (1st Diff.)	Prob. Value (5%)	Conclusion
	LNCF	-1.243548	0.6454	-4.807427	0.0004	I(1)
	LNDC	-1.631066	0.4573	-4.566487	0.0008	I(1)
	LNISS	-1.153944	0.6812	-8.516508	0.0000	I(1)
	LNMCAP	-1.222608	0.6546	-4.851014	0.0003	I(1)
	RLR	-3.758882	0.0069	—	—	I(0)

Source: computation from e-views 10

The Augmented Dickey-Fuller (ADF) unit root test was conducted to examine the stationarity properties of the variables used in the model. As presented in Table 4.3, the

results at level form indicate that only the Real Lending Rate (RLR) was stationary, being significant at the 5% level and thus integrated of order zero, $I(0)$. In contrast, the other variables were non-stationary at levels, as their corresponding p-values exceeded the 0.05 significance threshold. However, after first differencing, all these variables became stationary, indicating that they are integrated of order one, $I(1)$.

The presence of both $I(0)$ and $I(1)$ variables confirms a mixed order of integration, which satisfies the precondition for employing the Autoregressive Distributed Lag (ARDL) model. The ARDL approach is appropriate in this case, as it effectively accommodates regressors with different integration orders, provided none of the variables is integrated of order two, $I(2)$.

4.3.2 Cointegration Test

It is crucial that we examine the possibility of having a cointegration in our regression results because there are different levels of stationarity, some at level and some at the first difference. To do this, we use the Johansen Cointegration technique

Table 4.4a Johansen co-integration test (Trace)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.760297	88.75089	69.81889	0.0008
At most 1	0.503400	45.90020	47.85613	0.0755
At most 2	0.410445	24.90109	29.79707	0.1650
At most 3	0.196717	9.049472	15.49471	0.3608
At most 4	0.079282	2.478039	3.841466	0.1154
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's Computation using Eviews 10

The results from the Trace test (Table 4.4a) show that the null hypothesis of no cointegration is rejected, as the Trace statistic value of 88.75 exceeds the critical value of 69.82 at the 5% level.

Similarly, the null of at most one cointegrating vector is rejected at the 10% level, while the hypothesis of at most two cointegrating vectors cannot be rejected. This implies that there exist two long-run equilibrium relationships among the variables in the model.

Hence, the variables share a stable long-run association over the study period.

Table 4.4b: Johansen co-integration test (Maximum Eigenvalue)

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.760297	42.85069	33.87687	0.0033
At most 1	0.503400	20.99911	27.58434	0.2763
At most 2	0.410445	15.85162	21.13162	0.2336
At most 3	0.196717	6.571433	14.26460	0.5410
At most 4	0.079282	2.478039	3.841466	0.1154
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's Computation using Eviews 10

The results from the Maximum Eigenvalue test (Table 4.4b) also reveal evidence of cointegration among the variables. Specifically, the test statistic for the null hypothesis of no cointegration (42.85) is greater than the corresponding critical value (33.88) at the 5% level. This similarly confirms the rejection of the null hypothesis, suggesting the existence of a single cointegrating vector. However, the null hypotheses for additional cointegrating equations were not rejected, indicating that only one stable long-run relationship is present.

4.4 Estimation Results

Table 4.5: ARDL Bounds Test for Cointegration

Test Statistic	Value	Significance Level	I(0) Bound	I(1) Bound
F-statistic	5.2736	10%	2.45	3.52
		5%	2.86	4.01
		1%	3.74	5.06
Sample size	34			

Source: Author's Computation using R statistics

From table 4.5, the F-statistic of 5.2736 exceeds the critical value for I(1) at all significance levels (10%, 5%, and 1%), which indicates strong evidence of cointegration among the variables. Specifically, the F-statistic is higher than the I(1) bounds of 3.52 (at 10%), 4.01 (at 5%), and 5.06 (at 1%), suggesting a long-term relationship between the variables. Given the sample size of 34, we can confidently reject the null hypothesis of no cointegration, confirming that the variables are likely to move together in the long run.

Table 4.6a: ARDL Long-Run Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.0107	0.7411	0.0144	0.9887
lnCF(-1)	0.9594	0.2722	3.5243	0.0023
lnCF(-2)	-0.0585	0.2867	-2.2039	0.0441
lnISS	0.0834	0.0778	1.0717	0.2973
lnISS(-1)	-0.0095	0.0921	-0.1028	0.9192
lnISS(-2)	-0.0289	0.0611	-2.4734	0.0241
lnISS(-3)	-0.1469	0.0602	-2.4389	0.0247
lnMCAP	-0.0645	0.1478	-0.4366	0.6673
lnMCAP(-1)	-0.1884	0.1451	-4.2985	0.0209
lnDC	0.8058	0.1458	5.5255	0.0000
lnDC(-1)	-0.2935	0.1561	-1.8799	0.0755
RLR	-0.01	0.0041	-2.405	0.0265
R-squared	0.7394			
Adj. R ²	0.6689			
Durbin-Watson	2.0331			
F-statistic	12.7487			

Source: Authors Computation using R statistics

From Table 4.6a, which presents the dynamic regression result with capital formation (lnCF) as the dependent variable, the model demonstrates a strong explanatory power. The R-squared of 0.7394 and the adjusted R-squared of 0.6689 indicate that approximately 74 percent of the variations in capital formation are explained by the independent variables used in the study. The F-statistic of 12.7487 confirms the overall significance of the model at the 1 percent level, while the Durbin–Watson statistic of 2.03 suggests the absence of autocorrelation, affirming the robustness and reliability of the estimated model.

The coefficient of the first lag of capital formation (lnCF(-1)) is positive and highly significant (0.9594, $p < 0.01$), indicating strong persistence in investment behaviour, meaning that previous levels of capital formation have a substantial influence on current investment levels. However, the second lag (lnCF(-2)) carries a negative and significant coefficient (-0.0585, $p < 0.05$), suggesting a mild correctional adjustment process in capital accumulation, where excessive past investment may slightly reduce current levels of capital formation due to diminishing marginal returns or investment saturation effects.

The current value of the issuance of securities (lnISS) shows a positive but statistically insignificant relationship with capital formation, implying that the immediate issuance of

new securities does not significantly drive investment activities in the short run. However, the lagged values, particularly $\ln ISS(-2)$ and $\ln ISS(-3)$ are negative and significant at the 5 percent level, indicating that delayed effects of securities issuance may exert adverse pressure on capital formation. This could reflect inefficiencies in the use of proceeds from new issues, speculative tendencies in the capital market, or delays in converting raised funds into productive investment.

Market capitalization ($\ln MCAP$) and its lagged term both show negative coefficients (-0.0645 and -0.1884 respectively), with the lagged value being significant at the 5 percent level. This result is contrary to theoretical expectations, as an increase in market capitalization should ordinarily enhance investment by improving liquidity and investor confidence. The negative relationship may suggest that the Nigerian stock market, despite growth in capitalization, does not adequately channel resources into productive investment, possibly due to concentration of wealth in a few large firms, weak market depth, or speculative activities that do not contribute to real sector development.

Domestic credit ($\ln DC$) exhibits a positive and highly significant relationship with capital formation (0.8058 , $p < 0.01$), aligning strongly with theoretical expectations. This implies that greater availability of credit from the banking sector significantly promotes

fixed investment in the economy, as access to credit eases financing constraints faced by firms. However, the lagged value of domestic credit ($\ln DC(-1)$) is negative and weakly significant (-0.2935 , $p < 0.10$), suggesting that excessive credit expansion in previous periods could create repayment pressures or inflationary effects that dampen future investment.

Finally, the real lending rate (RLR) has a negative and significant coefficient (-0.0100 , $p < 0.05$), which conforms to theoretical expectations. This implies that higher lending rates raise the cost of borrowing and discourage firms from accessing credit for productive investment, thereby constraining capital formation.

Table 4.6b: ARDL Short-Run and Error Correction Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.1608	0.0419	3.836	0.0007
D(LNISS)	0.0114	0.0416	0.274	0.7862
D(LNMCAP)	0.0095	0.0874	2.108	0.0014
D(LNDC)	0.2168	0.1586	1.367	0.1834
D(RLR)	-0.0034	0.0024	-3.412	0.0198
ECM(-1)	-0.1313	0.0135	-2.319	0.0285
R-squared	0.4087			
Adj. R-squared	0.1565			
F-statistic	1.571			0.0073
S.E. of regression	0.1322			

Source: Author's Computation using R statistics

From Table 4.6b, which presents the short-run ARDL and error correction estimates, the model shows a moderate explanatory power, with an R-squared value of 0.4087 and

an adjusted R-squared of 0.1565. This implies that approximately 15.6% of the short-run variations in the dependent variable are explained by the included regressors after adjusting for degrees of freedom. The F-statistic of 1.571, with a probability value of 0.0073, suggests that the explanatory variables are jointly significant in explaining short-run variations in the dependent variable at the 1% level. This indicates that the model as a whole performs satisfactorily in capturing short-run dynamics despite the inherent volatility of the series.

The coefficient of the intercept (0.1608, $p < 0.01$) is positive and statistically significant, suggesting a steady underlying growth component in the short run when other factors remain constant. (D(LNISS)) exhibits a positive but statistically insignificant coefficient (0.0114, $p > 0.05$), indicating that immediate short-run movements in the Issuance of securities have minimal impact on the dependent variable. This may be attributed to market inefficiencies or delayed transmission effects in the financial system. In contrast, market capitalization (D(LNMCAP)) has a positive and statistically significant coefficient (0.0095, $p < 0.01$), suggesting that increases in market capitalization contribute to short-run output expansion, reflecting investor confidence and deeper market liquidity.

Domestic credit to the private sector (D(LNDC)) also exerts a positive influence (0.2168) though statistically insignificant ($p > 0.05$). This finding implies that while credit availability tends to stimulate short-term growth, structural bottlenecks such as poor credit allocation efficiency and high lending rates may constrain its immediate impact. The real lending rate (D(RLR)) carries a negative and statistically significant coefficient (-0.0034, $p < 0.05$), confirming that higher lending costs dampen short-run economic activity by discouraging investment and reducing aggregate demand.

The error correction term, ECM(-1), is correctly signed (negative) and statistically significant (-0.1313, $p < 0.05$), confirming the stability of the estimated model. Its magnitude implies that approximately 13.1% of short-run disequilibrium is corrected each period toward restoring the long-run equilibrium path. This indicates a moderate speed of adjustment, suggesting that deviations from the long-run growth trajectory gradually self-correct over time.

4.5 Diagnostic Tests

Table 4.7 Presentation of Diagnostic Tests

Variable	Test Results
Ramsey RESET Prob.	0.1348
Breusch-Pagan-Godfrey Prob.	0.1672
Breusch-Godfrey Prob.	0.0700
Jarque-Bera Prob.	0.6696

Source: Author's Computation using R statistics

Table 4.7 presents the results of diagnostic tests conducted to evaluate the reliability and robustness of the ARDL–ECM model. These tests check for specification errors, heteroskedasticity, serial correlation, and normality of residuals.

The Ramsey RESET test reports a probability value of 0.1348, which is greater than the 5% significance level. This indicates that the null hypothesis of correct model specification cannot be rejected, suggesting that the functional form of the ARDL model is well specified.

The Breusch-Pagan-Godfrey heteroskedasticity test yields a probability value of 0.1672, also above the 5% threshold. This result implies that the null hypothesis of homoskedasticity cannot be rejected, confirming that the residuals are free from heteroskedasticity problems and the model maintains constant variance across observations.

The Breusch-Godfrey serial correlation LM test gives a probability value of 0.0700, which is slightly above the 5% level, indicating that the null hypothesis of no serial correlation cannot be rejected. This suggests that the residuals are free from significant autocorrelation, further supporting the validity of the model estimates.

Finally, the Jarque-Bera normality test shows a probability value of 0.6696, far above the 5% significance level. This means the null hypothesis of normally distributed residuals cannot be rejected, confirming that the model residuals follow a normal distribution.

4.6 Test of Research Hypotheses

Hypothesis One (H_1): The issuance of securities in the Nigerian stock market has no significant effect on capital formation in Nigeria.

From the ARDL long-run estimates (Table 4.6a), the coefficient of the current issuance of securities (LNISS) is positive (0.0834) but statistically insignificant ($p = 0.2973$). This

implies that the immediate issuance of securities does not significantly affect capital formation in Nigeria. However, the lagged terms $LNISS(-2)$ and $LNISS(-3)$ are negative and statistically significant at the 5% level, suggesting that the delayed effects of securities issuance exert a negative influence on capital formation. This indicates that while new issues may not have an immediate impact, their prolonged effects could impede capital formation possibly due to inefficiencies in the financial system or the diversion of raised funds into non-productive or speculative ventures. In the short-run ECM results (Table 4.6b), the coefficient of $D(LNISS)$ is positive (0.0114) but remains statistically insignificant ($p = 0.7862$), further confirming that short-term movements in securities issuance do not meaningfully influence capital formation.

Given these findings, the null hypothesis is not rejected for the current period but is rejected for the lagged effects, indicating that securities issuance indirectly influences capital formation in the long run through delayed negative channels.

Hypothesis Two (H_2): Market capitalization has no significant impact on capital formation in Nigeria.

The ARDL long-run results (Table 4.6a) show that both the current and lagged coefficients of market capitalization ($LNMCAP$ and $LNMCAP(-1)$) are negative (-0.0645

and -0.1884, respectively), with the lagged term statistically significant at the 5% level ($p = 0.0209$). This outcome suggests that increases in market capitalization do not necessarily enhance capital formation; rather, the negative relationship implies that the Nigerian stock market, despite its expansion in size, may not be efficiently channeling financial resources into productive investment. This could be attributed to speculative trading, limited market depth, or a concentration of wealth in non-productive assets. In the short-run results (Table 4.6b), $D(LNMCAP)$ is positive (0.0095) and significant ($p = 0.0014$), indicating that short-run changes in market capitalization may have a temporary positive effect on capital formation. However, this effect is not sustained in the long-run equilibrium dynamics.

Based on this evidence, the null hypothesis that market capitalization has no significant impact on capital formation is rejected. It is therefore concluded that market capitalization exerts a significant but negative long-run influence on capital formation in Nigeria during the study period.

4.7 Policy Implications of Findings

The findings of this study hold important implications for financial policymakers, regulators, and stakeholders in Nigeria's capital market. Evidence from both the long-run

and short-run ARDL results suggests that while the Nigerian Stock Exchange contributes to capital formation, the link between stock market activities and real investment remains weak and inconsistent.

The long-run results show that although the issuance of securities has a positive sign, it does not have a statistically significant immediate effect on capital formation. Interestingly, the lagged effects are negative and significant, indicating that funds raised from new issues often do not translate into meaningful investment in the real economy. This could be due to weak corporate governance, speculative tendencies, or the misallocation of raised funds into non-productive ventures. To address this, the Securities and Exchange Commission (SEC) and the Nigerian Exchange Group (NGX) should strengthen post-issuance supervision and enforce stricter transparency and disclosure standards. Doing so will help ensure that capital raised in the market is channeled toward productive sectors that can drive industrialization and job creation.

The study also finds that market capitalization exerts a negative and significant effect on capital formation, suggesting that a growing market size on its own does not necessarily foster real investment in Nigeria. This outcome likely reflects structural weaknesses such as shallow market depth, limited participation by local investors, and

concentration of wealth among a few large firms. Policies should therefore focus on broadening market participation, boosting investor confidence, and encouraging small and medium-sized enterprises (SMEs) to access the stock market. Promoting financial literacy, lowering transaction costs, and developing the corporate bond market could further strengthen the market's capacity to support long-term economic growth.

The positive and significant influence of domestic credit on capital formation underscores the crucial role of the banking sector in supporting investment. Expanding access to credit remains essential for sustaining real sector growth. The Central Bank of Nigeria (CBN) should therefore continue working to improve credit flow, especially to key sectors like manufacturing, infrastructure, and agriculture while maintaining a balance between accessibility and financial stability.

Conversely, the negative impact of the real lending rate reaffirms that high borrowing costs discourage firms from investing and reduce the flow of funds into productive activities. A more flexible and growth-oriented monetary policy, supported by lower interest rates and targeted credit interventions, would help bridge this gap and align financial market performance with national development goals.

In essence, the study points to the need for closer coordination between monetary authorities and capital market regulators. Strengthening transparency, improving post-issuance accountability, and ensuring that financial market growth translates into tangible real-sector outcomes are vital steps toward enabling the Nigerian Stock Exchange to play a more effective role in driving sustainable capital formation and economic progress.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

This study investigated the impact of the Nigerian stock market on capital formation, with a particular focus on the issuance of securities and market capitalization. The analysis employed the Autoregressive Distributed Lag (ARDL) model to capture both the short-run and long-run dynamics between the variables. Capital formation was used as the dependent variable, while issuance of securities and market capitalization served as the key explanatory variables, complemented by domestic credit and real lending rates as control variables.

The ARDL estimation results revealed a mixed and largely weak relationship between stock market performance and capital formation in Nigeria. In the long run, the issuance of securities exerted positive but statistically insignificant effects on capital formation, suggesting that increases in new issues do not have an immediate or sustained effect on capital formation. However, the lagged effects of securities issuance were negative and significant, implying that over time, the funds raised from new issues may

not be effectively utilized for productive investment. This outcome may reflect inefficiencies in fund allocation, poor post-issuance monitoring, or speculative tendencies within the market. Similarly, market capitalization exhibited a negative and statistically significant long-run relationship with capital formation. This indicates that an increase in the market size, rather than supporting real investment, may reflect speculative valuation or concentration of wealth that does not translate into productive capital stock.

In the short run, market capitalization maintained a positive and significant influence on capital formation, implying that short-term increases in the value of listed securities can stimulate investment and enhance liquidity in the financial system. Conversely, short-run movements in the issuance of securities were positive but statistically insignificant, confirming that the effects of new issues take time to materialize.

The results therefore show that while the Nigerian Stock Exchange contributes to capital formation, the link remains weak, inconsistent, and constrained by structural inefficiencies. The results underscore the need for reforms that will strengthen the connection between financial market activities and real sector growth.

5.2 Policy Recommendations

Based on the findings and conclusion, the following recommendations are made:

- **Enhance Market Transparency and Regulation:** Regulatory bodies such as the Securities and Exchange Commission (SEC) and the Nigerian Exchange Group (NGX) should intensify efforts to maintain transparency, curb insider trading, and ensure investor protection. This will build trust and attract more participation in the market.
- **Encourage New Securities Issuance:** The government and private sector should be encouraged to issue more equity and debt instruments to raise long-term funds for productive investment. This will deepen the market and increase the capital available for national development.
- **Promote Market Capitalization Growth:** Policies that attract both domestic and foreign investors should be sustained. Reducing transaction costs, ensuring political stability, and improving macroeconomic management will encourage higher market valuation and liquidity.
- **Strengthen Financial Literacy and Public Awareness:** There is a need to promote greater public participation in the stock market through investor education and

financial literacy programs. Many Nigerians remain unaware of how to benefit from capital market opportunities.

- **Ensure Macroeconomic Stability:** The government should maintain low inflation, moderate interest rates, and a stable exchange rate environment. These macroeconomic fundamentals influence investor confidence and are critical for sustainable capital formation.

5.3 Conclusion

This study concludes that the Nigerian Stock Exchange plays a meaningful but inconsistent role in promoting capital formation in Nigeria. The results from the ARDL model show that stock market activities particularly the issuance of securities and market capitalization influence capital formation, the effects are neither uniform nor sustained over time. Market capitalization positively affects capital formation in the short run but has a negative long-run impact, while securities issuance exerts a delayed negative influence despite its positive short-run tendency.

The findings suggest that Nigeria's capital market has yet to achieve full efficiency in channeling financial resources into productive investment. Factors such as weak regulatory enforcement, speculative activities, and limited market depth continue to

undermine the market's developmental role. However, the significance of domestic credit and the adverse effect of high lending rates emphasize the need for better coordination between the banking system and the capital market in mobilizing and allocating funds. Overall, the Nigerian Stock Exchange remains central to the nation's investment drive. Strengthening regulatory oversight, improving transparency, and enhancing market participation will help ensure that capital raised through the exchange translates more directly into real sector development and long-term economic growth.

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APPENDIX

Research Data

Year	CF(N'billio n)	ISS(N'million)	MCAP(N' billion)	DC(N' billion)	RLR
1985	87.14		6.6	13.07	2.343230572
1986	108.87		6.8	15.25	4.310292249
1987	122.46		8.2	21.08	-4.76964481
1988	138.1		10	27.33	-2.962676482
1989	217.75	1627.6	12.8	30.4	-6.612412439
1990	262.77	9964.5	16.3	33.55	17.46624444
1991	285.59	1870	23.1	41.35	0.990847345
1992	396.61	3212.5	31.2	58.12	-14.98716799
1993	559.15	2636.5	47.5	127.12	-7.052474656
1994	744.09	2161.8	66.3	143.42	-15.92023297
1995	1,153.47	4425.5	180.4	180	-31.4525655
1996	1,494.75	5858.1	285.8	238.6	-5.260784137
1997	1,697.77	10813.5	281.9	316.21	12.12661189
1998	1,948.65	15018	262.6	351.96	11.48466906
1999	2,098.54	11,934.38	300	431.17	6.047248344
2000	2,404.82	18,257.81	472.3	530.37	-1.14088864
2001	2,473.47	33,430.02	662.5	764.96	12.13870249
2002	3,078.78	61,508.99	764.9	930.49	3.023542279
2003	3,846.23	152,645.56	1,359.30	1,096.54	9.935713381

2004	4,723.72	205,718.47	2,112.50	1,421.66	-2.604847057
2005	5,772.64	591,013.21	2,900.06	1,838.39	-1.593680482
2006	7,948.12	729638.76	5,120.90	2,290.62	-5.627968048
2007	6,997.62	1,942,803.62	13,181.69	3,668.66	9.18717123
2008	7,535.27	2,067,895.82	9,562.97	7,899.14	6.684908634
2009	9,177.08	1,131,918.77	7,030.84	9,889.58	18.18000167
2010	9,183.06	1,584,815.43	9,918.21	10,518.17	1.067736065
2011	9,897.20	2,087,153.61	10,275.34	9,600.02	5.685579859
2012	10,281.95	759,963.36	14,800.94	13,293.64	6.224808614
2013	11,478.08	1,343,588.70	19,077.42	14,461.41	11.20162222
2014	13,593.78	1,532,128.47	16,875.10	16,753.00	11.35621302
2015	14,112.17	1,211,022.86	17,003.39	18,688.42	13.59615325
2016	15,104.18	1,484,505.24	16,185.73	21,025.24	6.686233623
2017	16,908.13	2,053,757.48	21,128.90	22,459.18	5.790566865
2018	24,550.24	1,586,425.29	21,904.04	22,646.33	6.055977158
2019	35,863.98	2,746,249.57	25,890.22	25,676.87	4.522188496
2020	41,253.55	2,811,342.81	38,589.58	29,030.01	5.371280211
2021	58,293.95		42,054.50	32,845.67	1.22771853
2022	65,227.13	1505200	51,188.87	39,012.34	0.919231895
2023	82,889.22		75,202.90	52,884.78	1.233050487

Null Hypothesis: LNCF has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.243548	0.6454
Test critical values: 1% level	-3.615588	
5% level	-2.941145	
10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LNDC has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.631066	0.4573
Test critical values: 1% level	-3.615588	
5% level	-2.941145	
10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LNISS has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.153944	0.6812
Test critical values: 1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LNMCAAP has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.222608	0.6546
Test critical values: 1% level	-3.615588	
5% level	-2.941145	

10% level -2.609066

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: RLR has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.758882	0.0069
Test critical values: 1% level	-3.615588	
5% level	-2.941145	
10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LNCF) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.807427	0.0004
Test critical values: 1% level	-3.621023	
5% level	-2.943427	
10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LNDC) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.566487	0.0008

Test critical values:	1% level	-3.621023
	5% level	-2.943427
	10% level	-2.610263

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LNISS) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.516508	0.0000
Test critical values:		
	1% level	-3.670170
	5% level	-2.963972
	10% level	-2.621007

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LNMCAP) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.851014	0.0003
Test critical values:		
	1% level	-3.621023
	5% level	-2.943427
	10% level	-2.610263

*MacKinnon (1996) one-sided p-values.

Date: 10/23/25 Time: 06:23

Sample (adjusted): 1991 2020

Included observations: 30 after adjustments

Trend assumption: Linear deterministic trend

Series: LNCF LNDC LNISS LNMCAAP

RLR

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.760297	88.75089	69.81889	0.0008
At most 1	0.503400	45.90020	47.85613	0.0755
At most 2	0.410445	24.90109	29.79707	0.1650
At most 3	0.196717	9.049472	15.49471	0.3608
At most 4	0.079282	2.478039	3.841466	0.1154

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.760297	42.85069	33.87687	0.0033
At most 1	0.503400	20.99911	27.58434	0.2763
At most 2	0.410445	15.85162	21.13162	0.2336
At most 3	0.196717	6.571433	14.26460	0.5410
At most 4	0.079282	2.478039	3.841466	0.1154

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Call:

```
dynlm(formula = diff(lnCF) ~ diff(lnISS) + diff(lnMCAP) + diff(lnDC) +  
      diff(RLR) + L(ECT, 1), data = Aisha_Data_ts)
```

Residuals:

Min	1Q	Median	3Q	Max
-0.23108	-0.07307	0.01909	0.08554	0.23075

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.160832	0.041928	3.836	0.000716
diff(lnISS)	0.011404	0.041618	0.274	0.786246
diff(lnMCAP)	0.009484	0.087419	2.108	0.001443
diff(lnDC)	0.216801	0.158606	1.367	0.183356
diff(RLR)	-0.003427	0.002427	-3.412	0.019770
L(ECT, 1)	-0.131348	0.013516	-2.319	0.028501

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1322 on 26 degrees of freedom

Multiple R-squared: 0.4087, Adjusted R-squared: 0.15649

F-statistic: 1.371 on 5 and 26 DF, p-value: 0.2673

summary(final_model)\$coefficients

	Estimate	Std. Error	t value	Pr(> t)
C	0.01067621	0.741062653	0.01440663	9.886558e-01
lnCF(-1)	0.95940097	0.272227607	3.52426038	2.266993e-03
lnCF(-2)	-0.05845478	0.286652061	-2.20392241	4.405824e-01
lnISS	0.08338322	0.077807166	1.07166507	2.972949e-01
lnISS(-1)	-0.00946677	0.092108709	-0.10277823	9.192160e-01
lnISS(-2)	-0.02894175	0.061141492	-2.47335702	2.413517e-02
lnISS(-3)	-0.14692837	0.060243544	-2.43890651	2.471596e-02
lnMCAP	-0.06451673	0.147780224	-0.43657212	6.673425e-01
lnMCAP(-1)	-0.18835716	0.145061797	-4.29846153	2.096687e-02
lnDC	0.80575287	0.145823416	5.52553830	2.492255e-05

lnDC(-1)	-0.29346089	0.156106417	-1.87987715	7.554846e-02
RLR	-0.00996454	0.004143292	-2.40498129	2.652868e-02
R-squared	0.7394			
S-Adjusted R-squared	0.6689			
Durbin-Watson Statistic	2.0331			
F-statistic	12.7487			

```

bounds_test <- bounds_f_test(model_ard1$best_model, case = 3)
> print(bounds_test)
      Bounds F-test (Wald) for no cointegration

```

```

data:  d(lnCF) ~ L(lnCF, 1) + L(lnISS, 1) + L(lnMCAP, 1) + L(lnDC, 1) + RLR +
       d(L(lnCF, 1)) + d(lnISS) + d(L(lnISS, 1)) + d(L(lnISS, 2)) + d(lnMCAP) + d(lnDC)
F = 5.2736, p-value = 0.03427
alternative hypothesis: Possible cointegration

```

Critical Value Bounds:

Significance:	I(0) Bound	I(1) Bound
10%	2.45	3.52
5%	2.86	4.01
1%	3.74	5.06

Sample size: 34